April 24, 2020

TO: INTERESTED PARTIES

RE: Daley Farms of Lewiston, LLP – 2018 Dairy Expansion Project

The Minnesota Pollution Control Agency (MPCA) has made two final decisions regarding the Environmental Assessment Worksheet (EAW) and the State of Minnesota Individual Animal Feedlot National Pollution Discharge Elimination System Permit MN0067652 (Individual NPDES Feedlot Permit) for the Daley Farms of Lewiston, LLP – 2018 Dairy Expansion Project.

1. The MPCA issues the Findings of Fact, Conclusions of Law, and Order for a Negative Declaration on the need for an Environmental Impact Statement (EIS) on the Daley Farms of Lewiston, LLC – 2018 Dairy expansion project, Winona County. The Findings of Fact, Conclusions of Law, and Order document concludes that this project does not have the potential for significant environmental effects. The decision for a Negative Declaration on the need for an EIS completes the state environmental review process under the revised Environmental Quality Board rules, Minn. R. ch. 4410. Final governmental decisions on the granting of permits or approvals for the project may now be made.

2. The MPCA is also issuing the Findings of Fact, Conclusions of Law, and Order to deny the request for a Contested Case Hearing on the issuance of coverage under the Individual NPDES Feedlot Permit for Daley Farms of Lewiston, LLP.

We want to express our appreciation for all comments submitted on the Supplemental EAW and the Individual NPDES Feedlot Permit. Comments and responses to them have been incorporated into the Findings of Fact, Conclusions of Law, and Order and have been considered by MPCA staff during the permit and environmental review processes for the proposed project.

Please note that in an effort to slow the spread of Covid 19, the Governor has required the MPCA to work remotely when possible and has closed public libraries. When these locations are back open to the public, the Daley Farms documents may be viewed at: the MPCA offices in St. Paul; the Minneapolis Public Library at 300 Nicollet Mall, Minneapolis; and the Rochester Public Library at 101 Second Street SE.

Mailing of this document will be delayed due to MPCA staff working remotely, and to save on printing resources, the mailing will not include the many comments on the Supplemental EAW. However, the complete document is available on the MPCA website at https://www.pca.state.mn.us/regulations/projects-under-mpca-review. Requests for copies of the Daley Farms documents may be made by contacting the St. Paul office at 651-757-2100.

Sincerely,

Laura Bishop
Commissioner

LB/KG:bt
In a decision issued October 14, 2019, the Minnesota Court of Appeals reversed and remanded the January 4, 2019, Findings of Fact, Conclusions of Law, and Order (2019 Findings) for a negative declaration on the need for an Environmental Impact Statement (EIS) for the proposed Daley Farms of Lewiston, LLP – 2018 Dairy Expansion due to a failure to consider potential significant environmental effects from greenhouse gases (GHGs). The Minnesota Pollution Control Agency (MPCA) thereafter prepared and distributed a supplement to the October 1, 2018, Environmental Assessment Worksheet (2018 EAW). The January 21, 2020, Supplemental Environmental Assessment Worksheet (Supplemental EAW) addresses only GHG emissions related to the Project. Based on the MPCA environmental review of the 2018 EAW, Supplemental EAW, comments and information received during the comment periods, and other information in the record of the MPCA, the MPCA hereby makes the following Supplemental Findings of Fact, Conclusion of Law, and Order (Supplemental Findings). This Supplemental Findings adds to the 2019 Findings, which is incorporated herein by reference and which remains relevant and applicable to the Project. The 2019 Findings are available upon request and online at https://www.pca.state.mn.us/regulations/projects-under-mpca-review.

SUPPLEMENTAL FINDINGS OF FACT

Project Description

1. Daley Farms of Lewiston, LLP (Daley) proposes to expand its existing dairy feedlot in Section 16 of Utica Township, Winona County (Project). The existing feedlot consists of three sites, regulated under the State of Minnesota Individual Animal Feedlot National Pollution Discharge Elimination System (NPDES) Permit # MN0067652 (Individual NPDES Feedlot Permit).
   - LLP site, a 1,996.4 animal unit (AU) total confinement barns
   - LLP1 site, a 140 AU partial confinement barn and concrete lot without runoff control
   - LLP7 site, a 138.8 AU partial confinement barn and concrete lot without runoff control

2. Daley is ineligible for the State of Minnesota General Animal Feedlot NPDES Permit because the existing feedlot does not currently comply with the surface water effluent limitation requirements of Code of Federal Regulations, Title 40, Section 412. Therefore, Daley has applied to modify its Individual NPDES Feedlot Permit, and the Project will be regulated under the Individual NPDES Feedlot Permit. Daley will come into compliance with the federal regulation under a Schedule of Compliance that is incorporated into the Individual NPDES Feedlot Permit.
3. The Project consists of the following items at the LLP site.
   - Adding a cross-vented, total confinement freestall barn with 3,000 dairy cows
   - Eliminating 525 dairy cows and adding 525 heifers to the existing barns
   - Adding a liquid manure storage area
   - Adding stormwater basins to collect the new barn stormwater runoff
   - Adding a rotary milking parlor with a holding area
   - Adding a sand processing and storage building
   - Adding an animal mortality building
   - Adding a feed storage pad
   - Adding a basin to collect feed storage pad stormwater runoff
   - Installing two livestock wells

4. The Project also consists of eliminating the LLP1 site, and adding open-lot runoff controls at the LLP7 site. Daley will add open-lot runoff controls, required to eliminate runoff from animal lots in order to create zero discharge from LLP7 site, in accordance with the Individual NPDES Feedlot Permit Schedule of Compliance and federal regulation.

5. The Project would result in the feedlot increasing from 2,275.2 AU to 5,967.7 AU.

6. The Project would generate approximately 46.2 million gallons of manure annually, and 1.7 million gallons of runoff annually from the feed storage pad.

7. Daley will land apply the manure on its own fields, and fields owned by third parties who have entered into agreements with Daley.

8. Daley will hire a commercial animal waste technician to land apply manure to cropland according to the MPCA approved Manure Management Plan (MMP).


10. Daley plans to construct the Project once environmental review is complete, and all necessary permits and approvals are granted.

Environmental Review of Project

11. An EAW is a brief document designed to provide the basic facts necessary for the Responsible Governmental Unit (RGU) to determine whether an EIS is required for a proposed project or to initiate the scoping process for an EIS (Minn. R. 4410.0200, subp. 24). The MPCA is the RGU for this Project.

12. In 1997, the MPCA prepared an EAW for Daley’s then proposed expansion, a consolidation of milking operations and retirement of older facilities. The MPCA issued a negative declaration on the need for an EIS on September 22, 1997.

13. Minn. R. 4410.4300, subp. 29(B) required preparation of an EAW for the Project because it is the construction of an animal feedlot facility with a capacity of 500 AUs or more located in a sensitive location.


15. The MPCA provided public notice of the Project as follows:
   a. The Environmental Quality Board (EQB) published the notice of availability of the 2018 EAW for public comment in the EQB Monitor on October 1, 2018, as required by Minn. R. 4410.1500.
   b. The 2018 EAW was available for review on the MPCA website at: http://www.pca.state.mn.us/news/eaw/index.html.
c. The MPCA provided a news release to media in Minnesota and other interested parties on October 1, 2018.
d. Daley’s draft Individual NPDES Feedlot Permit was open for public comment on October 1, 2018.
e. On October 11, 2018, the MPCA extended both the 2018 EAW and the Individual NPDES Feedlot Permit comment period until November 15, 2018.
f. The MPCA provided a news release to the media in Minnesota and other interested parties on October 12, 2018, announcing the extension of the public comment periods.
g. The EQB announced the extension of the public comment period in the EQB Monitor on October 22, 2018.
h. On October 16, 2018, the MPCA held a public informational meeting at the Lewiston Community Center.

16. During the 45-day comment period ending on November 15, 2018, the MPCA received 615 comment letters on the 2018 EAW and the Individual NPDES Feedlot Permit. The MPCA also received 6 late comment letters after November 15, 2018; these late comment letters did not include any new information.

17. The MPCA issued a Findings of Fact, Conclusions of Law, and Order for a negative declaration on the need for an EIS on January 4, 2019.

18. The list of the comments received during the 45-day public comment ending on November 15, 2018, were included as Appendix A to the 2019 Findings.

19. The MPCA prepared written responses to the comments received during the 45-day public comment ending on November 15, 2018, included as Appendix B to the 2019 Findings.

20. The MPCA prepared an errata sheet to correct errors in the 2018 EAW, included as Appendix C to the 2019 Findings.

21. On February 1, 2019, the Minnesota Center for Environmental Advocacy (MCEA) and the Land Stewardship Project filed an appeal challenging the MPCA’s January 4, 2019, decision on the need for an EIS and approval of the Individual NPDES Feedlot Permit modification.

22. On October 14, 2019, the Minnesota Court of Appeals released an unpublished decision reversing and remanding the MPCA’s EIS order because the agency failed to consider potential significant environmental effects from GHGs. The court also invalidated the MPCA’s approval of the Individual NPDES Feedlot Permit modification because a determination on whether an EIS is needed must precede a decision to approve a permit modification.

Supplemental Environmental Review of Project

23. Following the October 14, 2019, court decision, the MPCA prepared a Supplemental EAW that evaluated GHG emissions related to the Project (which is also the focus of this Supplemental Findings).
   a. The MPCA provided public notice of the Supplemental EAW as follows:
   b. The EQB published the notice of availability of the Supplemental EAW for public comment in the EQB Monitor on January 21, 2020, as required by Minn. R. 4410.1500.
   c. The Supplemental EAW was available for review on the MPCA website at: http://www.pca.state.mn.us/news/eaw/index.html.
   d. The MPCA provided a news release to media in Minnesota and other interested parties on January 22, 2020.
   e. Daley’s draft Individual NPDES Feedlot Permit was opened for public comment on January 21, 2020.
f. After receiving a request for a 30-day public notice extension from MCEA, on January 30, 2020, the MPCA extended both the Supplemental EAW and Individual NPDES Feedlot Permit comment periods an additional 15 days until March 6, 2020.

g. The MPCA provided a news release to the media in Minnesota and other interested parties on February 4, 2020, announcing the extension of the public comment periods.

h. The EQB announced the extension of the public comment period in the *EQB Monitor* on February 10, 2020.

i. On February 4, 2020, the MPCA held a public informational meeting at the Lewiston Community Center.

24. During the 45-day comment period ending on March 6, 2020, the MPCA received 550 comment letters on the Supplemental EAW.

25. The list of comments received during the 45-day public comment period ending on March 6, 2020, are included as Appendix D to these Supplemental Findings. To avoid confusion with the 618 comment letters received on the 2018 EAW, each Supplemental EAW comment letter was given a number starting with 619.

26. The MPCA prepared written responses to the comments received during the 45-day public comment period ending on March 6, 2020. For comments that were similar to those made on the 2018 EAW, the MPCA makes reference to the January 4, 2019, responses to comments. For new comments, the MPCA responses are included as Appendix E to these Supplemental Findings.

27. The MPCA prepared an errata sheet to correct errors in the Supplemental EAW, notably a calculation error of nitrous oxide from manure application, and the replacement of “flatulence” with “enteric fermentation.” The errata sheet is included as Appendix F to these Supplemental Findings.

Criteria for Determining the Potential for Significant Environmental Effects

28. The MPCA shall base its decision on the need for an EIS on the information gathered during the EAW process and the comments received on the EAW (Minn. R. 4410.1700, subp. 3). The MPCA must order an EIS for projects that have the potential for significant environmental effects (Minn. R. 4410.1700, subp. 1). In deciding whether a project has the potential for significant environmental effects, the MPCA must compare the impacts that may be reasonably expected to occur from the Project with the criteria set forth in Minn. R. 4410.1700, subp. 7. These criteria are:

- Type, extent, and reversibility of environmental effects.
- Cumulative potential effects. The RGU shall consider the following factors: whether the cumulative potential effect is significant; whether the contribution from the project is significant when viewed in connection with other contributions to the cumulative potential effect; the degree to which the project complies with approved mitigation measures specifically designed to address the cumulative potential effect; and the efforts of the project proposer to minimize the contributions from the project.
- The extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority. The RGU may rely only on mitigation measures that are specific and that can be reasonably expected to effectively mitigate the identified environmental impacts of the project.
- The extent to which environmental effects are anticipated and controlled as a result of other available environmental studies undertaken by public agencies or project proposer, including other EISs.
The MPCA Findings with Respect to Each of These Criteria Are Set Forth Below

Type, Extent, and Reversibility of Environmental Effects

29. The first criterion that the MPCA must consider when determining if a project has the potential for significant environmental effects is the “type, extent, and reversibility of environmental effects” Minn. R. 4410.1700, subp. 7(A). The MPCA findings with respect to this criterion as applied to the Project’s GHG emissions are set forth below.

30. The MPCA considered GHG emissions sources that are within the scope of the Project.

31. The primary GHG emissions from dairy operations are: a) methane (CH₄) from manure storage and feed digestive releases from the cows themselves, and b) nitrous oxide (N₂O) from manure storage and the land application of manure.

32. The Project will directly release GHG emissions, which have the ability to widely disperse within the atmosphere and which vary both in terms of their global warming potential and their persistence in the atmosphere.

33. To provide a common unit of measure, the MPCA uses the individual global warming potential of methane and nitrous oxide to convert to carbon dioxide equivalency (CO₂e).

34. Using U.S. Environmental Protection Agency (EPA) emission factors, the MPCA estimates that after Project construction (thus including both existing operation and the new expansion) the Daley facility will release approximately 34,400 tons of CO₂e annually from manure storage, feed digestive releases from the cows themselves, and the land application of manure.

35. The Project also includes activities, such as agricultural best management practices like planting cover crops or converting fields from row crops to alfalfa that sequester GHG emissions. Daley anticipates 850 acres of alfalfa would be needed for the Project, and the MPCA estimates a reduction of 1,000 tons of CO₂e per year if the alfalfa comes from fields currently planted in row crop agriculture. The MPCA did not include these GHG emission reductions in the Project’s GHG emission calculation because they are not required by the Individual NPDES Feedlot Permit or other regulation.

36. There are no Minnesota or National Ambient Air Quality Standards for GHGs.

37. At this time, there are no federal or Minnesota thresholds of GHG significance for determining impacts of GHG emissions from an individual project on global climate change.

38. In the absence of a threshold of GHG significance, the MPCA looks to existing regulation. Minn. R. 4410.4300, subp 15 Part B, establishes a mandatory category requiring preparation of an EAW for stationary source facilities generating 100,000 tons per year (TPY) of GHGs. The purpose of an EAW is to assess environmental effects associated with a proposed project to aid in the determination of whether an EIS is needed. On the premise of GHG emissions environmental review regulations establish 100,000 TPY as a “trigger” to prepare an EAW to aid in determining potential significant environmental effects. A reasonable conclusion is that the Project’s GHG emissions at well below 100,000 TPY are not considered significant.
39. The EQB is currently engaging in a process to develop guidance for the assessment of GHG emissions in the Minnesota Environmental Review process; this guidance is not yet available for consideration.

40. The MPCA finds the Project, as proposed, does not have the potential for significant environmental effects based on the type, extent, and reversibility of impacts related to the Project’s GHG emissions that are reasonably expected to occur.

Cumulative Potential Effects

41. The second criterion that the MPCA must consider when determining if a project has the potential for significant environmental effects is the “cumulative potential effects.” In making this determination, the MPCA must consider “whether the cumulative potential effect is significant; whether the contribution from the project is significant when viewed in connection with other contributions to the cumulative potential effect; the degree to which the project complies with approved mitigation measures specifically designed to address the cumulative potential effects; and the efforts of project proposer to minimize the contributions from the project.” Minn. R. 4410.1700, subp. 7(B). The MPCA findings for this criterion as applied to the Project’s GHG emissions are set forth below.

42. Global climate change results from the total accumulation of GHG emissions in the Earth’s atmosphere, as well as other man-made and natural factors. The GHG composition of the Earth’s atmosphere is changing and causing the planet’s climate to change.

43. While it may be possible to model the effects of the incremental GHG emissions associated with the project (e.g., a social cost of carbon estimate based on a modeling framework that considers the social cost of each marginal ton of CO2e), as a matter of empirical observation, it would be impossible to ‘see’ the effects signal observationally amidst the internal noise of the global climate system. In other words, the available models might be used, and the results of those models might be extrapolated to give MPCA some idea of physical impacts caused by the amount of GHGs emitted from the Project. However, significant uncertainty would remain, especially as to when and where the physical impacts might occur.

44. It is not within the current state of the science to provide an analysis of the impact the Project-related GHG emissions will have on the environment.

45. It would be unreasonable to order an EIS because it is impossible to know whether and when reliable data will become available and any study of cumulative impacts of GHGs would necessarily go well beyond evaluating the impacts solely from the Project.

46. The information on Project impacts that might be developed from the modeling cannot be reasonably obtained as required for an EAW (Minn. R. 4410.1700, subp. 2a).

47. There are no Minnesota or National Ambient Air Quality Standards for GHGs.

48. The EQB is currently engaging in a process to develop guidance for the assessment of GHG emissions in the Minnesota Environmental Review process; this guidance is not yet available for consideration.

49. The MPCA finds the Project, as proposed, does not have the potential for significant environmental effects related to cumulative potential effects based on the Project’s GHG emissions that are reasonably expected to occur.
The Extent to Which the Environmental Effects Are Subject to Mitigation by Ongoing Public Regulatory Authority

50. The third criterion that the MPCA must consider when determining if a project has the potential for significant environmental effects is "the extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority. The RGU may rely only on mitigation measures that are specific and that can be reasonably expected to effectively mitigate the identified environmental impacts of the project." Minn. R. 4410.1700, subp. 7.C. The MPCA Findings for this criterion as applied to the Project’s GHG emissions are set forth below.

51. To address nitrate surface and groundwater quality concerns, Daley agreed to comply with special Individual NPDES Feedlot Permit conditions, beyond what is required in feedlot rules. Daley will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the Minnesota Department of Agriculture (MDA) soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by thermometer at a depth of 6 inches.

2. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.

3. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by soil temperature taken by thermometer at a depth of 6 inches.

4. Planting/seeding a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Applying manure in the spring.

6. Split-applying nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoiding application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 or 6.

52. If employed, special conditions numbers 2, 4, and 6 listed in the previous finding will offset some of the GHG emissions generated from the Project by either removing carbon from the atmosphere and sequestering it in the soil, or reducing the formation of methane or nitrous oxide.

53. The Individual NPDES Feedlot Permit for the Project requires land application of manure, which replaces nutrients that farmers would likely obtain from chemical fertilizers, thereby avoiding GHG emissions associated with chemical fertilizer production.

54. As the Minnesota delegated Clean Water Act authority, the MPCA has a robust, established feedlot permit enforcement program that is responsible for enforcing individual NPDES feedlot permits in
partnership with county feedlot programs. The EPA regularly audits MPCA’s enforcement programs for compliance with Clean Water Act requirements to maintain delegation.

55. The Project would create demand for alfalfa to feed the cows, which likely would be met through the conversion of row crop fields to alfalfa fields. The MPCA estimates for each acre converted there is 1.21 tons CO$_2$e avoided annually.

56. There are no state or federal air quality or performance standards for GHGs, or other regulatory requirements that would prescribe limits to GHG emissions from feedlots. If standards are established in the future that apply to Daley it will be required to comply with them. Upon reissuance, the Individual NPDES Feedlot Permit would be modified, or another type of permit required to include future applicable requirements.

57. The MPCA finds the Project, as proposed, does not have the potential for significant environmental effects due to GHG emissions even without the mitigation measures discussed above. The MPCA additionally finds that this Project is subject to mitigation by ongoing public regulatory authority through mitigation requirements in the Project’s Individual Feedlot Permit, and those mitigation measures further reduce the potential for significant environmental effects due to GHG emissions. The mitigation measures included in the Project’s Individual Feedlot Permit are specific and can be reasonably expected to effectively mitigate the identified environmental impacts of the Project.

The Extent to Which Environmental Effects can be Anticipated and Controlled as a Result of Other Available Environmental Studies Undertaken by Public Agencies or the Project, Including Other EISs

58. The fourth criterion that the MPCA must consider is “the extent to which environmental effects can be anticipated and controlled as a result of other available environmental studies undertaken by public agencies or the project proposer, including other EISs,” Minn. R. 4410.1700, subp. 7.D. The MPCA Findings with respect to the Project’s GHG emissions are set forth below.

59. The MPCA reviewed the following documents as part of the GHG environmental impact analysis for the Project: U.S. Government’s U.S. Greenhouse Gas Emissions and Sinks: 1990-2016 (2018); MPCA’s legislative report Greenhouse gas emissions in Minnesota: 1990-2016 (2019); MPCA’s report Greenhouse gas reduction potential of agricultural best management practices (2019); The Center for Climate Strategies in Collaboration with Minnesota State Agencies’ report Minnesota Climate Strategies and Economic Opportunities (2016); data presented in the 2018 EAW and Supplemental EAW, Individual NPDES Feedlot Permit application, with MMP and attachments; and permits and environmental review of similar projects.

60. The MPCA also relied on information provided by Daley, persons commenting on the 2018 EAW and Supplemental EAW, staff experience, and other available information obtained by staff.

61. The environmental effects of the Project have been addressed by the design and Individual NPDES Feedlot Permit development processes, and state and local permit and plan requirements and approvals by ensuring conformance with regional and local plans. No elements of the Project pose the potential for significant environmental effects.

62. Based on the environmental review, previous environmental studies by public agencies or Daley, and staff expertise and experience on similar projects, the MPCA finds that the environmental effects of the Project that are reasonably expected to occur can be anticipated and controlled.

63. The MPCA adopts the rationale stated in the attached Responses to Comments (Appendix E) as the basis for response to any issues not specifically addressed in these Supplemental Findings.
CONCLUSIONS OF LAW

64. The MPCA has jurisdiction in determining the need for an EIS for this Project. The 2018 EAW, Supplemental EAW, the Individual NPDES Feedlot Permit development process, and the evidence in the record are adequate to support a reasoned decision regarding the potential for significant environmental effects that are reasonably expected to occur from this Project.

65. The MPCA identified areas for potentially significant environmental effects. The Project design and permits ensure that Daley will take appropriate mitigation measures to address significant effects.

66. The MPCA expects the Project to comply with all environmental rules, regulations, and standards.

67. Based on a comparison of the impacts that are reasonably expected to occur from the Project with the criteria established in Minn. R. 4410.1700, subp. 7, the Project does not have the potential for significant environmental effects.

68. An EIS is not required for the proposed Daley Farms of Lewiston, LLP - 2018 Dairy Expansion.

69. Any Findings that might properly be termed conclusions and any conclusions that might properly be termed Findings are hereby adopted as such.

ORDER

70. The Minnesota Pollution Control Agency determines that there are no potentially significant environmental effects reasonably expected to occur from the Daley Farms of Lewiston, LLP - 2018 Dairy Expansion and that there is no need for an Environmental Impact Statement.

IT IS SO ORDERED

____________________________
Laura Bishop, Commissioner
Minnesota Pollution Control Agency

4/24/2020

Date
January 4, 2019

TO: INTERESTED PARTIES

RE: Daley Farms of Lewiston, LLP – 2018 Dairy Expansion

The Minnesota Pollution Control Agency (MPCA) has approved the Findings of Fact, Conclusions of Law, and Order for a Negative Declaration on the need for an Environmental Impact Statement on the proposed Daley Farms of Lewiston, LLP – 2018 Dairy expansion project, Winona County. The Findings of Fact, Conclusions of Law, and Order document concludes that this project does not have the potential for significant environmental effects. The decision for a Negative Declaration completes the state environmental review process under the revised Environmental Quality Board rules, Minn. R. ch. 4410. Final governmental decisions on the granting of permits or approvals for the project may now be made.

The MPCA has also approved the Findings of Fact, Conclusions of Law, and Order to deny the request for a Contested Case Hearing on the issuance of coverage under the State of Minnesota Individual Animal Feedlot National Pollution Discharge Elimination System Permit MN0067652 (Individual NPDES Feedlot Permit) for Daley Farms of Lewiston, LLP.

These documents can be reviewed at the following locations: the MPCA offices in St. Paul; the Minneapolis Public Library at 300 Nicollet Mall, Minneapolis; and the Rochester Public Library at 101 Second Street SE. The document can be viewed on our MPCA website at www.pca.state.mn.us/eaw. Requests for copies of these documents may be made by contacting the St. Paul office at 651-757-2100.

Also, enclosed is a copy of my letter to the MN Environmental Quality Board (EQB) recommending a Generic Environmental Impact Statement for the karst area of southeastern Minnesota. This area suffers from existing groundwater contamination that pollutes existing and future drinking water wells.

We want to express our appreciation for comments submitted on the Environmental Assessment Worksheet and the Individual NPDES Feedlot Permit. Comments and responses to them have been incorporated into the Findings of Fact, Conclusions of Law, and Order and have been considered by MPCA staff during the permit process for the proposed project.

Please note that the mailed packet will not include the comment letters since the volume of comment letters is so large. However, all of the comment letters will be included in the packet posted on the MPCA website, https://www.pca.state.mn.us/quick-links/projects-under-m pca-review.

Sincerely,

John Linc Stine
Commissioner

JS:bt
January 4, 2019

David Frederickson, Chair
Minnesota Environmental Quality Board
625 Robert Street North
St. Paul, MN 55155

Dear Chair Frederickson:

In follow-up to our discussion at the December 19, 2018, Minnesota Environmental Quality Board (EQB) meeting, I am formally requesting that the EQB order a generic environmental impact statement (EIS) under Minn. Rules pt. 4410.3800, subp. 3 to study and address nitrate pollution of groundwater in the geologically sensitive karst region of southeastern Minnesota.

As you know, the karst region is particularly susceptible to rapid seepage of contaminants from the land and overlying soils, making the groundwater of this region very vulnerable to contamination. The Minnesota Department of Health (MDH) and the Minnesota Department of Agriculture (MDA) together have extensive data documenting nitrate contamination of public and private drinking water wells. In particular, data recently compiled via the MDA Township Testing Program have found numerous townships in the karst region with private wells at or above the 10 milligrams per liter health risk limit for nitrate.

Nitrate in drinking water can pose a health risk to people, especially infants and the elderly. It is important to have a sound understanding of the sources of nitrate contamination of groundwater in order to properly minimize and manage potential impacts. However, this issue of nitrate contamination is bigger than any one project or site, and merits a generic EIS.

A generic EIS can help Minnesota citizens, businesses, and decision-makers better understand the nature, extent and sources of the nitrate contamination. This will provide insight into the actions needed to address the existing contamination that is the cumulative effect of current practices and activities, as well as inform the review of new projects. Such a generic EIS could be scoped to focus on the sensitive karst region of Minnesota, or could be expanded to include all areas with data showing nitrate contamination of groundwater.

I understand that completing such an EIS will require time and resources. While a decision is pending on a generic EIS, and while a generic EIS is underway if one is ordered, project-specific environmental review will continue as required by Minn. Rules pt. 4410.3800, subpts 8 and 9. The MPCA will continue to work with project proposers within our authority to mitigate potential impacts from new or expanding projects. At the same time, I strongly urge EQB to pursue a generic EIS as noted above, to provide the additional information needed to take a more holistic view of this significant problem, and to help Minnesota to go beyond mitigating the impact of new projects to also better address the existing nitrate contamination that already threatens human health and our environment.

Sincerely,

John Linc Stine
Commissioner

cc: Will Seuffert, EQB Executive Director
Pursuant to Minn. R. ch. 4410.1000, the Minnesota Pollution Control Agency (MPCA) staff prepared and distributed an Environmental Assessment Worksheet (EAW) for the proposed Daley Farms of Lewiston, LLP – 2018 Dairy Expansion. Based on the MPCA staff environmental review, comments, and information received during the comment period, and other information in the record of the MPCA, the MPCA hereby makes the following Findings of Fact, Conclusions of Law, and Order.

FINDINGS OF FACT

Project Description

1. Daley Farms of Lewiston, LLP (Daley) proposes to expand its existing dairy feedlot in Section 16 of Utica Township, Winona County (Project). The existing feedlot consists of three sites, regulated under the State of Minnesota Individual Animal Feedlot National Pollution Discharge Elimination System (NPDES) Permit MN0067652 (Individual NPDES Feedlot Permit).
   - LLP site, a 1,996.4 animal unit (AU) total confinement barns
   - LLP1 site, a 140 AU partial confinement barn and concrete lot without runoff control
   - LLP7 site, a 138.8 AU partial confinement barn and concrete lot without runoff control

2. Daley is ineligible for the State of Minnesota General Animal Feedlot National Pollution Discharge Elimination System Permit because the feedlot does not currently comply with the surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412. Therefore, Daley has applied to modify its Individual NPDES Feedlot Permit, and the Project will be regulated under the Individual NPDES Feedlot Permit. Daley will come into compliance with the federal regulation under a Schedule of Compliance that is incorporated into the Individual NPDES Feedlot Permit.

3. The Project consists of the following items at the LLP site.
   - Adding a cross-vented, total confinement freestall barn with 3,000 dairy cows
   - Eliminating 525 dairy cows and adding 525 heifers to the existing barns
   - Adding a liquid manure storage area (LMSA)
   - Adding stormwater basins to collect the new barn stormwater runoff
   - Adding a rotary milking parlor with a holding area
   - Adding a sand processing and storage building
   - Adding an animal mortality building
   - Adding a feed storage pad
   - Adding a basin to collect feed storage pad stormwater runoff
   - Installing two livestock wells
4. The Project also consists of eliminating the LLP1 site, and adding open-lot runoff controls at the LLP7 site. Daley will add open-lot runoff controls, required to eliminate runoff from animal lots in order to create zero discharge from LLP7 site, in accordance with the Individual NPDES Feedlot Permit Schedule of Compliance.

5. The Project would result in the feedlot increasing from 2,275.2 AU to 5,967.7 AU.

6. The Project would generate approximately 46.2 million gallons of manure annually, and 1.7 million gallons of runoff from the feed storage pad.

7. Daley will land apply the manure on its own fields, and fields owned by third parties who have entered into agreements with Daley.

8. Daley will hire a commercial animal waste technician (CAWT) to land apply manure to cropland according to the MPCA approved manure management plan (MMP).


10. Daley plans to construct the Project once environmental review is complete, and all necessary permits and approvals are granted.

Environmental Review of Project

11. An EAW is a brief document designed to provide the basic facts necessary for the Responsible Governmental Unit (RGU) to determine whether an Environmental Impact Statement (EIS) is required for a proposed project or to initiate the scoping process for an EIS (Minn. R. 4410.0200, subp. 24). The MPCA is the RGU for this Project.

12. In 1997, the MPCA prepared an EAW for Daley’s then proposed expansion, a consolidation of milking operations and retirement of older facilities. The MPCA issued a negative declaration on the need for an EIS on September 22, 1997.

13. Minn. R. 4410.4300, subp. 29(B) requires preparation of an EAW for the Project because it is the construction of an animal feedlot facility with a capacity of 500 AU’s or more located in a sensitive location.


15. The MPCA provided public notice of the Project as follows:
   a. The Environmental Quality Board (EQB) published the notice of availability of the EAW for public comment in the EQB Monitor on October 1, 2018, as required by Minn. R. 4410.1500.
   b. The EAW was available for review on the MPCA website at: [http://www.pca.state.mn.us/news/eaw/index.html](http://www.pca.state.mn.us/news/eaw/index.html).
   c. The MPCA provided a news release to media in Minnesota and other interested parties on October 1, 2018.
   d. Daley’s draft Individual NPDES Feedlot Permit was open for public comment on October 1, 2018.
   e. On October 11, 2018, the MPCA extended both the EAW and Individual NPDES Feedlot Permit comment period until November 15, 2018.
f. The MPCA provided a news release to the media in Minnesota and other interested parties on October 12, 2018, announcing the extension of the public comment periods.

g. The EBQ announced the extension of the public comment period in the EQB Monitor on October 22, 2018.

16. During the 45-day comment period ending on November 15, 2018, the MPCA received 615 comment letters on the EAW and the Individual NPDES Feedlot Permit. The MPCA also received six late comment letters after November 15, 2018; these late comment letters did not include any new information.

17. The list of the comments received during the 45-day public comment period are included as Appendix A to these Findings.

18. The MPCA prepared written responses to the comments received during the 45-day public comment period. These responses are included as Appendix B to these Findings.

Criteria for Determining the Potential for Significant Environmental Effects

19. The MPCA shall base its decision on the need for an EIS on the information gathered during the EAW process and the comments received on the EAW (Minn. R. 4410.1700, subp. 3). The MPCA must order an EIS for projects that have the potential for significant environmental effects (Minn. R. 4410.1700, subp. 1). In deciding whether a project has the potential for significant environmental effects, the MPCA must compare the impacts that may be reasonably expected to occur from the Project with the criteria set forth in Minn. R. 4410.1700, subp. 7. These criteria are:

- Type, extent, and reversibility of environmental effects.

- Cumulative potential effects. The RGU shall consider the following factors: whether the cumulative potential effect is significant; whether the contribution from the project is significant when viewed in connection with other contributions to the cumulative potential effect; the degree to which the project complies with approved mitigation measures specifically designed to address the cumulative potential effect; and the efforts of project proposer to minimize the contributions from the project.

- The extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority. The RGU may rely only on mitigation measures that are specific and that can be reasonably expected to effectively mitigate the identified environmental impacts of the project.

- The extent to which environmental effects are anticipated and controlled as a result of other available environmental studies undertaken by public agencies or project proposer, including other EISs.
The MPCA Findings with Respect to Each of These Criteria
Are Set Forth Below

Type, Extent, and Reversibility of Environmental Effects

20. The first criterion that the MPCA must consider when determining if a project has the potential for significant environmental effects is the “type, extent, and reversibility of environmental effects” Minn. R. 4410.1700, subp. 7(A). The MPCA findings with respect to this criterion are set forth below.

21. The types of impacts that are reasonably expected to occur from the Project include the following

- Surface water and groundwater quality
- Groundwater appropriation
- Air quality - related to hydrogen sulfide, ammonia, and odor emissions

22. Written comments received during the EAW and Individual NPDES Feedlot Permit comment period raised additional issues

- Non-compliance at existing Daley operations
- Karst geology concerns
- Winona County animal unit cap

23. With respect to the type, extent and reversibility of impacts that are reasonably expected to occur from the Project, the MPCA makes the following findings.

Surface Water and Groundwater Quality

24. Minn. R. pt. 7020.2003, subp. 1 requires feedlots to have no discharge to natural or constructed channels that convey fluids to groundwater.

25. Minn. R. pt. 7020.2003, supb. 2 requires feedlots (CAFO’s or feedlots with 1,000 animal units or more) to comply with surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412, and discharge only as authorized by an NPDES permit.

26. The existing LLP site does not comply with the surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412, and is currently operating under an Individual NPDES permit for addressing the portion of the feedlot (small part of feed pad runoff collection) that is not meeting the requirements. In addition to expansion at the site, Daley will construct/install runoff control measures for the portion of the existing feedlot that is currently not meeting effluent limitation requirements. Upon completion of the Project, existing and proposed feedlot components will meet effluent limitation requirements.

27. The existing feedlot at the LLP1 site does not meet surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412. If Daley receives all permits and approvals for the proposed Project, Daley will close the LLP1 site. If Daley is unable to receive all needed permits and approvals, Daley will continue to operate the LLP1 site. And, in accordance to the Individual NPDES Feedlot Permit Schedule of Compliance, Daley will construct open-lot runoff controls to create a compliant feedlot meeting surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412.
28. The existing feedlot at the LLP7 site does not meet surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412. However, in accordance to Individual NPDES Feedlot Permit Schedule of Compliance, Daley will construct open-lot runoff controls at the LLP7 site to create a feedlot meeting surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412.

29. The Individual NPDES Feedlot Permit requires that all animals at the feedlot have no access to Waters of the State; manure storage occur in a dual-lined (concrete/high-density polyethylene (HDPE) and earthen) LMSA that meets the design criteria of Minn. R. 7020.2100; and all permanent manure stockpile sites meet the requirements of Minn. R. 7020.2125.

30. The Individual NPDES Feedlot Permit requires Daley to develop and maintain on-site a stormwater pollution prevention plan for the Project that includes erosion prevention and sediment control best management practices for the construction and operation of the Project.

31. The Project will include more than 1 acre of new impervious surface. Therefore Daley is required to install permanent stormwater treatment. Daley will install stormwater filtration basins (barn runoff basins) to collect, filter, and discharge barn stormwater runoff.

32. As stated in Daley’s application for permit coverage under the Individual NPDES Feedlot Permit, and confirmed in the MPCA’s review of the application and in the EAW, Daley will install perimeter drain tiles below the dual lined (concrete/HDPE and earthen) LMSA. Daley will install inspection ports on the perimeter tiles to allow for observation of the drains tiles to ensure these are functioning properly and to identify seepage from the LMSA if a leak were to occur.

33. The Individual NPDES Feedlot Permit; also requires Daley to develop updates to its MMP that meet the requirements of Minn. R. 7020.2225. The MMP describes how manure generated at the feedlot is land applied during the fall or spring in a way that maximizes the benefits to cropland, meets all rules and regulations, and protects surface water quality. Daley prepared and submitted a MMP with the Individual NPDES Feedlot Permit application. Once approved, the MMP becomes an integral and enforceable part of the Individual NPDES Feedlot Permit.

34. The Project will require approximately 4,083 acres of land for manure application. Daley has identified 4,179 acres of cropland available for manure application.

35. Daley will hire a CAWT to land apply manure generated by the Project to cropland owned by the manure recipients, as well as land owned by Daley. The CAWT must land apply manure using accepted industry methods to prevent manure spilling onto public roadways. If spillage occurs, the CAWT must remove and properly dispose of the manure in accordance with Minn. R. 7020.2010.

36. The Individual NPDES Feedlot Permit requires Daley, prior to or at the time of manure land application, to provide the manure recipient with the most current manure nutrient analysis. The manure recipient will follow the application of manure as applicable under Minn. R. 7020.2225 or local requirements, whichever is the more stringent. Daley will follow the same requirements for the manure that it applies to the land application sites that it controls.

37. Daley, the CAWT, and the person receiving transferred manure from Daley must keep records of manure land application. Minn. R. 7020.2225 and the Individual NPDES Feedlot Permit contain recordkeeping requirements.

38. Daley must keep records for the six most recent years. Transferred manure records need to include: the commercial applicator that is receiving and applying the manure, amount and nutrient
content of manure delivered, the name and address of the recipient of the manure, and the location and rate where the manure is applied. Retained manure records need to include: nutrient content of manure applied, rate of application, location of application, date of application, application method including timing of incorporation, expected plant-available amounts of nitrogen and phosphorus released from manure and commercial fertilizers, a description of changes to the MMP, and soil nutrient test results.

39. The CAWT must, no later than 60 days following land application, provide Daley with the amount and nutrient content of manure delivered, the name and address of the recipient of the manure, and the location and rate where the manure is applied.

40. The person receiving manure from Daley must complete and comply with Daley’s MMP, and keep records including: nutrient content of manure applied, rate of application, location of application, date of application, application method including timing of incorporation, expected plant-available amounts of nitrogen and phosphorus released from manure and commercial fertilizers, a description of changes to the MMP, and soil nutrient test results.

41. In order to avoid contaminating the groundwater at the manure application sites, the CAWT will apply manure at agronomic rates based on the type of crop grown, the soil type, and the soil chemistry to minimize the potential for nitrate leaching into the groundwater. Minn. R. ch. 7020.2225 governs the requirements for land application of manure, including setbacks to county and/or water supply wells, open well intakes, special protection areas, sinkholes, mines, quarries, and wells. Where a county also has setback requirements, Daley, the CAWT, and the recipients of transferred manure must follow the most restrictive of the state and county setback requirements.

42. Daley agrees to comply with special Individual NPDES Feedlot Permit conditions, beyond what is required in feedlot rule, to better mitigate nitrate loss from manure application. Daley will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the Minnesota Department of Agriculture (MDA) soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by thermometer at a depth of 6 inches.

2. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.

3. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by soil temperature taken by thermometer at a depth of 6 inches.

4. Planting/seeding a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.
5. Applying manure in the spring.

6. Split-applying nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoiding application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5, and 6.

43. The MPCA finds that the measures specified above will mitigate the potential for adverse impacts on groundwater quality related to manure incorporated at the manure application sites.

44. The land application of manure, if done improperly, can not only adversely impact groundwater, but can adversely impact surface water resources through manure-laden runoff or manure residue leaching into drain tile lines that outfall to surface waters. Therefore, the MMP requires the CAWT to observe MPCA and/or county setback requirements, as well as all other applicable federal and state rules, whichever are most restrictive, around drain tile intakes located within and adjacent to manure application areas, and near other surface water resources.

45. The MMP requires manure applications to follow all applicable required setbacks from sensitive features, such as karst features and waterways. The land application practices in the MMP, once approved by the MPCA, become enforceable provisions of the Individual NPDES Feedlot Permit.

46. According to University of Minnesota Agriculture Extension manure management information, manure contains several essential plant nutrients and contributes to increased crop yields when properly applied to soils. Manure provides valuable organic matter to soil that improves soil tilth, aids in the retention of water and nutrients, and promotes growth of beneficial microorganisms.

47. Minnesota’s “Final Animal Agriculture Generic Environmental Impact Statement” (2002) and the University of Minnesota Agriculture Extension Program state that manure not only supplies nutrients, but can also improve the biological and physical properties of soil, making it more productive and less erosive.

48. Manure, when properly used as part of a soil management program, improves soil quality, builds soil structure, and increases the level of soil organic matter. Commercial fertilizers cannot provide these same improvements to soil properties.

49. Landowners may alternate between commercial fertilizers and manure for differing reasons. However, Minnesota rule requires that landowners receiving manure on their fields only add commercial nitrogen fertilizer in quantities to meet the nitrogen needs of non-legume crops or nitrogen removal of legume crops they plan to grow.

50. Daley will hire a licensed CAWT to land apply the manure from the Project. The CAWT will land apply manure by direct injection. Daley’s MMP, once approved by the MPCA, will require Daley, the CAWT, and the recipients of transferred manure to incorporate manure via direct injection into the soil.

51. The MPCA finds that the quality of the stormwater runoff from land application areas for the manure will not significantly change if managed in accordance with the MMP required by the Individual NPDES Feedlot Permit.
52. The MPCA finds that the requirements of the Individual NPDES Feedlot Permit and the MMP minimize the potential for manure applied at manure application sites to enter surface waters.

53. The MPCA finds that the information presented in the EAW and other information in the environmental review record is adequate to assess potential impacts to water quality that are reasonably expected to occur from the Project.

54. The MPCA finds Daley has developed adequate measures in its MMP to prevent or mitigate potential water quality impacts.

55. The Individual NPDES Feedlot Permit includes conditions for the prevention of adverse effects on surface water and groundwater quality due to manure storage and application.

56. MPCA does not expect the project, if constructed as designed and operated in accordance with the Individual NPDES Feedlot Permit and MMP, will have significant adverse impacts on water quality. If violations of the Individual NPDES Feedlot Permit or the MMP were to occur, the MPCA has regulatory enforcement powers to correct the violations and address and mitigate any impacts to waters. Therefore, the MPCA finds any reasonably expected water quality impacts that may occur from the Project are reversible. The MPCA finds that information presented in the EAW and other information in the environmental review record are adequate to assess potential impacts to the quality of surface water and groundwater that are reasonably expected to occur from the Project.

57. The MPCA finds the Project, as proposed, does not have the potential for significant environmental effects based on the type, extent and reversibility of impacts related to surface water and groundwater quality, which are reasonably expected to occur.

Groundwater Appropriation

58. Daley currently has two water wells at its existing feedlot, which is also its proposed Project site (Unique Well IDs 00591916 and 00678949).

59. Daley has received a Minnesota Department of Natural Resources (DNR) Water Appropriation Permit for its two existing wells.

60. Daley’s two existing wells are registered with the Minnesota Department of Health (MDH).

61. Daley’s existing wells are used at its feedlot for drinking water for livestock and employees, as well as livestock cooling, facility cleaning, and sanitary use.

62. The Project would result in Daley constructing two additional water wells at its feedlot site, for a total of four wells. The two new wells would serve the same purpose as the existing two wells.

63. The Project would result in Daley increasing its water use at the Project site from 32 million gallons per year to 92 million gallons per year (i.e., an increase of approximately 60 million gallons per year). This would be a total consumption of 2.3 billion gallons of water over 25 years.

64. Daley will be required to obtain a modification to its current Water Appropriation Permit before they would be allowed to appropriate the additional water needed for the Project.

65. The DNR is the permitting authority for appropriating waters of the state in Minnesota. The DNR Water Appropriations Permit allows for a reasonable use of water if the use does not negatively impact surrounding wells or other water resources.
66. The purpose of the DNR Water Appropriation Permit is to ensure water resources are managed so that adequate supply is available for long-range seasonal requirements for domestic, agricultural, fish and wildlife, recreational, power, navigational, and water quality.

67. The DNR Water Appropriation Permit balances competing management objectives, including both the development and protection of water resources. Minn. Stat. § 103G.261 establishes domestic water use as the highest priority of the State's water when supplies are limited. If a well interference arises, the DNR has a standard procedure for investigating the matter. If the DNR finds a commercial operator is causing interference, the operator must correct it.

68. Unauthorized pumping or use of the well or other water resources is subject to enforcement under Minn. Stat. § 103. Upon completion of an investigation, a permit for water appropriation may be limited, amended, or denied in accordance with applicable laws and rules for the protection of the public interests and the sustainability of Minnesota's water resources.

69. Daley has not installed the new wells at the Project site at the time of this Order. Daley has coordinated with the DNR to obtain a Well Construction Preliminary Assessment for the proposed new wells. The Well Construction Preliminary Assessment provides the DNR's preliminary approval to construct the wells, and does not constitute an authorization to operate the wells or guarantee DNR appropriation permit approval.

70. Following the completion of environmental review, Daley may pursue the water appropriation permitting process with the DNR. The Well Construction Preliminary Assessment is information that Daley can use to decide whether to proceed in constructing a well, but does not act as a notification to the MDH, nor is it a DNR water use permit.

71. Daley intends to register the wells at the Project site with the MDH following well construction, and apply for a modification to the existing DNR Water Appropriation Permit, for the proposed wells at the Project site in order to use the new wells. The DNR reviews the permit applications upon approval of the Individual NPDES Feedlot Permit, which determines final animal numbers and, hence, water consumption.

72. Unauthorized pumping or use of wells without a DNR Water Appropriation Permit is subject to DNR enforcement under Minn. Stat. § 103. Upon completion of a permit review period, a Water Appropriation Permit may be limited, amended, or denied by the DNR in accordance with applicable laws and rules for the protection of the public interests and the sustainability of Minnesota's water resources.

73. If the DNR determines there may be the potential for impacts to resources such as trout waters, Wetland Conservation Act (WCA) wetlands, public watercourses, rare species, sites of outstanding biodiversity, wellhead protection areas, and/or wildlife management areas, the DNR has the authority to require additional testing and monitoring for those impacts.

74. Due to the DNR oversight and permitting of water appropriations, the MPCA does not expect significant adverse impacts to water appropriation. However, if the DNR determines there is well interference based on concerns or well interference claims, the DNR has regulatory enforcement authority to address it, including the authority to order the operator to fix the causes of the interference. Thus, the impacts to water appropriations would then be reversed. Therefore, the MPCA finds that any water appropriation impacts that may occur from the Project are reversible.
75. The MPCA finds that the Project, as proposed, does not have the potential for significant environmental effects based on the type, extent, and reversibility of impacts related to water appropriations that are reasonably expected to occur.

Air Quality

76. Daley conducted air dispersion modeling to estimate the atmospheric concentrations of hydrogen sulfide, ammonia, and the intensity of odorous gases at the Project property lines and nearest neighbors.

77. Daley’s air modeling used the American Meteorological Society Regulatory Model (AERMOD) developed by the American Meteorological Society and the U.S. Environmental Protection Agency. The model evaluated the air quality impacts of the Project. AERMOD is a widely accepted air dispersion model, which uses conservative assumptions to predict air quality.

Air Quality Related to Hydrogen Sulfide Emissions

Minnesota Ambient Air Quality Standards (MAAQS)

78. The air modeling predicts that the Project will comply with the 30 parts per billion (ppb) hydrogen sulfide MAAQS. Under the MAAQS, the third exceedance of the MAAQS within any 5-day period is a violation. The air modeling predicts compliance when the high third high hydrogen sulfide concentration for any 5-day period at each property-line receptor is less than 30 ppb.

79. The air modeling predicts that the emissions from the Project and existing nearby feedlots will result in a maximum property-line hydrogen sulfide concentration of 7.72 ppb. The estimated hydrogen sulfide background concentration in the Project area is 17 ppb. The total hydrogen sulfide concentration is predicted to be 24.72 ppb at the Project’s property lines.

Sub-Chronic Inhalation Health Risk Value (iHRV)

80. The air modeling predicts that the Project will not exceed the 10 micrograms per cubic meter (μg/m$^3$) subchronic (13-week) hydrogen sulfide iHRV at neighboring residences. Inhalation Health Risk Values are concentrations of chemicals emitted to air that are unlikely to pose a significant risk of harmful effects when humans are exposed to those concentrations over a specified period.

81. The air modeling predicts that the emissions from the Project and existing nearby feedlots will result in a maximum monthly hydrogen sulfide concentration of 0.42 μg/m$^3$ at the nearest residence. The estimated hydrogen sulfide background concentration in the Project area is 1.0 μg/m$^3$. The predicted total maximum monthly hydrogen sulfide concentration at the neighboring residences is 1.42 μg/m$^3$. Note that while the iHRV is for a 13-week period, AERMOD is not capable of averaging concentrations for that time-period, so a monthly averaging period was used instead. The monthly averaging period is acceptable because it produces a more conservative or protective prediction than the 13-week period.

82. Based on the air modeling results discussed above, the MPCA finds that hydrogen sulfide emissions expected from the Project do not present the potential for significant environmental effects.
Air Quality Related to Ammonia Emissions

**Acute iHRV**

83. The air modeling predicts that the Project will not exceed the 3,200 μg/m$^3$ (1-hour) acute ammonia iHRV at the Project’s property-line.

84. The air modeling predicts that the emissions from the Project and existing nearby feedlots will result in a maximum hourly property-line ammonia concentration of 814 μg/m$^3$. The estimated ammonia background concentration in the Project area is 148 μg/m$^3$. The maximum total property-line ammonia concentration is predicted to be 962 μg/m$^3$.

**Chronic iHRV**

85. The air modeling predicts that the Project will not exceed the 80 μg/m$^3$ (1-year) chronic ammonia iHRV at neighboring residences to the Project site.

86. The air modeling predicts that the emissions from the Project and existing nearby feedlots will result in a maximum 1-year time averaged ammonia concentration of 19.54 μg/m$^3$ at the neighboring residences. The estimated ammonia background concentration in the Project area is 5.7 μg/m$^3$. The maximum total (Project emissions plus existing background) ammonia concentration is predicted to be 25.3 μg/m$^3$ at the nearest residences.

87. Based on the air modeling results discussed above, the MPCA finds that ammonia emissions expected from the Project do not present the potential for significant environmental effects.

Air Quality Related to Odor Emissions

88. Although the state of Minnesota has not established ambient air quality standards to regulate odor, Daley completed air dispersion modeling for odor.

89. The modeled maximum hourly odor intensity, at the Project’s property lines is 238 odor units (OU) and occurs on the north boundary line. This predicted odor intensity is below the “moderate” odor threshold of 244 OU and above the “faint” odor threshold of 83 OU, as defined by the air modeling report used in the EAW for this Project (Attachment T of EAW).

90. The modeled maximum hourly odor intensity at the nearest residences is 126 OU. This predicted odor intensity is below the “moderate” odor threshold and above the “faint” odor threshold.

91. Daley has submitted an air emissions and odor management plan to the MPCA with its Individual NPDES Feedlot Permit application. The plan includes measures that Daley will take to minimize the generation of odors from its existing and proposed feedlots and from associated manure application activities. Daley will maintain an organic crust on the LMSAs and immediately inject liquid manure into the soil as its manure application method to minimize odors. Daley has also taken other measures as listed in item 6.B. of the EAW to further reduce odors.

92. Based on the modeling results discussed above, the MPCA finds that odor at the Daley’s property lines and nearby residences does not present the potential for significant environmental effects.
Summary of Air Quality Impacts

93. The MPCA expects the Project to meet applicable Minnesota ambient air quality standards and health risk value guidance.

94. With respect to the reversibility of air quality impacts expected to occur from the Project, air emissions from the Project will continue while it remains in operation and would cease only if the Project were temporarily or permanently closed.

95. If excessive air emissions or violations of the ambient hydrogen sulfide air standards were to occur, or if Daley exceeded iHRVs for ammonia, air quality impacts are likely correctable. The MPCA could initiate an investigation and require Daley to make operation and maintenance changes. Therefore, the MPCA finds that any impacts on air quality that may occur from the Project are reversible.

96. The MPCA finds that information presented in the EAW and other information in the environmental review record are adequate to assess the impacts on air quality that are reasonably expected to occur because of the Project.

97. The MPCA finds the Project, as proposed, does not have the potential for significant environmental effects based on the type, extent, and reversibility of impacts on air quality reasonably expected to occur from the Project.

Non-compliance at existing Daley operations

98. The existing LLP site does not comply with the surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412 and is currently operating under an Individual NPDES permit for addressing the portion of the feedlot (small part of feed pad runoff collection) that is not meeting the requirements. In addition to expansion at the site, Daley will construct/install runoff control measures for the portion of the existing feedlot that is currently not meeting effluent limitation requirements. Upon completion of the project, existing and proposed feedlot components will meet effluent limitation requirements.

99. The existing feedlot at the LLP1 site does not meet surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412. If Daley receives all permits and approvals for the proposed Project, Daley will close the LLP1 site. If Daley is unable to receive all needed permits and approvals, Daley will keep operating the LLP1 site. And, in accordance to the Individual NPDES Feedlot Permit Schedule of Compliance, Daley will construct open-lot runoff controls to create a compliant feedlot, meeting surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412.

100. The existing feedlot at the LLP7 site does not meet surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412. However, in accordance to Individual NPDES Feedlot Permit Schedule of Compliance, Daley will construct open-lot runoff controls at the LLP7 site to create a feedlot meeting surface water effluent limitation requirements of Code of Federal Regulations, Title 40, section 412.

101. The MPCA finds that the impacts that are reasonably expected to occur from the existing noncompliant activities at the feedlot will be adequately addressed through the information presented in the EAW and the environmental review record for the Project.
102. The MPCA finds that because the existing non-compliant issues will be addressed by permit requirements in the Individual NPDES Feedlot Permit, the Project does not have the potential for significant environmental effects based on the type, extent, and reversibility of impacts from the Project.

Karst geology concerns

103. The southeastern part of Minnesota has karst geology and therefore contain sinkholes, caves, springs and other karst features that allow pollutants to enter groundwater quickly.

104. Daley conducted several geotechnical evaluations, including soil borings, on the Project property. No karst features were identified at the existing or proposed feedlot or LMSA sites.

105. Manure land application site 5, to the northeast of the proposed LMSA, contains a mapped sinkhole. Minn. R. 7020.2005, subp. 1, prohibits construction of a new animal feedlot or a manure storage area within 300 feet of a sinkhole. MPCA technical staff verified that the proposed feedlot and LMSA are more than 300 feet from the mapped sinkhole. Therefore, the Project design complies with this setback requirement.

106. Manure land application sites 1, 2, 5, 9N, 10, 11, 12, 23, 24, 27, 29N, 32, 33, 34, 45, 36, 39, 40, Lappier’s, and Matt’s contain or are near mapped sinkholes. Open sinkholes may provide direct access of surface pollutants, such as nitrate dissolved in water, to groundwater through fractured bedrock. At these sites, Daley will follow manure application practices and setbacks required in the Individual NPDES Feedlot Permit or Minn. R. 7020.2225, subp. 8, as applicable.

107. Manure land application sites 3, 4, 5, 6, 8, 9N, 9S, 11, 12, 13, 19, 20, 21, 22, 24, 25, 26, 27, 28, 32, 34, 36, 39, 41, Lappier’s, Matt’s, and Orlies contain soils developed in bedrock, described as shallow bedrock in soils. Shallow bedrock provides greater risk of pollution leaching to groundwater since there is less soil to absorb and treat pollutants before reaching bedrock.

108. Daley agrees to comply with special Individual NPDES Feedlot Permit conditions, beyond what is required in feedlot rule, to better mitigate nitrate loss from manure application. Daley will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by thermometer at a depth of 6 inches.

2. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.

3. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by soil temperature taken by thermometer at a depth of 6 inches.

4. Planting/seeding a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end
of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Applying manure in the spring.

6. Split-applying nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoiding application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

109. The MPCA finds that information presented in the EAW and other information in the environmental review record are adequate to assess the impacts from karst geology that are reasonably expected to occur because of the Project.

110. The MPCA finds the Project, as proposed, does not have the potential for significant environmental effects based on the type, extent, and reversibility of impacts from karst geology reasonably expected to occur from the Project.

Winona County Animal Unit Limit

111. A Winona County ordinance prohibits new feedlots or expansions of feedlots in excess of 1,500 AU. Daley’s existing operations exceed this cap because Daley’s operations were grandfathered in at the time of the ordinance.

112. According to the grandfathering allowance, Daley may not exceed the AU at its feedlot at the time of the ordinance passage, which is 2,275.2 AU. Therefore, for Daley to increase the feedlot to the proposed 5,967.7 AU, Daley must apply for a variance or exemption from the Winona County ordinance to construct the Project.

113. If the Winona County variance or exemption is not approved, the expansion at the LLP site may not be constructed. Additionally, Daley will not close the LLP1 site, and instead will add open-lot runoff controls, in accordance with the Individual NPDES Feedlot Permit Schedule of Compliance.

114. Winona County’s decision on granting a variance or exemption is independent of the MPCA’s environmental review process.

Cumulative Potential Effects

115. The second criterion that the MPCA must consider when determining if a project has the potential for significant environmental effects is the “cumulative potential effects.” In making this determination, the MPCA must consider “whether the cumulative potential effect is significant; whether the contribution from the project is significant when viewed in connection with other contributions to the cumulative potential effect; the degree to which the project complies with approved mitigation measures specifically designed to address the cumulative potential effects; and the efforts of project proposer to minimize the contributions from the project.” Minn. R. 4410.1700 subp. 7(B). The MPCA findings with respect to this criterion are set forth below.
116. The EAW, public comments, and MPCA follow-up evaluation did not disclose any related or anticipated future projects that may interact with this Project in such a way as to result in significant cumulative potential environmental effects.

117. The EAW addressed the following cumulative potential effects of the proposed Project:
   - Surface water and groundwater quality
   - Groundwater appropriation
   - Air quality

**Surface Water and Groundwater Quality**

118. The Project and its associated manure application sites are within either the Mississippi River – Winona Watershed or the Root River Watershed in Winona County.

119. The Project and its manure application sites are in areas where the land use is predominantly agricultural. Feedlots in these areas have the potential to contribute to water pollution.

120. Whitewater River South Fork, Peterson Creek, and Rush Creek are the closest listed impaired water bodies to the Project and its manure application sites.

121. Whitewater River South Fork and Peterson Creek are both located within the Mississippi River – Winona Watershed. Whitewater River South Fork is approximately 2 miles northwest of the Project site and Peterson Creek is located approximately 2.5 miles east of the Project site.

122. The MPCA’s 2018 impaired waters list identifies Whitewater River South Fork (AUID 07040003-512) as impaired for: Aquatic macroinvertebrates bioassessments, turbidity, fecal coliform, and nitrates. This reach of the river is included in the January 2016 Mississippi River – Winona Watershed Pollutant Reduction Project Total Maximum Daily Load (TMDL) for Nutrients, Sediments and Bacteria. The TMDL identifies feedlots and associated land application of manure as a potential contributor to these impairments.

123. The MPCA’s 2018 impaired waters list identifies Peterson Creek (AUID 07040003-529) as impaired for fecal coliform. This reach of the river is included in the January 2016 Mississippi River – Winona Watershed Pollutant Reduction Project TMDL for Nutrients, Sediments and Bacteria. The TMDL identifies feedlots and associated land application of manure as a potential contributor to this impairment.

124. Rush Creek is located within the Root River Watershed and is approximately 2 miles southeast of the Project site.

125. The MPCA’s 2018 impaired waters list identifies Rush Creek (AUID 07040008-524) as impaired for aquatic macroinvertebrate bioassessments. This reach of the river is included in the November 2016 Root River Watershed TMDL Report for Bacteria, Nitrate and Suspended Solids, which provides nitrate as one of the stressors of the biota in this reach.

126. The Individual NPDES Feedlot Permit is consistent with the Mississippi River – Winona Watershed nitrate reduction strategies for nutrient management and soil health.

127. The MDA determines current nitrate-nitrogen concentrations in private wells, on a township scale, through the Township Testing Program. The MDA has conducted nitrate-nitrogen testing on private wells in townships throughout the state that are vulnerable to groundwater contamination and have significant row crop production. The testing results for Utica, Fremont and St. Charles townships,
where the Project and manure application sites are located, identified nitrate-nitrogen concentrations above the Health Risk Limit (HRL) of 10 milligrams/liter in 19.6%, 42.9% and 14.5%, respectively, of the wells tested. Daley agrees to comply with special Individual NPDES Feedlot Permit conditions, beyond what is required in feedlot rule, to better mitigate nitrate loss from manure application. Daley will employ two or more of the practices listed in Findings of Fact 42 and 108 on field areas where liquid manure is applied.

128. The MPCA does not expect Project-generated manure-contaminated runoff from the Project site because it is a total confinement facility. In addition, the Project will operate under the NPDES feedlot permitting system, which has more stringent MMP requirements than smaller feedlots in the region. Finally, the manure from the Project is liquid and will be incorporated into the soil by direct injection, which reduces the likelihood that manure will run off the fields.

129. The Individual NPDES Feedlot Permit requires that the Project meet zero discharge standards (except in extreme weather events such as a 25-year, 24-hour rain event). As a result, the MPCA does not expect any discharge of manure or manure-contaminated runoff to any waters of the state.

130. All manure application sites must also comply with MPCA and county setback requirements, as well as all other applicable federal and state rules, whatever are the most restrictive.

131. The MMP, in order to prevent impacts to any waters of the state, is designed specifically for the manure that Daley expects to generate at the Project and send to the manure application sites.

132. Proper operation and management of the Project and adherence to appropriate manure land application practices in the MPCA-approved MMPs will prevent runoff of manure and/or manure-contaminated stormwater runoff from impacting waters of the state.

133. Since the Individual NPDES Feedlot Permit and MMPs require preventative measures to protect surface water and groundwater quality, the MPCA does not anticipate the Project will contribute to any potentially significant adverse effects on water quality. Therefore, the MPCA finds that the Project is not expected to contribute significantly to adverse cumulative potential effects on water quality.

Groundwater Appropriation

134. Daley currently has two existing wells at the Project site. The Project plans to add two more wells at the site. The Project would result in Daley increasing its water use from 32 million gallons per year to 92 million gallons per year (i.e., an increase of approximately 60 million gallons per year). This would be a total consumption of 2.3 billion gallons of water over 25 years.

135. Daley holds a DNR Water Appropriation Permit for its existing two wells. Daley will be required to obtain a modification to its current Water Appropriation Permit before it would be allowed to appropriate the additional water requested for its two new wells.

136. The purpose of the DNR permit program is to ensure management of water resources so that adequate supply is provided to long-range seasonal requirements for domestic, agricultural, fish and wildlife, recreational, power, navigational, and quality control. The permit program balances competing management objectives, including both the development and protection of water resources. Minn. Stat. § 103G.261 establishes domestic water use as the highest priority of the state’s water when supplies are limited. If a well interference arises, the DNR has a standard
procedure for investigating the matter. If the DNR determines that a commercial operator is causing the problem, the operator must correct it.

137. The MPCA finds that the Project is not expected to contribute significantly to adverse cumulative potential effects on water appropriation.

Air Quality

138. The MPCA evaluated cumulative potential effects on air quality by comparing the MAAPQS for hydrogen sulfide, iHRVs for hydrogen sulfide and ammonia, and odor intensity thresholds with concentrations in the air predicted by air modeling.

139. The modeling analysis included the estimated emissions from the Project, nearby feedlots, and incorporated conservative background concentrations to account for the potential impacts of air emissions from other air emissions sources in the area of the Project. The modeling analysis estimated air concentrations for these pollutants at the residences closest to the Project.

140. All modeled air pollutant concentrations for the Project were below the health-based criteria used in the analyses. Therefore, the MPCA finds that cumulative potential effects on air quality will not be significant in the Project area, and the Project will not contribute significantly to adverse cumulative potential effects on air quality.

Cumulative Effects – Summary

141. Based on information on the Project obtained from air modeling reports and Individual NPDES Feedlot Permit application processes, information on water quality and groundwater appropriation presented in the EAW, and consideration of potential effects due to related or anticipated future projects, the MPCA does not expect significant cumulative effects from this Project.

142. The MPCA finds the Project, as proposed, does not have the potential for significant environmental effects related to cumulative potential effects that are reasonably expected to occur.

The Extent to Which the Environmental Effects Are Subject to Mitigation by Ongoing Public Regulatory Authority

143. The third criterion that the MPCA must consider when determining if a project has the potential for significant environmental effects is “the extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority. The RGU may rely only on mitigation measures that are specific and that can be reasonably expected to effectively mitigate the identified environmental impacts of the project.” Minn. R. 4410.1700, subp. 7.C. The MPCA Findings with respect to this criterion are set forth below.

144. The following permits or approvals will be required for the Project.

<table>
<thead>
<tr>
<th>Unit of Government</th>
<th>Permit or Approval Required</th>
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<tbody>
<tr>
<td>MPCA</td>
<td>State of Minnesota Individual Animal Feedlot National Pollution Discharge Elimination System (NPDES) Permit (Individual NPDES Feedlot Permit) MN0067652 – including NPDES/State Disposal System General Construction Stormwater Permit requirements</td>
</tr>
<tr>
<td>Winona County</td>
<td>Animal Unit Cap Variance or Exemption</td>
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<tr>
<td>Winona County</td>
<td>Conditional Use Permit</td>
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<tr>
<td>Utica Township</td>
<td>Building Permit</td>
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<tr>
<td>DNR</td>
<td>Water Appropriation Permit</td>
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145. MPCA Individual NPDES Feedlot Permit. The MPCA requires Daley to obtain an Individual NPDES Feedlot Permit for the Project. The Individual NPDES Feedlot Permit incorporates construction and operation requirements, and includes operating plans that address manure management, emergency response protocols, stormwater, and odor/air quality management. The attachments are an enforceable condition of the Individual NPDES Feedlot Permit.

146. Winona County Animal Unit Cap Variance or Exemption. Winona County has a 1,500 AU cap ordinance. Daley's existing operations exceed this cap because Daley's operations were grandfathered in at the time of the passage of the ordinance. However, for Daley to exceed its existing AU count through the proposed Project, it must receive a variance or exemption from Winona County.

147. Winona County Conditional Use Permit. Daley is required to obtain all required building and conditional use permits required by local units of government to ensure compliance with local ordinances. The Conditional Use Permit will address local zoning, environmental, regulatory, and other requirements needed to avoid adverse effects on adjacent land.

148. Utica Township Building Permit. Daley is required to obtain all required building and conditional use permits required by local units of government to ensure compliance with local ordinances.

149. DNR Water Appropriation Permit. Daley must obtain a DNR Water Appropriation Permit modification for the Project, as the Project will be withdrawing more than 10,000 gallons per year. Daley will hire a licensed well driller to install the two new production wells.

150. The above-listed permits include general and specific requirements for mitigation of environmental effects of the Project. The MPCA finds that the environmental effects of the Project are subject to mitigation by ongoing public regulatory authority.

The Extent to Which Environmental Effects can be Anticipated and Controlled as a Result of Other Available Environmental Studies Undertaken by Public Agencies or the Project, Including Other EISs

151. The fourth criterion that the MPCA must consider is "the extent to which environmental effects can be anticipated and controlled as a result of other available environmental studies undertaken by public agencies or the project proposer, including other EISs," Minn. R. 4410.1700, subp. 7.D. The MPCA Findings with respect to this criterion are set forth below.

152. Although not exhaustive, the MPCA reviewed the following documents as part of the environmental impact analysis for the Proposed Project: data presented in the EAW, Individual NPDES Feedlot Permit application, with MMPs and attachments, Air Dispersion Modeling Report, Minnesota's "Final Animal Agriculture Generic Environmental Impact Statement" (2002), MDA Township Testing Program results, MPCA's report Nitrogen in Minnesota Surface Waters (June 2013), The Minnesota Nutrient Reduction Strategy (September 2014), and permits and environmental review of similar projects.

153. The MPCA also relies on information provided by Daley, persons commenting on the EAW, staff experience, and other available information obtained by staff.

154. The environmental effects of the Project have been addressed by the design and permit development processes, and state and local permit and plan requirements and approvals by ensuring conformance with regional and local plans. No elements of the Project pose the potential for significant environmental effects.
On the Need for an Environmental Impact Statement
Daley Farms of Lewiston, LLP – 2018 Dairy Expansion
Utica Township, Winona County, Minnesota

Findings of Fact
Conclusions of Law
And Order

155. Based on the environmental review, previous environmental studies by public agencies or Daley, and staff expertise and experience on similar projects, the MPCA finds that the environmental effects of the Project that are reasonably expected to occur can be anticipated and controlled.

156. The MPCA adopts the rationale stated in the attached Responses to Comments (Appendix B) as the basis for response to any issues not specifically addressed in these Findings.

CONCLUSIONS OF LAW

157. The MPCA has jurisdiction in determining the need for an EIS for this Project. The EAW, the permit development process, and the evidence in the record are adequate to support a reasoned decision regarding the potential for significant environmental effects that are reasonably expected to occur from this Project.

158. The MPCA identified areas for potentially significant environmental effects. The Project design and permits ensure that Daley will take appropriate mitigation measures to address significant effects. The MPCA expects the Project to comply with all environmental rules, regulations, and standards.

159. Based on a comparison of the impacts that are reasonably expected to occur from the Project with the criteria established in Minn. R. 4410.1700 subp. 7, the Project does not have the potential for significant environmental effects.

160. An EIS is not required for the proposed Daley Farms of Lewiston, LLP – 2018 Dairy Expansion.

161. Any Findings that might properly be termed conclusions and any conclusions that might properly be termed Findings are hereby adopted as such.

ORDER

162. The Minnesota Pollution Control Agency determines that there are no potentially significant environmental effects reasonably expected to occur from the Daley Farms of Lewiston, LLP – 2018 Dairy Expansion and that there is no need for an Environmental Impact Statement.

IT IS SO ORDERED

[Signature]
John Linc Stine, Commissioner
Minnesota Pollution Control Agency

1/4/19
Date
STATE OF MINNESOTA
MINNESOTA POLLUTION CONTROL AGENCY

IN THE MATTER OF THE DENIAL OF A CONTESTED CASE
HEARING REQUEST AND MODIFICATION OF A NOTICE OF COVERAGE UNDER INDIVIDUAL NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM FEEDLOT PERMIT NO. MN0067652, FOR THE PROPOSED EXPANSION OF DALEY FARMS OF LEWISTON LLP, DALEY FARMS OF LEWISTON LLP 1, AND DALEY FARMS OF LEWISTON LLP 7 SECTION 16, UTICA TOWNSHIP

Based on Minnesota Pollution Control Agency (MPCA) staff review, comments and information received during the comment period, and other information in the record of the MPCA, the MPCA hereby makes the following Findings of Fact, Conclusions of Law, and Order:

FINDINGS OF FACT

Project Description

1. Daley Farms of Lewiston, LLP (Daley) proposes to expand its existing dairy feedlot in Section 16 of Utica Township, Winona County (Project). The existing feedlot consists of three sites, regulated under the State of Minnesota Individual Animal Feedlot National Pollution Discharge Elimination System (NPDES) Permit MN0067652 (Feedlot Permit).
   • LLP site, a 1,996.4 animal unit (AU) total confinement barns
   • LLP1 site, a 140 AU partial confinement barn and concrete lot without runoff control
   • LLP7 site, a 138.8 AU partial confinement barn and concrete lot without runoff control

2. The Project consists of the following items at the LLP site.
   • Adding a cross-vented, total confinement freestall barn with 3,000 dairy cows
   • Eliminating 525 dairy cows and adding 525 heifers to the existing barns
   • Adding a liquid manure storage area (LMSA)
   • Adding stormwater basins to collect the new barn stormwater runoff
   • Adding a rotary milking parlor with a holding area
   • Adding a sand processing and storage building
   • Adding an animal mortality building
   • Adding a feed storage pad
   • Adding a basin to collect feed storage pad stormwater runoff
   • Installing two livestock wells

3. The Project also consists of eliminating the LLP1 site, and adding open-lot runoff controls at the LLP7 site. Daley will add open-lot runoff controls, required to eliminate runoff from animal lots in order to create zero discharge from LLP7 site, in accordance with the Feedlot Permit Schedule of Compliance.

4. The Project would result in the feedlot increasing from 2,275.2 AU to 5,967.7 AU.
5. The Project would generate approximately 46.2 million gallons of manure annually, and 1.7 million gallons of runoff from the feed storage pad.

6. Daley will utilize the manure on its own fields, and fields owned by third parties who have entered into agreements with Daley.

7. Daley will land apply or hire a commercial animal waste technician (CAWT) to land apply manure to cropland according to the MPCA approved manure management plan (MMP).


9. Daley plans to construct the Project once environmental review is complete, and all necessary permits and approvals are granted.

PROCEDURAL HISTORY

Public Notices and Comment Periods for Feedlot Permit for Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7

10. On October 1, 2018, pursuant to Minn. R. 7001.0100, the MPCA issued a public notice of intent to modify coverage under the NPDES Individual Feedlot Permit for the construction of an expansion and operation at the Proposer’s Daley Farms of Lewiston LLP feedlot site. The public comment period was open for comment from October 1, 2018, through November 15, 2018.

11. The Public notice documents were available for review throughout the public comment period on the MPCA website at http://www.pca.state.mn.us/index.php/public-notices/list.html.

12. The MPCA met all applicable public notice requirements for the issuance of an NPDES Permit. Public Notice and Comment Period for the Environmental Assessment Worksheets for Feedlot Permit for Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7

13. Pursuant to Minn. R. ch. 4410, the MPCA prepared an Environmental Assessment Worksheet (EAW) assessing impacts for Feedlot Permit for Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7.

14. Meeting the requirements of Minn. R. 4410.1500, the MPCA provided notice of the EAW in the October 1, 2018, Environmental Quality Board (EQB) Monitor; made the EAW available for review on the MPCA website at http://pca.state.mn.us/news/eaw/index1trn; and provided a news release on the EAW to media in Minnesota and other interested parties, on October 1, 2018. At the time of submission of the EAW to EQB, the MPCA also submitted copies of the EAW to all entities listed in Minn. R. 4410.1500, subp. A.

15. The MPCA provided public notice of the Project as follows:

   a. The EQB published the notice of availability of the EAW for public comment in the EQB Monitor on October 1, 2018, as required by Minn. R. 4410.1500.
b. The EAW was available for review on the MPCA website at: http://www.pca.state.mn.us/news/eaw/index.html.

c. The MPCA provided a news release to media in Minnesota and other interested parties on October 1, 2018.

d. Daley’s draft Feedlot Permit was open for public comment on October 1, 2018.

e. On October 11, 2018, the MPCA extended both the EAW and Feedlot Permit comment period until November 15, 2018.

f. The MPCA provided a news release to the media in Minnesota and other interested parties on October 12, 2018, announcing the extension of the public comment periods.

g. The EBQ announced the extension of the public comment period in the EQB Monitor on October 22, 2108.

16. The MPCA met all applicable public notice requirements for the EAW.

17. The MPCA has prepared separate Findings of Fact, Conclusions of Law, and Order for the EAW.

18. During the 45-day comment period ending on November 15, 2018, the MPCA received 615 comment letters and six late comment letters received after November 15, 2018, on the EAW and the Feedlot Permit. The late comment letters, which are not included in the record, did not include any new information.

   Five commenters requested contested case hearings. Four of the requests did not meet criteria to be a valid request. One request was determined to be a valid request, indicating the concern that the draft permit for the Project and the Proposer’s MMP do not meet requirements of the Clean Water Act and State Law.

19. The list of the comments received during the 45-day public comment period are included as Appendix A to these Findings.

20. The MPCA prepared written responses to the comments received during the 45-day public comment period. These responses are included as Appendix B to these Findings.

21. In response to comments received while on public notice, on December 23, 2018, the Project Proposer submitted an addendum to its MMP. The addendum included additional manure application management practices that will be implemented and additional notifications that will be made during LMSA construction.

22. In response to comments received while on public notice, and the MMP addendum submitted by the Project Proposer on December 23, 2018, the Final Permit for the Project included additional requirements that were not part of the Draft Permit. The additional requirements were relating to manure management and notifications for LMSA construction.

23. The additional requirements added to the Proposer’s MMP and the Final Permit are not substantial requiring re-pubic notice of the permit.

24. The Proposer’s addendum to the MMP are in Appendix C of these findings.
EVALUATION OF THE REQUEST FOR A CONTESTED CASE HEARING

25. During the October 1, 2018, through November 15, 2018, public notice period for the MPCA's intent to issue coverage under the Individual NPDES Feedlot Permit, the MPCA received one request for a contested case hearing from the Minnesota Center for Environmental Advocacy (MCEA).

26. Minn. R. 7000.1800, subp. 2(A) sets out the requirements of a petition for a contested case hearing. A petition must include:
   
   a. A statement of reasons or proposed findings supporting a Board or Commissioner decision to hold a contested case hearing pursuant to the criteria in part 7000.1900, subpart 1.
   
   b. A statement of the issues proposed to be addressed by a contested case hearing and the specific relief requested or resolution of the matter.

27. Minn. R. 7000.1800, subp. 2(8) states:

   To the extent known by the petitioner, a petition for a contested case hearing may also include the following information
   
   (1) A proposed list of prospective witnesses to be called at the hearing, including experts, with a brief description of the testimony they will provide.
   
   (2) A proposed list of publications, references, or studies that the petitioner would introduce at the hearing.
   
   (3) An estimate of the time required for the petitioner to present the case at a hearing.

28. The MPCA notes that while the information specified in Minn. R. 7000.1800, subp. 2(8) is not required in a contested case hearing petition; it is information that is helpful to the MPCA as it considers whether a hearing will aid the Board or Commissioner in making a final decision.

29. The MPCA decision on whether to grant the petition is governed by Minn. R. 7000.1900, subp. 1, which states:

   The Board or Commissioner must grant the petition to hold a contested case hearing or order upon its own motion that a contested case hearing be held if it finds that:

   A. There is a material issue of fact in dispute concerning the matter pending before the Board or Commissioner.
   
   B. The Board or Commissioner has the jurisdiction to make a determination on the disputed material issue of fact.
   
   C. There is a reasonable basis underlying the disputed material issue of fact or facts such that the holding of a contested case hearing would allow the introduction of information that would aid the Board or Commissioner in resolving the disputed facts in making a final decision on the matter.

30. In order to satisfy the first criterion, Minn. R. 7000.1900, subp. 1(A), the hearing requester must show there is a material issue of fact in dispute as opposed to a disputed issue of law or policy.
fact is material if its resolution will affect the outcome of the case (O’Malley v. Ulland Brothers, 540 N.W.2d 889,892 (Minn. 1996)).

31. In order to satisfy the second criterion, Minn. R. 7000.1900, subp. I(B), the requester must show that the MPCA has jurisdiction or authority to make a determination on the disputed issues of material fact. "Agencies are not permitted to act outside the jurisdictional boundaries of their enabling act" (Cable Communications Board v. Nor-West Cable, 356 N.W.2d 658, 668 (Minn. 1984)). Therefore, each issue in the contested case request has to be such that it is within the MPCA’s authority to resolve.

32. Finally, under Minn. R. 7000.1900, subp. I(C), “[t]he petitioners for a contested case hearing have the burden of demonstrating the existence of material facts that would aid the [Agency] in making a decision before they are entitled to a contested case hearing” (Matter of Solid Waste Permit for the NSP Red Wing Ash Disposal Facility, 421 N.W.2d 398,404 (Minn. Ct. App. 1988)). The Minnesota Supreme Court has recognized that to meet this standard, “[i]t is simply not enough to raise questions or pose alternatives without some showing that evidence can be produced which is contrary to the action proposed by the (Agency)” (In the Matter of Amendment No. 4 to Air Emission Facility Permit, 454 N.W.2d 427,430 (Minn. 1990)).

33. The MPCA evaluated the outstanding request for a contested case hearing by examining each of the issues raised in the petition received, to determine if the petition met each of the three required criteria in Minn. R. 7000.1900, subp. 1.

THE MPCA FINDINGS WITH RESPECT TO EACH OF THESE CRITERIA

34. The MPCA finds that the contested case hearing petition (hereinafter "CCHR") submitted by MCEA was timely submitted prior to the close of the public comment period.

35. The MCEA CCHR petition requests that the MPCA deny the NPDES Permit for the Daley expansion. The petition also requests that the MPCA refer the disputed issues of material fact to the Office of Administrative Hearings for resolution in a contested case hearing if the MPCA does not deny the application.

36. The MCEA CCHR petition identifies six reasons for a contested case hearing. The MPCA’s findings regarding each of these reasons are as follows.

Reason #1: The Project’s MMP will allow application of manure at rates that exceed agricultural utilization of the nutrients, in violation of 40 C.F.R. § 412.4(c), 40 C.F.R. § 122.42(e), and Minn. R. 7020.2225, subp. 3.

The applicability of 40 C.F.R. § 412.4(c), 40 C.F.R. § 122.42(e), and Minn. R. 7020.2225, subp. 3, are a question of law and not a disputed material fact.

Furthermore, the requestor has not raised a material issue of fact that the project will result in application of manure at rates that exceed agricultural utilization of the nutrients but instead questions the rate limits within Minn. Rule 7020. This is a question of law not a disputed fact. Nonetheless, the MPCA offers the following in response.
The requestor states that the proposal utilizes an erroneous University of Minnesota recommendation for nitrogen application to the corn crop. This assertion is based on commentary provided by Dr. Gyles Randall, emeritus professor University of Minnesota, which states the "Corn N Rate Calculator" should be used and results in a recommendation of a 159 pounds (lbs) of nitrogen for corn following corn or 123 lbs of nitrogen for corn following soybeans. The Corn N Rate Calculator is a seven state regional tool developed primarily for use with commercial fertilizers, nonetheless; the University of Minnesota publication is consistent with the Corn N Rate Calculator.

The techniques used to arrive at nutrient recommendations for the Corn N Rate Calculator and most recent University of Minnesota publication methodology were developed for commercial fertilizers, meaning that it is not directly amenable to use when manure is the nutrient source. The MPCA has developed and published its interpretation of the recommendations when manure is the nutrient source. It can be found at: https://www.pca.state.mn.us/sites/default/files/wq-f8-18.pdf.

The recommendations cited by Dr. Randall are accurate should the N price/Crop value ratio within the Corn N Rate Calculator be considered to be 0.10; however, in accordance with the MPCA interpretation, the N price/Crop value ratio most applicable to use with manure nutrients is 0.05. Using this ratio the recommendation is 180 lbs N/acre for corn following corn and 140 lbs N/acre for corn following soybeans, which is consistent with the MMP for the project.

Dr. Randall also gave his opinion of some of the specifics of the MMP, namely field characteristics that give some fields a higher pollution potential than other fields. The MPCA agrees with that assertion but the application to those fields does meet the requirements of Minn. R. ch. 7020 and they are therefore eligible for manure application even if it is not from the proposed project. In other words, simply removing them from the MMP for this facility does not make them ineligible for manure application from other manure or nutrient sources. The fact that these fields are covered by an MMP incorporated into the NPDES Permit for the site means that they will receive more regulation and restrictions than if they were not a part of the MMP.

Finally, Dr. Randall questions the nutrient content of the manure, specifically how it can vary so much from the "book value." The values used in the MMP are the results of actual test from the existing facility which will be far more representative of actual conditions than a “book value” meant to generally apply to a similar operation. Further, the proposer intentionally utilized a book value for the manure generated from the proposed expansion instead of the lower actual test values from the current operation so that the total amount of nitrogen identified in the MMP is higher than what will likely actually be generated at the facility. In all likelihood, the nutrient content of the manure will be similar to the existing operation historical test values but the use of the higher book value will ensure that the MMP identified sufficient land available to apply the manure at agronomic rates.

Additionally, the feedlot rules and Feedlot Permit require manure and process wastewater application rates must be limited so that the estimated plant available nitrogen from all nitrogen sources does not exceed expected crop nitrogen needs for non-legume crops and expected nitrogen removal for legumes. Expected crop nitrogen needs, crop nitrogen removal rates, and estimated plant available nitrogen from manure and legumes must be based on the most recent published
recommendations of the University of Minnesota Extension Service or of another land grant college in a contiguous state.

The MPCA reviewed the submitted MMP, including planned nitrogen application rates used in the plan, and found it meets feedlot rule and permit requirements. The project proposers have chosen to implement the following BMP’s to further mitigate impacts from nitrate loss to ground and surface water:

Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the Minnesota Department of Agriculture (MDA) soil temperature network website: [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/), or documented by thermometer at a depth of six inches.
2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees, as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/), or documented by soil temperature taken by thermometer at a depth of six inches.
4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so as to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.
5. Apply manure in the spring.
6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.
7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

Reason #2: The Project’s land application practices will apply manure in a manner that will result in subsurface discharges of manure to groundwater, rendering the project ineligible for permit coverage and violating Minn. R. 7020.2003, subp. 1 and 7020.2225.

The applicability of Minn. R. 7020.2003, subp. 1 and 7020.2225 are a question of law and not a disputed material fact.

The commenter asserts the Project does not comply with the Feedlot Permit section 13.4 (no discharge to groundwater) requirements because of the karst topography and information provided in Dr. Randall's report (Exhibit 1 of the petition), and therefore the project is ineligible for coverage
under the Feedlot Permit. The eligibility of the project for permit coverage is a question of law and is not a disputed fact. Nonetheless, the MPCA offers the following response.

Section 13.4 of the proposed permit is only applicable to the facility, not the land application sites. The definition of facility is included within the draft permit and reads as such: "Facility means an animal feedlot, a manure storage area, or an animal feedlot with a manure storage area that is subject to the Permit."

Likewise, 7020.2003 subp1. is only applicable to an animal feedlot or manure storage area, not land application sites. The definition of animal feedlot in Minn. R. 7020 reads as such: "Animal feedlot means a lot or building or combination of lots and buildings intended for the confined feeding, breeding, raising, or holding of animals and specifically designed as a confinement area in which manure may accumulate, or where the concentration of animals is such that a vegetative cover cannot be maintained within the enclosure. For purposes of these parts, open lots used for the feeding and rearing of poultry (poultry ranges) shall be considered to be animal feedlots. Pastures shall not be considered animal feedlots under these parts." The definition of manure storage area in Minn. R. 7020 reads as such: "Manure storage area means an area where animal manure or process wastewaters are stored or processed. Short-term and permanent stockpile sites and composting sites are manure storage areas. Animal manure packs or mounding within the animal holding area of an animal feedlot that are managed according to part 7020.2000, subpart 3, are not manure storage areas." Neither of these definitions include land application areas.

The arguments presented are all related to land application of manure and therefore would not be subject to either permit or rule parts cited, rendering them moot.

Even though the land application sites are not subject to the cited rules, the project proposer has developed an MMP in accordance with applicable state and federal regulations. This document includes practices that are designed to limit the impacts of the land application of manure, namely applying at agronomic rates, observing setbacks, and restricting the practice of winter time application of manure. The project proposers have chosen to implement the following best management practices (BMP’s) to further mitigate nitrate loss to ground and surface water:

Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/), or documented by thermometer at a depth of six inches.
2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall, before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/), or documented by soil temperature taken by thermometer at a depth of six inches.
4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Apply manure in the spring.

6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

Reason #3: Whether the MMP—allowed practices of over-applying manure and applying manure to croplands featuring sinkholes and other karst features such as fractured bedrock, fissures, sinkholes, and other conduits, have the reasonable potential to cause or contribute to water quality standard exceedances for nitrates and bacteria, rendering the project ineligible for permit coverage and violating 40 C.F.R. §122.44(d)(1).

The applicability of 40 C.F.R. §122.44(d) (1) is a question of law and not a disputed material fact. Nonetheless, the MPCA offers the following in response.

The requestor relies on the assertion of over application of manure to cropland as presented in Reason number 1. A response to that assertion can be found above.

The other contention is that the land application practices have the reasonable potential to cause or contribute to water quality standard exceedances. The requestor has not identified a disputed fact and simply states the areas are underlain by karst susceptible bedrock and its various types of surface and subsurface features (i.e. sinkholes, fractures, etc.) and therefore is an area of heightened sensitivity to impacts from surface activities like land application of manure. The MPCA agrees with this statement and uses an MMP to address these concerns. The project proposer has developed an MMP in accordance with applicable state and federal regulations. This document includes practices that are designed to limit the impacts of the land application of manure, namely through applying at agronomic rates, observing setbacks, and restricting the practice of winter time application of manure.

The requestor also asserts that the MPCA must establish a water quality based effluent limitation for the land application sites, similar to the pollutant load allocations established for point source discharges to water bodies (i.e. wastewater plants). The application of this federal provision to land application sites is a point of law and not a disputed material fact. Furthermore, this provision of federal law is not applicable to agricultural stormwater discharges. The draft permit does not authorize a discharge from land application sites that is not agricultural stormwater. Even though agricultural stormwater discharges are not applicable under this provision of federal law, the NPDES Permit does include conditions related to land application practices not specifically required by state or federal rule in order to minimize potential impacts from agricultural stormwater discharge. These include restrictions for application during winter, application to saturated soils, application to coarse textured soils, and application prior to expected rainfall. The project proposers have chosen to
implement the following BMPs to further mitigate impacts from nitrate loss to ground and surface water and agricultural stormwater discharge:

Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: https://app.gisdata.mn.gov/mda-soiltemp/, or documented by thermometer at a depth of six inches.
2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: https://app.gisdata.mn.gov/mda-soiltemp/, or documented by soil temperature taken by thermometer at a depth of six inches.
4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.
5. Apply manure in the spring.
6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.
7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

Reason #4: The Project’s MMP will result in discharges to waters of the U.S. through hydrologically connected groundwaters, rendering the project ineligible for permit coverage and violating Minn. R. 7020.2003, subp. 2.

The applicability of Minn. R. 7020.2003, subp. 2 is a question of law and not a disputed material fact. Nonetheless, the MPCA offers the following in response.

Minn. R. 7020.2003 subp. 2 is only applicable to an animal feedlot or manure storage area, not land application sites. The definition of animal feedlot in Minn. Rule 7020 reads as such: “Animal feedlot means a lot or building or combination of lots and buildings intended for the confined feeding, breeding, raising, or holding of animals and specifically designed as a confinement area in which manure may accumulate, or where the concentration of animals is such that a vegetative cover cannot be maintained within the enclosure. For purposes of these parts, open lots used for the feeding and rearing of poultry (poultry ranges) shall be considered to be animal feedlots. Pastures shall not be considered animal feedlots under these parts.” The definition of manure storage area in Minn. Rule 7020 reads as such: “Manure storage area means an area where animal manure or process wastewaters are stored or processed. Short-term and permanent stockpile sites and
composting sites are manure storage areas. Animal manure packs or mounding within the animal holding area of an animal feedlot that are managed according to part 7020.2000, subpart 3, are not manure storage areas.” Neither of these definitions include land application areas.

The arguments presented are all related to land application of manure and therefore would not be subject to the rule parts cited, rendering them moot.

Land application discharges are regulated by the NPDES Permit program unless they are agricultural stormwater discharges. 40 CFR 122.23 (e) reads “Land application discharges from a Concentrated Animal Feeding Operation (CAFO) are subject to NPDES requirements. The discharge of manure, litter, or process wastewater to waters of the United States from a CAFO as a result of the application of that manure, litter, or process wastewater by the CAFO to land areas under its control is a discharge from that CAFO subject to NPDES Permit requirements, except where it is an agricultural storm water discharge as provided in 33 U.S.C. 1362(14). For purposes of this paragraph, where the manure, litter, or process wastewater has been applied in accordance with site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter or process wastewater, as specified in §122.42(e)(1)(vi)-(ix), a precipitation-related discharge of manure, litter, or process wastewater from land areas under the control of a CAFO is an agricultural stormwater discharge.” The draft permit does not authorize a discharge from land application sites that is not agricultural stormwater. Therefore, unless there is non-compliance with the permit, the facility will comply with the discharge standards in state and federal rule.

The project proposer has developed an MMP in accordance with applicable state and federal regulations. This document includes practices that are designed to limit the impacts of the land application of manure, namely applying at agronomic rates, observing setbacks, and restricting the practice of winter time application of manure. The project proposers have chosen to implement the following BMPs to further mitigate impacts from nitrate loss to ground and surface water and agricultural stormwater discharge:

Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: https://app.gisdata.mn.gov/mda-soiltemp/, or documented by thermometer at a depth of six inches.
2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: https://app.gisdata.mn.gov/mda-soiltemp/, or documented by soil temperature taken by thermometer at a depth of six inches.
4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing
season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Apply manure in the spring.

6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

Reason #5: The MMP’s allowed practices of overapplying manure and applying manure to croplands featuring sinkholes and other karst features will cause or contribute to a violation of water quality standards and for which the state has performed a pollutant load allocation, where the agency has not demonstrated there are sufficient remaining pollutant load allocations to allow for the new discharge, in violation of 40 C.F.R. § 122.4(i) and state law.

The applicability of 40 C.F.R. § 122.4(i) is a question of law and not a disputed material fact. Nonetheless, the MPCA offers the following in response.

Pollutant load allocations are designated for point source discharges, such as a wastewater treatment plant. The production area of a permitted CAFO (i.e. animal holding areas, manure storage areas, etc.) is assigned a load allocation of zero as it is considered a point source. The proposed facility is designed to meet the zero load allocation assigned to it. In regards to the land application sites, as discussed in the responses to Issues 2, 3, and 4, the draft permit only authorizes agricultural stormwater discharge from the land application sites. Agricultural stormwater is not a point source discharge, it is a non-point discharge. Total maximum daily loads (TMDLs) manage non-point discharges, such as agricultural stormwater, through the use of BMPs and MMPs to help limit impacts from these sources. The draft permit and Project’s MMP are consistent with applicable TMDLs. The project proposers have chosen to implement the following BMPs to further mitigate impacts from nitrate loss to ground and surface water and agricultural stormwater discharge:

Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: https://app.gisdata.mn.gov/mda-soiltemp/, or documented by thermometer at a depth of six inches.

2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.

3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: https://app.gisdata.mn.gov/mda-soiltemp/, or documented by soil temperature taken by thermometer at a depth of six inches.

4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in
the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Apply manure in the spring.

6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

Reason #6: The MMP endangers human health and the danger cannot be removed by a modification of the conditions of the permit.

The requestor cites Minn. R. 7001.0140 subp 2. prohibits issuance of the proposed permit due to the public health threat the project creates. The applicability of Minn R. 7001.0140 subp 2. is a question of law and not a disputed material fact. Nonetheless, the MPCA offers the following in response.

The requestor again fails to identify a disputed material fact. The main issues identified by the requestor are:

- The area is underlain by karst susceptible bedrock and is therefore more vulnerable to impacts from land application of manure;
- The project is in an area of high sinkhole probability;
- There are TMDLs in the area influenced by agricultural pollutants;
- Many wells in the area have high nitrate levels; and
- The public water supply for Utica is within two miles and some land application sites are within the Drinking Water Supply Management Area (DWSMA).

The MPCA acknowledges these issues, therefore, there are no disputed facts for which a contested case hearing would be warranted. The Feedlot Permit and Project MMP contains requirements and management practices that mitigate these items. Some of the requirements found in the Feedlot Permit and management practice in the Project’s MMP that mitigate concerns relating to the items noted include:

a) Manure cannot be applied to land in a manner that will result in a discharge to waters of the state during the application process.

b) The rate at which manure is applied cannot exceed the hydraulic loading capacity of the land application site based on soil conditions.

c) The application of manure at rates so the estimated nitrogen available to crops from all nitrogen sources (including commercial fertilizer) does not exceed expected annual crop nitrogen needs for non-legumes and expected nitrogen removal for legumes.

d) Manure application is prohibited within 100 feet of a well, mine, or quarry.

e) Manure application is prohibited within 300 feet of a sinkhole unless one of the following protective measures is employed:
1. Manure is not applied within 100 feet of the sinkhole and manure is injected or incorporated prior to rainfall or within 24 hours (whichever occurs first) within 300 feet of the sinkhole; or
2. A protective berm exists that prohibits runoff from entering the sinkhole.

f) The Project Proposer's MMP indicates manure will either be directly injected into the soil or incorporated into soil within 24 hours of application and prior to rainfall.

Furthermore, the project proposer has recognized the issues cited by the requestor and made adjustments to the MMP to further minimize potential impacts from the project proposal; these include:

Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: https://app.gisdata.mn.gov/mda-soiltemp/, or documented by thermometer at a depth of six inches.
2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website: https://app.gisdata.mn.gov/mda-soiltemp/, or documented by soil temperature taken by thermometer at a depth of six inches.
4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.
5. Apply manure in the spring.
6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.
7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

FINAL DETERMINATION ON ISSUANCE OF PERMIT COVERAGE OF DALEY FARMS OF LEWISTON LLP, DALEY FARMS OF LEWISTON LLP 1, DALEY FARMS OF LEWISTON LLP 7 UNDER THE INDIVIDUAL NPDES FEEDLOT PERMIT

37. The MPCA's decision to issue coverage under the Individual NPDES Feedlot Permit for the Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7 feedlot sites are governed by its permit rule, Minn. R. 7001.0140, subp. 1. which states:
Except as provided in subpart 2, the agency shall issue, reissue, revoke and reissue, or modify a permit if the agency determines that the proposed permittee or permittees will, with respect to the facility or activity to be permitted, comply or will undertake a schedule of compliance to achieve compliance with all applicable state and federal pollution control statutes and rules administered by the agency, and conditions of the permit and that all applicable requirements of Minnesota Statutes, chapter 116D, and the rules adopted under Minnesota Statutes, chapter 116D, have been fulfilled.

38. Minn. R. 7001.0140, subp 2., states:

The following findings by the agency constitute justification for the agency to refuse to issue a new or modified permit, to refuse permit reissuance, or to revoke a permit without reissuance:

A. that with respect to the facility or activity to be permitted, the proposed permittee or permittees will not comply with all applicable state and federal pollution control statutes and rules administered by the agency, or conditions of the permit;
B. that there exists at the facility to be permitted unresolved noncompliance with applicable state and federal pollution control statutes and rules administered by the agency, or conditions of the permit and that the permittee will not undertake a schedule of compliance to resolve the noncompliance;
C. that the permittee has failed to disclose fully all facts relevant to the facility or activity to be permitted, or that the permittee has submitted false or misleading information to the agency or to the Commissioner;
D. that the permitted facility or activity endangers human health or the environment and that the danger cannot be removed by a modification of the conditions of the permit;
E. that all applicable requirements of Minn. Stat. ch. 116D and the rules adopted under Minn. Stat. ch. 116D has not been fulfilled;
F. that with respect to the facility or activity to be permitted, the proposed permittee has not complied with any requirement under parts 7002.0210 to 7002.0310 or chapter 7046 to pay fees; and
G. that with respect to the facility or activity to be permitted, the proposed permittee has failed to pay a penalty owed under Minn. Stat. § 116.072.

39. The Proposer has submitted complete applications. These applications have been reviewed and preliminarily approved by MPCA staff and demonstrate that all environmental protection standards will be satisfied.

40. The MPCA finds that the proposed issuance of permit coverage under the Feedlot Permit for the Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7 feedlot sites, as public noticed on October 1, 2018, through November 15, 2018, meets the requirements of Minn. R. 7001.0140. The MPCA has reasonable assurance based on the information submitted, that proper operation of the facilities in compliance with the requirements of the permit and completion of all required monitoring in accordance with the conditions of the permit issued by this Order, will achieve compliance with all applicable state and federal pollution control statutes and rules and the conditions of the permit, and will not pose a danger to human health or the environment.
CONCLUSIONS OF LAW

41. The MPCA has jurisdiction over the decision whether to issue permit coverage under the Feedlot Permit for the Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7 feedlot sites.

42. The MPCA has jurisdiction over the decision whether to grant or deny the request for a CCH for the proposed modification of permit coverage under the Feedlot Permit for the Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7 sites.

43. For the reasons set forth in this document, the requirements of Minn. R. 7000.1800, subp. 2(A) and Minn. R. 7001.1900, subp. 1 (A) have not been met with respect to the issues raised by the MCEA request for a CCH on the permit coverage under the Feedlot Permit for the Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7 feedlot sites. Therefore, the request for a contested case hearing is denied.

44. Due, adequate, and timely public notice of the proposed modification of permit coverage under the Feedlot Permit for the Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7 feedlot sites was given in accordance with Minn. R. 7001.0100.

45. The requirements set forth in Minn. R. 7001.0140 for modification of the notice of coverage under a Feedlot Permit and issuance of the notice of coverage under the Feedlot Permit are satisfied. Therefore, the modified permit coverage under the Feedlot Permit for the Proposer's Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7 feedlot sites should be issued.

46. Any findings that might properly be termed conclusions and any conclusions that might properly be termed findings are hereby adopted as such.

ORDER

47. The Minnesota Pollution Control Agency determines that the issues raised by the contested case hearing request do not meet the requirements of Minn. R. 7000.1800, subp. 2(A) and Minn. R. 7000.1900, subp. 1 (A) for granting a contested case hearing. The Minnesota Pollution Control Agency denies the requests for a contested case hearing.

48. The Minnesota Pollution Control Agency approves and authorizes modification of permit coverage under the Feedlot Permit for the Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1, and Daley Farms of Lewiston LLP 7 feedlot sites.

IT IS SO ORDERED

[Signature]
John Linc Stine, Commissioner
Minnesota Pollution Control Agency

[Date]
LIST OF COMMENT LETTERS RECEIVED ON THE EAW AND FEEDLOT PERMIT

7. Paul Doran. Email received October 19, 2018.
17. Haley O’Neill. Email received November 1, 2018.
18. Joan Buske. Email received October 30, 2018.
22. Dan and Donna. Email received October 30, 2018.
24. Kim Hiltner. Email received October 30, 2018.
26. Dean Borgeson. Email received October 30, 2018.
27. Michelle Wilkes. Email received October 30, 2018.
29. Marco Polo. Email received October 30, 2018.
30. Dayna Burtness. Email received October 30, 2018.
31. Thomas Walsh. Email received October 30, 2018.
32. Laura Dillon. Email received October 30, 2018.
33. Lorraine Redig. Email received October 30, 2018.
34. Vincent Ready. Email received October 30, 2018.
35. Robert Goetz. Email received October 30, 2018.
36. Mary Baird. Email received October 30, 2018.
37. Barbara Veit. Email received October 30, 2018.
38. Phoebe Ruona. Email received October 30, 2018.
40. Kurt Kimber. Email received October 30, 2018.
41. Roslyn Hjermstad. Email received October 30, 2018.
42. Sonja Trom Eayrs. Email received October 30, 2018.
43. DeeAnn Stenlund. Email received October 30, 2018.
44. Sonja Trom Eayrs, on behalf of Dodge County Concerned Citizens. Email received October 30, 2018.
45. Diane J. Peterson. Email received October 30, 2018.
46. Jake Stacken. Email received October 30, 2018.
47. Anna Racer. Email received October 30, 2018.
48. Peggy Endres. Email received October 30, 2018.
49. Henry Homburger. Email received October 30, 2018.
50. Donna Martinson. Email received October 30, 2018.
51. Kally Goschke. Email received October 30, 2018.
52. Joline Gitis. Email received October 30, 2018.
53. Stan Sattinger. Email received October 30, 2018.
54. Gretchen Bratvold. Email received October 31, 2018.
55. Nancy Palmer. Email received October 31, 2018.
56. Jesgroebner. Email received October 31, 2018.
58. Theresa Zeman. Email received October 31, 2018.
60. Dean Flugstad. Email received October 31, 2018.
61. Mary Jo Bibby. Email received October 31, 2018.
62. Catherine Steffens. Email received October 31, 2018.
63. Dale Hadler. Email received October 31, 2018.
64. Richard Dahl. Email received October 31, 2018.
65. Tiffany Reinitz. Email received October 31, 2018.
66. Carol Ashley. Email received October 31, 2018.
67. Annette Homburger. Email received October 31, 2018.
68. Frank Bures. Email received October 31, 2018.
69. Don Walser. Email received October 31, 2018.
70. RedHeart RedHeart. Email received October 31, 2018.
71. Stan Smith. Email received October 31, 2018.
72. ML Wilm. Email received October 31, 2018.
73. Jennifer Rupprecht. Email received October 31, 2018.
74. Mike Ruppredht. Email received October 31, 2018.
75. Roy House. Email received October 31, 2018.
76. Dana Jackson. Email received October 31, 2018.
77. Robert Munneke. Email received October 31, 2018.
78. Julie Gordon. Email received October 31, 2018.
79. Megan Falvey. Email received October 31, 2018.
82. Wendy Larson. Email received October 31, 2018.
83. Eric Utne. Email received October 31, 2018.
84. Aaron Thompson. Email received October 31, 2018.
85. Janice Kittok. Email received October 31, 2018.
86. John King. Email received October 31, 2018.
87. Loni Kemp. Email received October 31, 2018.
88. Barb Nagel. Email received October 31, 2018.
89. Robert Benson. Email received October 31, 2018.
90. Virginia Templeton. Email received October 31, 2018.
91. Emily Falc and leadership team of the Winona Climate Action Network.
   Email received October 31, 2018.
93. Leslea Hodgson. Email received October 31, 2018.
95. Hootch Hanson. Email received October 31, 2018.
96. Jean and Mark Reisetter. Email received October 31, 2018.
97. Mark M. Giese. Email received October 31, 2018.
98. Linda D'Amico. Email received October 31, 2018.
100. Mabel Nichols. Letter received October 25, 2018.
104. Jean Schilling. Email received October 30, 2018.
105. Mary Voight. Email received October 30, 2018.
106. Stuart Malanaphy. Email received October 30, 2018.
107. Angela Anderson. Email received October 30, 2018.
108. Lawrence Krantz. Email received October 30, 2018.
110. Jean Greenwood. Email received October 30, 2018.
111. Elizabeth Oness. Email received October 30, 2018.
112. Sue Griebel. Email received October 30, 2018.
113. Gene Kremer. Email received October 30, 2018.
115. Edward Lagace. Email received October 30, 2018.
118. Eric Nelson. Email received October 30, 2018.
119. Jan Dahl. Email received October 30, 2018.
120. Bruno Bonsari-2. Email received October 30, 2018.
121. Loretta Jaus. Email received October 30, 2018.
122. Mike Kennedy. Email received October 30, 2018.
123. Nancy Conger. Email received October 30, 2018.
125. Chris Peckover. Email received October 30, 2018.
126. Jennifer Cantine. Email received October 30, 2018.
127. Michelle Gobely. Email received October 30, 2018.
128. Margot Monson. Email received October 30, 2018.
129. Dorothy Dolezal. Email received October 30, 2018.
130. Laura Inman. Email received October 30, 2018.
131. Sarah Orman. Email received October 30, 2018.
132. Dorothy Kloehn. Email received October 30, 2018.
133. Ken Lyons. Email received October 30, 2018.
134. Carolyn Carr. Email received October 30, 2018.
135. Elizabeth Jarrett Andrew. Email received October 30, 2018.
136. Margaret Mahoney. Email received November 5, 2018.
137. Donald Greenebaum. Email received November 4, 2018.
139. Mark Martin. Email received November 4, 2018.
140. Kathleen Felt. Email received November 4, 2018.
142. Virginia Templeton. Email received November 3, 2018.
143. Gary Johnson. Email received November 3, 2018.
144. Clinton Carl Hertle Hertle. Email received November 3, 2018.
146. Wendy Haan. Email received November 3, 2018.
147. Grant Will. Email received November 3, 2018.
149. Jennifer Therkilsen. Email received November 2, 2018.
150. Mary Melbo. Email received November 2, 2018.
151. Christopher Loetscher. Email received November 2, 2018.
152. Merry Sawdey. Email received November 2, 2018.
153. Virginia Mackay. Email received November 2, 2018.
154. Bonnie Beckel. Email received November 2, 2018.
155. Keith Johnson. Email received November 2, 2018.
156. Sally Vogel. Email received November 2, 2018.
157. Christina Schmitt. Email received November 2, 2018.
158. Bruce Gockowski. Email received November 2, 2018.
159. Mark Hustad. Email received November 2, 2018.
160. Lynn Nankivil. Email received November 2, 2018.
161. Shirley Espeland. Email received November 2, 2018.
162. Barbara Prokop. Email received November 2, 2018.
164. Michael Haldeman. Email received November 2, 2018.
165. George Johnson. Email received November 2, 2018.
166. Jim Schumer. Email received November 2, 2018.
167. C. John Hildebrand. Email received November 2, 2018.
168. Michelle Gobely. Email received November 2, 2018.
169. Brian Wojtalewicz. Email received November 2, 2018.
170. Damien Londino-Green. Email received November 2, 2018.
171. Joyce Genis. Email received November 2, 2018.
172. Laura Frerichs. Email received November 2, 2018.
173. John White. Email received November 2, 2018.
174. Ruth Bures. Email received November 2, 2018.
175. Sharon Schmidt. Email received November 1, 2018.
177. Sarah Beimers, Minnesota Department of Administration, State Historic Preservation Office. Letter received November 5, 2018.
184. Lynn Domeier-Connolly. Online submittal received October 8, 2018.
186. Erin Moffit. Online submittal received October 8, 2018.
187. Chad Theede. Online submittal received October 8, 2018.
188. Amanda Domeier. Online submittal received October 8, 2018.
189. Mary Domeier. Online submittal received October 8, 2018.
190. Kevin. Online submittal received October 8, 2018.
191. Mike Buringa. Online submittal received October 8, 2018.
194. George Droogsma. Online submittal received October 8, 2018.
197. Taylor Bartelson. Online submittal received October 8, 2018.
199. Austin Liepold. Online submittal received October 8, 2018.
201. Dustin Rohe. Online submittal received October 8, 2018.
203. Devin Banitt. Online submittal received October 9, 2018.
204. Jesse Ellinghuysen. Online submittal received October 9, 2018,
206. Lee Kloekchner. Online submittal received October 9, 2018.
207. Lori LaBrec. Online submittal received October 9, 2018.
208. Dave Riebel. Online submittal received October 9, 2019.
209. Mitch Thompson. Online submittal received October 9, 2018.
211. No name given. Online submittal received October 10, 2018.
215. Amber Sass. Online submittal received October 10, 2018
218. Tom Theede. Online submittal received October 11, 2018.
220. Scott Ellinghuysen. Online submittal received October 12, 2018.
221. Lee Ihrke. Online submittal received October 12, 2018.
222. Wendy Badenhorst. Online submittal received October 12, 2018.
223. Wade Gustafson. Online submittal received October 12, 2018.
228. Laura McDonough. Online submittal received October 13, 2018.
230. Mary Hansel. Online submittal received October 14, 2018.
231. Brent and Polly Greden. Online submittal received October 14, 2018.
232. John Fritts. Online submittal received October 14, 2018.
243. No name or comment given, received October 16, 2018.
244. Elias Anoszko. Online submittal received October 17, 2018.
248. Cameron Kennedy. Online submittal received October 18, 2018.
250. Mary Hansel. Online submittal received October 19, 2018.
254. Alex Romano. Online submittal received October 19, 2018.
256. Lynn Glesne. Online submittal received October 19, 2018.
259. Tom van der Linden. Online submittal received October 19, 2018.
263. Steve Sandberg. Online submittal received October 19, 2018.
266. Beth Tamminen. Online submittal received October 19, 2018.
269. Mary Vlazny. Online submittal received October 19, 2018.
270. Mary Voight. Online submittal received October 19, 2018.
274. Elizabeth Oness. Online submittal received October 19, 2018.
275. Mary Farrell. Online submittal received October 19, 2018.
278. Linda O’Neill DeRemee. Online submittal received October 20, 2018.
280. Margaret Merkow. Online submittal received October 20, 2018.
283. Sylvia Borgmeier. Online submittal received October 20, 2018.
284. Milo Oien-Rochat. Online submittal received October 20, 2018.
286. Sara Gjerdrum. Online submittal received October 20, 2018.
287. Eva Barr. Online submittal received October 20, 2018.
288. Allan LaValier. Online submittal received October 20, 2018.
290. Scott Kerl. Online submittal received October 20, 2018.
291. Suzanne Swanson. Online submittal received October 20, 2018.
293. Larry Jungwirth. Online submittal received October 20, 2018.
296. Angela Anderson. Online submittal received October 22, 2018.
299. Sylvia Borgmeier. Online submittal received October 22, 2018.
300. Gayle Anderson. Online submittal received October 22, 2018.
301. Dee Czech. Online submittal received October 22, 2018.
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308. Daryl Buck. Online submittal received October 24, 2018.
311. Christopher Loch. Online submittal received October 24, 2018.
313. Sharon DePestel. Online submittal received October 25, 2018.
316. Shannon Martin. Online submittal received October 26, 2018.
326. Jim Riddle. Online submittal received October 31, 2018.
328. Shona Snater. Online submittal received October 31, 2018.
329. Terry Houle. Online submittal received October 31, 2018.
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Elizabeth Mitchell. Online submittal received October 31, 2018.
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Kim Schermer. Online submittal received November 1, 2018.
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Thomas Szyszkiewicz. Online submittal received November 1, 2018.
Diane Leutgeb Munson. Online submittal received November 2, 2018.
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Melia Haugen. Online submittal received November 3, 2018.
Karen Neenan. Online submittal received November 5, 2018.
Merry Sawdey. Email received November 13, 2018.
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Kelly Karstad. Email received November 13, 2018.
Bridget Levin. Email received November 13, 2018.
Kurt Schulz. Email received November 13, 2018.
Bonita Schwartz. Email received November 13, 2018.
Nancy C. Palmer. Email received November 13, 2018.
Barbara Norblom. Email received November 13, 2018.
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Jacquelyn Warren. Email received November 13, 2018.
Kelsey Koch. Email received November 12, 2018.
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Karen Nielsen. Email received November 10, 2018.
Billy Gurmano. Email received November 10, 2018.
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Jeremy Wales. Email received November 9, 2018.
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Christine Harshman. Email received November 9, 2018.
Scott Olson. Email received November 9, 2018.
Renee Walz. Email received November 9, 2018.
Kristine Hall. Email received November 9, 2018.
382. Rhyan Schicker. Email received November 9, 2018.
383. Dan Hooley. Email received November 9, 2018.
384. Gail Bradford. Email received November 9, 2018.
385. Cheryl Peterson. Email received November 9, 2018.
386. Danielle Hernandez. Email received November 9, 2018.
387. Dawn Pesicka. Email received November 9, 2018.
388. John Brown. Email received November 9, 2018.
389. Cleeson Mill. Online submittal received November 6, 2018.
391. Lee Rain. Online submittal received November 6, 2018.
392. Glen Groth. Online submittal received November 6, 2018.
394. Roberta Bumann. Online submittal received November 7, 2018.
395. Larry Hampel. Online submittal received November 7, 2018.
400. Jim Reinhardt. Online submittal received November 11, 2018.
403. Don Nordby. Online submittal received November 12, 2018.
408. Margaret Walsh. Online submittal received November 13, 2018.
411. William Davis. Online submittal received November 14, 2018.
413. Dayna Burtness. Online submittal received November 15, 2018.
419. Carol Thompson. Online submittal received November 15, 2018.
422. Rita Young. Online submittal received November 15, 2018.
423. John Lenczewski. Online submittal received November 15, 2018. (DUPLICATE)
425. Tina Gronquist. Email received November 9, 2018.
426. Barbara Courneya. Email received November 9, 2018.
427. Wayne Potratz. Email received November 9, 2018.
428. Walter Wegner. Email received November 9, 2018.
430. Nora Moore. Email received November 9, 2018.
431. Joshua Howe. Email received November 9, 2018.
432. Juey Brommerich. Email received November 7, 2018.
433. Karen Swanson. Email received November 6, 2018.
434. Melissa Gordon. Email received November 5, 2018.
435. Lois Kozlowski. Email received November 13, 2018.
436. Lynnea Pfohl. Email received November 13, 2018.
437. Anne Wildenborg. Email received November 13, 2018.
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439. Sheila Maybanks. Email received November 13, 2018.
441. Mary Vlazny. Email received November 13, 2018.
442. Sharon Kutter. Email received November 13, 2018.
443. Nancy Sogabe-Engelmayer. Email received November 13, 2018.
444. Curtis Speck. Email received November 13, 2018.
446. Lynne Anderson. Email received November 13, 2018.
449. Steward Day. Email received November 13, 2018.
450. Mary Melbo. Email received November 13, 2018.
452. Wendy Hagen. Email received November 13, 2018.
453. Michelle Gobely. Email received November 13, 2018.
454. Virginia Mackay. Email received November 13, 2018.
455. Leo Klisch. Email received November 13, 2018.
458. S.E. Email received November 13, 2018.
459. Debra Sluis. Email received November 13, 2018.
460. Sandra Webb. Email received November 13, 2018.
461. Blanchard and Doris Krogstad. Email received November 13, 2018.
462. Mike Kennedy. Email received November 13, 2018.
466. Lynn Albrecht. Email received November 13, 2018.
467. Thomas Harries. Email received November 13, 2018.
468. Chris Hughes. Email received November 13, 2018.
469. Elsie Kyllo. Email received November 13, 2018.
470. Joe Lineweaver. Email received November 13, 2018.
471. Katherine Clinch. Email received November 13, 2018.
472. Florence Hedeen. Email received November 13, 2018.
473. Ron Pribyl. Email received November 13, 2018.
474. Diane Boushek. Email received November 13, 2018.
475. Marie Piltingsrud. Email received November 13, 2018.
476. Donna Butler. Email received November 13, 2018.
477. Charles and Marilyn Magnuson. Email received November 13, 2018.
478. Ron Kroese. Email received November 13, 2018.
529. Starr Brainard. Email received November 14, 2018.
530. Rafael Bustos. Email received November 14, 2018.
531. Gretchen Bratvold. Email received November 14, 2018.
532. Wayne Hervey. Email received November 13, 2018.
533. Melissa Hochstetler. Email received November 13, 2018.
534. Joan Meierotto. Email received November 13, 2018.
535. Mark M. Giese. Email received November 13, 2018.
536. Alec Nord. Email received November 13, 2018.
538. Mary Voigt. Email received November 13, 2018.
541. Darcy Bergh. Email received November 13, 2018.
543. Doug Ploof. Email received November 13, 2018.
545. Mary Baird. Email received November 13, 2018.
546. Wendy Peardot. Email received November 13, 2018.
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548. Sylvia Luetmer. Email received November 13, 2018.
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552. Janet Kortuem. Email received November 13, 2018.
553. Ginny Halloran. Email received November 13, 2018.
554. Sheryl Samuel. Email received November 13, 2018.
555. Milo Oien-Rochat. Email received November 13, 2018.
556. Kathleen Blake. Email received November 13, 2018.
557. Gloria Degele. Email received November 13, 2018.
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561. Dorothy Dolezal. Email received November 13, 2018.
562. Randy Baker. Email received November 13, 2018.
563. Sally Vogel. Email received November 13, 2018.
564. Joshua Otte. Email received November 14, 2018.
566. Kellie Hoyt. Email received November 14, 2018.
567. Joan Stockinger. Email received November 14, 2018.
568. Diana Brainard. Email received November 14, 2018.
569. Vincent Ready. Email received November 14, 2018.
570. Vincent Ready. Email received November 14, 2018.
571. Amy Cordry. Email received November 14, 2018.
572. Deborah L. Nichols. Email received November 15, 2018.
573. Richard Harle. Email received November 15, 2018.
574. Margaret Walsh. Email received November 15, 2018.
575. Patrick Byron. Email received November 15, 2018.
Mary Tacheny. Email received November 14, 2018.
Madeline Neenan. Email received November 15, 2018.
John Zschetzsche. Email received November 15, 2018.
Eva Barr. Email received November 15, 2018.
Alan Muller. Email received November 15, 2018.
Peg Zahorik. Email received November 15, 2018.
John P. Lenczewski. Email received November 15, 2018.
Pat Schmieder. Email received November 15, 2018.
Johanna Rupprecht. Email received November 15, 2018.
Dennis Johnson. Email received November 15, 2018.
Barbara Sogn-Frank. Email received November 15, 2018.
Aleta Borrud. Email received November 15, 2018.
Ryan Franke. Email received November 15, 2018.
Mark Erickson. Email received November 15, 2018.
Sandra D. Jones. Email received November 15, 2018.
Janette Dean. Email received November 15, 2018.
Becky Ault. Email received November 15, 2018.
Calvin Alexander. Email received November 15, 2018.
Lynn Theurer. Email received November 15, 2018.
Denise Zabinski. Email received November 15, 2018.
Carly McGinty, Winona County Feedlot Officer. Email received November 15, 2018.
Arthur Hawkins. Email received November 15, 2018.
Becky Horton, Minnesota Department of Natural Resources. Email received November 15, 2018.
Jill Crafton. Email received November 15, 2018.
John King. Email received November 15, 2018.
Nancy Wagner. Email received November 15, 2018.
Tom Richards. Email received November 15, 2018.
Lizzy Haywood. Email received November 15, 2018.
Mary Lundell. Email received November 15, 2018.
Scott Lowery. Email received November 14, 2018.
Hilary Reeves. Email received November 14, 2018.
Bonnie Nord. Email received November 14, 2018.
Roger Wacek. Email received November 14, 2018.
Keith Johnson. Email received November 14, 2018.
Laurie Hugen-Eitzman. Email received November 14, 2018.
Ryan Ronchak. Email received November 14, 2018.
Judith Moore. Email received November 14, 2018.
Douglas Anderson. Email received November 14, 2018.
Bonnie Haugen. Email received November 14, 2018.
Cherie Hales. Email received November 14, 2018.
Melissa Maher. Email received November 14, 2018.
Kim Grosenheider  
MPCA  
520 Lafayette Road N.  
St. Paul, MN 55155-4194  

Re: Application by Daley Farm of Lewiston, MN plans to more than double the number of cows  

Dear Ms. Grosenheider—  

I read in the Oct. 7, 2018 edition of the Mpls. StarTribune, about the application before the MPCA (and other bodies) by the Daley family of Lewiston to radically increase their dairy feedlot operation. The article indicates these are good, hardworking people.  

I for one hope that the state rejects the Daley permit application to greatly expand their feedlot operations. I believe it was Gov. Jesse Ventura’s administration that first allowed the expansion of feedlots in MN. Since then, groundwater has become further contaminated by ag operations, nearby neighbors swoon from the stench emanating from their neighbor’s cattle and hog feedlots, and "accidents" at manure lagoons cause untold millions of gallons of swill to penetrate groundwater and streams.  

A better solution would be to once again encourage animal operations be part of small and medium sized farms—where pasture grazed animals would spread manure in a more natural way—and reduce the concentration of animal confinement compared to feedlots.  

A concerted effort SHOULD also be made to require feedlots over a certain size to install anaerobic manure digesters.  


Install anaerobic digesters would partially treat the sewage, and recover methane gas—a major contributor to climate change. The captured methane can be used to generate on site heat or electricity. The digester will also reduce pathogens in the effluent, and reduce odors wafting to nearby neighbors. Using a state or federal loan program to finance these digesters, operators who build them report that they pay back the initial investment and then continue to reap both benefits to the environment and to the bottom line.  

State and local regulators need to halt the spread of "business as usual" feedlot operations in our state. The environment is already overtaxed by their proliferation, and, if an operator goes under, who then is responsible for cleaning up their contaminated feedlot?  

Regards,  

Bruce Clark
October 12, 2018

MS Kim Grosenheider  
MCPA  
520 Lafayette Road North  
St. Paul, MN  55155-4194

RE: Daley Farm, Lewiston, MN  55952

Dear MS Grosenheider:

As an Independent Appraiser, I have had the opportunity to view a number of dairy operations in Iowa, Minnesota, and Wisconsin. I have observed the operation of Daley Farm as being responsible stewards of their land, humane in the management of their dairy herds, and on the leading edge of manure management.

I would recommend that your agency proceed in a positive manner with the Daley Farm application.

Very Respectfully,

John F. Campe, Minnesota License # 20049866  
Certified General Real Property Appraiser

CC: Winona County Commissioners, Senator Jeremy Miller
I could write pages but I'll keep it short.

I am asking MPCA to be as considerate to the citizens of SE MN who register concern to your office as you've been to the Dalys who are proceeding with their dairy expansion - E.A.W. even... The animal Cap in Winona Co is 1500. They've been executing that for 20 years. The way I understand the ordinance it's not even legal to have proceeded to this point. How much time and money has been spent on this project? Located about 1 mi from a city that leaked the entire contents of their municipal sewer facility into the ground water in 1992. Is this Altura and Delano? - Using 92 million gallons of water when the city of Lewiston's water supply is a cocktail of 3 wells in order to comply with contaminant levels. SE Minnesota is NOT the place for this project - you can study and regulate all you want, you simply cannot guarantee that a project of this size will be safe. The well water is already unsafe at many wells in their area. The U.S.A. says that a 250 cow dairy produces as much waste as 5,000 people. EPA says 250 cows = 41,000 people. Do you think that's correct or does MN MPCA know something they don't - Good grief! a home in my area has to put in a 30,000 mound system for a home with 2 people because we live in this Karst Area. AN ENVIRONMENTAL IMPACT STATEMENT!!
Comment Sheet
Proposed Daley Farms expansion
Environmental Assessment Worksheet
and Individual Feedlot Permit Coverage

Your comments!

If you would like to comment on the Environmental Assessment Worksheet (EAW) and Individual Feedlot Permit for Daley Farms' proposed dairy expansion in Winona County, Minnesota, please use this form and mail it to:
Kim Grosenheimer, MPCA, 520 Lafayette Road N., St. Paul, MN 55155. You may also submit comments online: http://survey.mn.gov/s.asp?k=153730433478. Written comments must be received by 4:30 p.m., Oct. 31, 2018.

Our family has known the Daley family for 23 years. They are hard working, respectful and conscientious people. We support their expansion.

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<td>Address (Required. Please print.)</td>
<td>21387 FERGUSON VALLEY DRIVE-</td>
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<td>DEWISON MN 55352</td>
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Comment Sheet
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Nov. 15

I farm and live in Winona and Fillmore Counties.
I recognize that the Daleys and MPCA have already invested lots of time and money in this proposal. And yet, I believe strongly that a project of this magnitude needs the highest possible scrutiny authorized by law... a full environmental impact statement.

I do not doubt that the likelihood of an accident occurring that overwhelms manure management infrastructure... this likelihood is very small. But risk is a function of likelihood and severity of an accident. Having so many cows, so much manure concentrated so closely...

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<td>Winona (Street) MN 55987</td>
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Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194
(651) 296-6300, toll-free (800) 657-3864, TTY (651) 282-5332 or (800) 657-3864
This material can be made available in alternative formats for people with disabilities.
Printed on recycled paper containing at least 30 percent fibers from paper recycled by consumers.
such a tight space... this presents risk of a catastrophic incident for the environment.

How can we understand risk of this magnitude without the highest possible environmental risk review?

Does an EAW really, REALLY consider and rule out potential impact for a 500 year rain event?

16-20" rain on saturated soil, like we had here in 2007?

Can the EAW guarantee that this would not produce overflow/outburst of manure?

What about a tornado passing right over the facility (manure lagoon etc)?

Again... very unlikely. But what would happen if these things like this DID occur??

I do not believe that a simple EAW can possibly anticipate and control environmental effects sufficiently...

Only a full EIS can do this.
Why would anyone want to milk 3000 cows??

Long time ago you could make a living milking 40 cows, then 80 cows, later 160 cows then 250, then 500 cows. Notice a trend here?? This isn’t a local or temporary trend. Right now over 1/3rd of all milk marketed in the U.S. is from herds milking OVER 2000 cows.

Why??

Scale of Economics ..... a lot less money to build a 3000cow dairy than 10 – 300 cow dairies or 30 -100 cow dairies.

With all the new technologies on the market today, managing 3000 cows today is more efficient and feasible than an 80cow herd many years ago.

Because of this trend, Dr. Marin Bozig, a dairy economist for the University of Minnesota said, I anticipate out of the 3000 dairy farmers left in the state of Minnesota, 80% are LAST GENERATION dairy farmers.

That is VERY scarv for me as a dairy farmer and should be for the local economy as well.

What will happen to our local economy when 80% of our local dairy farms are gone?? What will happen to Vet clinic, local feed dealers and dairy equipment repair businesses and all the people and families that these businesses support?? How about the school districts and county budgets??

The economic activity from dairy herds is between $10,000 to $12,000 PER COW PER YEAR, depending on which economist you consult.

That is a lot of money for our state, county and school districts.

I’m sure there are going to be people who speak in opposition to this proposal, that opposition is likely based out of a misunderstanding of how large farms are operated, regulated and managed.

Some groups use fearmongering to get attention to their cause, they try to SCARE people from the unknown or unusual, like the first large dairy in the county.

That is why we have the M.P.C.A. to make sure our natural resources in the area are preserved for our future generations.

I would like to thank the Daley family for all they have done for the community they have been a part of for many generations and wish them all the best in the future.

Thanks,

Becky Clark
Good Morning Kim,

My name is Paul Doran and my family and I have been residents of Lewiston for 40+ years. I’ve also been a business owner in Lewiston for over 40 years.

I’m contacting you today regarding the proposed Daley farm expansion west of the city. I’d like to express support in allowing them to move forward with the expansion. The Daley’s have a long history of doing “what is right” and I have complete confidence that they would continue doing so moving forward with the expansion. This is a well educated family and they are definitely aware that they need to protect all natural resources for their neighbors as well as themselves. I’m confident they will take every precaution moving forward to use safe farming practices.

The Daley family has been a huge contributor in every way to Lewiston and the Lewiston Area. I spend a large amount of time within the community and in local businesses and I can assure you the support for the expansion project is overwhelming. Unfortunately most people aren’t willing to take the time to contact you but I do talk to a large number of people running my business and I’ve yet to talk to anyone opposed to the expansion.

It would very unfair to stop a local family business from expanding to allow the younger generation to get involved.

Trust the Daley’s will do everything possible to keep our environment safe and continue to be good stewards of the land.

Thanks,
Paul Doran
Kim Grosenheider  
MPCA  
520 Lafayette Rd. N.  
St Paul MN 55155-4194

Kim: I am writing to oppose approval of an increase in cows at the Daley farm in Lewiston, Minnesota. The Daley family is already allowed to exceed the county limits. If they are allowed to increase their herd, how would the county be able to deny others to do the same?

I live in Wilson township. Our water was tested about a year ago and we have nitrates and traces of 4 pesticides present. If our water is showing signs of agricultural contamination with just normal sized farms, how much of a risk are the Daley's potentially causing? Please do not allow this enormous increase in cows which will threaten our water and quality of life in Winona County.

Sincerely,
Lorette Boyer
Kim Grosenheider:

I unequivocally oppose the radical Daley Farm expansion proposal.

An Environmental Impact Statement must be required. After the completion of an Environmental Impact Statement, I may reconsider my opposition to the Daley proposal. A reconsideration will be based on the competence of the scientists doing the EIS, and a citizens review of their research. Until the EIS is completed, I unequivocally oppose the Daley Farm proposal.

Cordially,

Richard Stephen Schwartz
Comment Sheet
Proposed Daley Farms expansion
Environmental Assessment Worksheet
and Individual Feedlot Permit Coverage

Your comments!
If you would like to comment on the Environmental Assessment Worksheet (EAW) and Individual Feedlot Permit for Daley Farms’ proposed dairy expansion in Winona County, Minnesota, please use this form and mail it to:
Kim Groenheider, MPCA, 520 Lafayette Road N., St. Paul, MN 55155. You may also submit comments online: http://survey.mn.gov/s.asp?k=153730433478. Written comments must be received by 4:30 p.m., Oct. 31, 2018.

Reasons to require an EIS on the Daley Farm expansion:
Utica township has 46% of its wells over 10mg/L Nitrate.
St. Charles township has 34% of its wells over 10mg/L Nitrate.
Agriculture is a known non-point source of nitrates-nitrogen. Water use of 9.2 million gallons of water use annually threatens aquifer for others. Karst/limestone formations are prevalent in the area and continue to form. Current evaluations do not take that into account. There is absolutely NOT a need to require an EIS.

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Proposed Daley Farms expansion  
Environmental Assessment Worksheet and Individual Feedlot Permit Coverage

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I oppose the Daley Farm expansion and ask the MPCA to require an E.I.S.  
The Daley Farm is not complying to MPCA regulations already put in place. Why will they follow the rules put forward with a bigger expansion with larger environmental consequences, when they haven't complied with old requirements already in place.

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| Name (Required. Please print.) | VAL CORDRY |
| Address (Required. Please print.) | 26000 Co. Rd 9  
| | WINONA MN 55987  

Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194  
(651) 296-6300, toll-free (800) 657-3864, TTY (651) 282-5332 or (800) 657-3864  
This material can be made available in alternative formats for people with disabilities.  
Printed on recycled paper containing at least 30 percent fibers from paper recycled by consumers.
October 17, 2018

Dear Ms. Groenkeite:

As someone who lives in an area of the state with serious water quality issues, I am asking you to require an Environmental Impact Statement on the proposed expansion of the Daley Farm in Lewiston.

By more than doubling their herd of cattle, they will be putting the surrounding area in serious danger of water (not to speak of soil and air) pollution. The good of the larger community must take precedence over the profits of one company. Thank you for your consideration of this concern.

Respectfully,

Mabel Mabel
6460 Larson Acres
Cottage Grove, MN 55016

nicholsmabel@yahoo.com
Comment Sheet
Proposed Daley Farms expansion
Environmental Assessment Worksheet
and Individual Feedlot Permit Coverage

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I am glad that Daley Farms has a successful dairy operation in our area. Due to my concern over water quality & water use, I would ask that Daley Farms not expand beyond their current animal unit level. Our feedlot ordinance is in place to protect the health & wellness of Winona County lands, waters, and citizens.

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TO KIM

MINN POLLUTION CONTROL AGENCY
I WENT TO THE MEETING OCT 14th
REGARDING THE DALEY DAIRY EXPANSION.
I AM VERY CONCERNED ABOUT THIS
PROJECT, AS TO WHAT EFFECT IT WILL HAVE
ON WATER QUALITY, AIR QUALITY AND
SUPPLY. THIS IS THE MAIN CONCERN OF
THIS WHOLE PROJECT AND ALSO THINKING OF
THE FUTURE, NOT JUST TOMORROW.

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<td>Address (Required. Please print.)</td>
<td>28651 CR Rd 33</td>
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<td>UTICA, MINN (City, State, Zip) 55979</td>
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To Kim

Minn Pollution Control Agency

Comment Sheet For Daley Farms

Daley's own a farm South of where we live on County Rd 33 and when they haul chopped alfalfa in early June and corn silage in the fall it is a steady roar of trucks going by every 3-4 mins and they are moving that is now with 1700+ cows. What will it be with the increase?

You have to think of safety getting out on the road. They go from early morning till way late at night sometimes.

I saw the slogan "We Support All Dairy" I think we are destroying dairy by there big massive set ups.

Highway 14 is to be one of the seinc routes through S.E. Minn but coming past Daleys now you can smell liquid manure at certain times, with more cows the smell will last longer. What do city people think of this that have never been on a farm and this is
WHERE SOME OF THEIR FOOD COMES FROM. THINK ABOUT IT.
AN EIS SHOULD BE DONE.
I WONDER IF EVERYONE INVOLVED WITH THIS EXPANSION REALIZES THE MAGNITUDE OF THIS PROJECT, THE AMOUNT OF QUESTIONS FROM LOCAL, STATE, AND WORLD WIDE, MANY FOREIGN VISITORS AND NO EIS? THEY WILL SAY TO YOU HOW DID YOU GET BY THAT?

THANK YOU
JOE SPELTZ
2865-1 C-4233
UTICA, MINN 55979
Comment Sheet
Proposed Daley Farms expansion
Environmental Assessment Worksheet
and Individual Feedlot Permit Coverage

Your comments!

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Kim Grosenide, MPCA, 520 Lafayette Road N., St. Paul, MN 55155. You may also submit comments online:

The over riding issue regarding the proposed expansion is the probable effect on the aquifer, and therefore local wells.
According to Minnesota Dept. of Agriculture results for 2018 tests for nitrate nitrogen, 42.4% of wells tested over the 10 mg/L limit in Fremont twp., 19.6% in Utica twp., and 14.5% in St. Charles twp., and 11.3% in Warren twp. The Daley farm is in Utica twp. They are proposing to increase their dairy herd by 16.7%, from 1928 cows and calves to 4,628. Where is all the increase in manure going to go? Are they already near their application limits? If they are allowed to proceed, and in a few years

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<td>Winona, Mn. (Street)</td>
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<td>55987 (City, State, Zip)</td>
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The groundwater contamination is worse, then what can be done? We need an Environmental Impact Statement!

This farm already exceeds the limit for animal units set by Winona County, since they were grandfathered in. So I'm wondering how they expect to get approved by Winona County. Are they relying on being able to get the limits changed?
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

I'm from a family-owned livestock farm. I understand the unique challenges of small, family-run farming, particularly the challenges of competing with larger and/or corporate livestock production. I'm also from the incredibly valuable landscape, geology, Mississippi River Valley, bluff country, and driftless region that is southeast Minnesota. I still live here and I don't want to see this one-of-a-kind place deteriorate further.

The EAW indicates that this factory farm expansion will generate 46 million gallons of liquid manure annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order the completion of an Environmental Impact Statement (EIS).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

I understand that Midwest dairies are struggling and that expansions make financial sense. I understand the efficient nature of confined animal farming operations, otherwise known as CAFOs-- a high animal density on a small amount of land allows more livestock for shorter periods of time while providing more space for row crops. I get this, that doesn't mean I agree with this form of farming or that I don't empathize with Daley farms and family members about the future of their farming endeavors. I'm not opposing the survival of the Daley dairy, I'm speaking in opposition to the environmental impact this expansion would have.

I spent a large amount of my senior theses at Grinnell College conducting microbial research regarding the antibiotic resistant genes and bacteria that pose threats to human and environmental health in a myriad of ways. Antibiotic resistance, whether naturally occurring or created via overuse of antibiotics, is one of the most prominent threats to our health and future as a species. Overuse and over-reliance on antibiotics positively benefits CAFO farms-- in the short term-- animals in high-density environments get sick less often and yield higher weight gains or milk production. In the long term, animals cannot metabolize the amount of antibiotics they're exposed to (whether through injections, feed, water sources, etc) and excrete the un-metabolized antibiotics, which are then stored in manure lagoons or run off to lower elevations with rain water, wind, and snow melt (in applicable areas). While stored in manure pits, antibiotic resistant genes and bacteria can change-- genetically and metabolically.

Resistance genes and bacteria can transfer from a resistance organism to a non-resistant organism, through horizontal gene transfer, HGT, which transforms non-resistant bacteria and/or genes to resistance bacteria/genes and also poses a threat to further spread-- through future bacterial replication cycles by the genetic spread of antibiotic resistance through HGT. When manure is spread or spilled, such resistance can be spread. In instances where resistance is not spread, the microbiota of the landscape that is now exposed to manure as fertilizer is drastically affected. I've spent countless hours in a lab counting the number of antibiotic resistance colonies prior to and after manure application in Iowa-- resistance does spread. This is a well-documented fact of which the consequences are not yet well known. We do know the consequences are overwhelmingly concerning and threatening to the balances
of naturally occurring antibiotic resistance and the consequence of tipping these balances.

Once spread as fertilizer, manure that is not fully absorbed often erodes with precipitation events, wind, and/or snow (where applicable). If antibiotic resistance components are present, these are now transferred to waterways, where naturally occurring resistance is much LESS common than in terrestrial soil spaces. Regardless of if resistance is present or not, the amount of concentrated nitrogen, phosphorous, and urea that comprise manure (and give it its nutrient-rich properties as fertilizer) that are introduced to waterways through manure runoff are more than naturally occurs near and in waterways and almost always contribute to algal blooms downriver. At their most basic, algal blooms threaten the organic life of water systems by decreasing oxygen availability (i.e. causing fish kills) and causing algal mats at surface levels, which inhibit the photosynthesizing ability of many below-surface plants. The consequences of high-density manure lagoons and over-reliance on antibiotics and their subsequent potential (but likely and documented) affects for nearby water, air, and plant systems need to be taken seriously if local agriculture as a whole entity is to thrive in the future. We cannot push our polluted problems onto others downstream, downwind, or hidden from us.

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211). Again, please reference my above comments. The consequences of high-density manure lagoons and over-reliance on antibiotics and their subsequent potential (but likely and documented) affects for nearby water, air, and plant systems need to be taken seriously if local agriculture as a whole entity is to thrive in the future. We cannot push our polluted problems onto others downstream, downwind, or hidden from us.

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html). My family and I survived the 2007 floods of Rushford, Lanesboro, Lewiston, Wiscoy Valley, parts of Winona, etc. We were lucky. Lagoon pits will never be able to contest with such a force of nature as the 2007 floods, which are expected to increase with increasing climate change intensity.

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that. I want all family farms to succeed-- I know the struggle and the sentimental, often trans-generational pride of family-farming. But there is a balance to sustaining a competitive, productive, and rural farming economy. Big, corporate-consolidated dairies are not the answer for Winona, Fillmore, and surrounding counties. Southeast MN has a unique responsibility to protecting the precious geological, hydrological, and
topographical beauties that make our home so special-- industrial-scale dairy farms and row crops cannot preserve this unique landscape, especially not with expansions. The health threats posed by increased manure and increased manure spreading need to also be considered- such as the aerosolization of antibiotic resistant genes and bacteria (recent data have found increased densities of MRSA bacteria near high-density farms), that neighboring families, farms, and communities cannot escape. We need to consider potential increases in health-related expenses due to illness and environmental degradation and the affect this might have for our local communities.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County's ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Ultimately, I support family-owned business and understand that the dairy industry is struggling. However, expansions need to account for the threats to environmental and human health, our unique SE Minnesota landscape, and the local economy of many small, family-owned dairies that may be outcompeted by a Daley farm expansion. Our landscape cannot tolerate 46+ million gallons of manure annually. If our landscape cannot tolerate it, surely those downstream, who are exposed to higher concentrations of pollution runoff from many directions, will not be able to either.

I'd be happy to share the research I cited above, if requested.

Sincerely,

Haley O'Neill
29182 Hartwood Dr.
Rushford, MN 55971
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Sincerely,

Joan Buske
2718 25th Ave SE
Rochester, MN 55904
Kim and Mark,

Below are my public comments, and supporting documentation with regard to the Daley Farm expansion. I did submit them via the website, as well. I just wanted to make certain they went through.

One topic I neglected to address on the website was the agencies’ use of air quality “models”, and “agronomic rates” of manure application. When were these models and rates developed? Have they been updated to account for the changing climate in Minnesota (i.e., more frequent severe weather events, etc.)? It does not seem sufficient to rely on theoretical models and rates to preserve air and water quality, especially when other factors have changed dramatically. When conditions on the ground are significantly different than when the models and rates were developed, actual testing is required to determine whether they are still valid.

This is yet another reason it is essential to our public health and welfare that a full EIS be performed.

Sincerely,

Kelley Stanage
Winona County resident

Public Comments Regarding Daley Farms of Lewiston, LLP - 2018 Dairy Expansion

First and foremost, I seriously question the propriety of the MPCA spending taxpayer money to conduct an EAW for a project that is without question a prohibited land use in Winona County. This project exceeds the animal unit cap for the county, and is thus prohibited.

MPCA staffer, Kim Grosenheider informed me that the MPCA was aware of this, and they were told by the applicant that they would need to get a variance in order to proceed.

It would seem the appropriate action on the part of the MPCA would have been to decline to perform the mandatory EAW until such time as the applicant actually received a variance, thereby avoiding spending taxpayer money for their staff (and the numerous other expert staff in other agencies) over a year to complete the EAW. At this point, this project is still not a legal land use in Winona County.

Aside from this particularly thorny issue, there are a number of reasons an EIS should be required for this project.

As stated earlier, there is an animal unit cap on feedlots in Winona County. One of the primary reasons for this is water quality in our Karst geology. Because of poor water quality (nitrates), local governments have had to drill new wells and implement mitigation methods to provide water to cities that will meet minimum quality standards.

Private wells, from which most rural residents get their drinking water, also suffer from nitrate levels which do not
Meet minimum healthy standards.

MPCA staff and industry frequently refer to “best practices” when talking about preserving water quality. These “best practices” typically do not take into account the fact that our changing climate has made severe weather events far more frequent — it doesn’t matter how thick manure pond linings are if the manure pond overflows due to heavy rain and/or flooding. This poses a very real threat to groundwater quality, something that an EIS should examine.

In addition, has any analysis been done regarding the locations on which the manure is to be spread? Are they receiving manure from other sources? Have nitrate levels been actually monitored in any of these locations with devices such as lysimeters?

How will it be determined whether the crops are absorbing the nutrients, or if they are going into groundwater, making an already severe water quality problem even worse? And, even if it were ever proven that the manure application was contributing to the nitrate problem, what party is responsible for cleanup? The dairy? The landowner on which the manure was applied? The MPCA? It if it is the MPCA, then it ends up being the taxpayer.

In addition to contaminants such as nitrates, other types of potential contaminations should be examined, such as phosphorus, antibiotics, and hormones.

Another particularly troubling factor is the DNR’s statement in the EAW, “The DNR has stated in the preliminary approval letter, that DNR has “determined that the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands.” This alone should be sufficient to do a full EIS, and the report points out, “State law establishes domestic use as the highest priority. . .”.

Why should a resident with a private well be forced to go through a “standardized procedure of investigation,” doubtlessly a long, involved, bureaucratic, perhaps expensive process which may or may not end up proving their well dried up because their neighbor needed a high-capacity well to expand their dairy well beyond what is legally permitted in the county? Which party will have the financial resources to prove their position? The owners of an enormous dairy, or the neighbor?

Lastly, the EAW did not examine the effects of this expansion on the economics of the area. This particular business has already demonstrated a propensity to ignore labor laws. For more information on this, please reference the Winona Post article from 2/24/13, titled, “Federal agency rules in favor of farm workers in labor dispute,” outlining Daley Farm violations for which the farm was ordered to pay $86,385 in unpaid wages and damages.

Aside from the poor employment conditions the above referenced article indicates, such factory farms typically do little to benefit the local economy. Smaller family farms typically do business locally with regard to feed and equipment, while larger mega-dairies do business outside the area, and generate few quality jobs for local residents. Also, the sheer scale of this dairy threatens to put smaller operators out of business in this tight dairy market. I am sure there are other key economic effects that should be thoroughly examined through an EIS.

It should be obvious that a full Environmental Impact Statement be required on this project for numerous reasons. The key reasons in my mind are the following:

This project is prohibited by the Winona County Zoning Ordinance.

The enormous volume of manure puts already impaired water at risk - both public and private wells.

The proposed volume of water to be used (which is nearly equivalent to adding three new towns the size of Lewiston) “may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands.”

The economic risks posed by this project have not been examined.

The outcome of an EIS will make clear why Winona County has prohibited a land use such as this in the first place.

Sincerely,
Kelley Stanage
Winona County resident
Federal agency rules in favor of farm workers in labor dispute

(2/24/2013)

by Chris Rogers

A Lewiston dairy farm has been ordered to pay $86,385 in unpaid wages and damages following an appellate court ruling stating that the farm violated state labor laws. Daley Farms refused to pay 46 employees over $43,000 in overtime wages. Another area farm, Hader Farms, of Zumbrota, agreed to $17,633 in back wages in a recent settlement with the Minnesota Department of Labor and Industry (DLI).

The July 2012 court ruling ended a six-year legal battle between Daley Farms and the DLI. The appellate court's decision clarifies and perhaps changes how Minnesota labor laws apply on the farm.

Daley Farms is a well-respected name in local agriculture. It hosted the Winona Chamber of Commerce Night on the Farm in 2009 and in June 2012—a month before the appellate court decision. Land Stewardship Project spokeswoman Barb Nelson said the folks at the Daley Farm are good people. "Everybody looks up to them," she said.

But in 2006, Daley Farms received an order of compliance from the DLI, telling it that it had to pay its workers overtime. Presumably, employee complaints alerted the DLI to the situation. Daley Farms appealed the order.

At the heart of the farm's objection was whether its workers met an exception to the state overtime requirement. Under the Minnesota Fair Labor Standards Act (MFLSA) farm workers must be paid time-and-a-half after 48 hours of work in a week, unless they earn a weekly salary greater than the wages for 48 hours at minimum wage plus 17 hours of overtime. According to the appellate court decision, Daley Farms argued that its workers did earn more than that and thus fit the exception. The DLI maintained the exception did not apply because the workers were paid by the hour, not through a salary agreement.

Daley Farms challenged the DLI orders through various channels over the next five plus years. At one point it seemed like the farm might prevail.

In 2008, an Administrative Law Judge recommended the DLI stand down, because of a 2006 case in which state courts ruled the exception did apply to an hourly laborer whose earnings exceeded the salary threshold.

However, the DLI was unwavering. It dismissed the recommendation and issued a final order to Daley Farms to pay back wages plus damages.
Daley Farms appealed that order with the state appellate court. However, when the court reached its decision last July, it backed the DLI.

In the 2012 decision the court held that the 2006 case did not constitute a legal precedent because the court was "not presented with the question of whether the exemption is limited [by the DLI's regulatory power] to employees paid on a salaried basis." The court also ruled, that although federal labor laws do not require farm workers to be paid overtime, farms must follow Minnesota laws which do.

DLI Commissioner Ken Peterson said there is a misconception among farmers that the federal overtime exemption for agricultural laborers supersedes state law.

"To some extent I think that Daley Farms was trying to test that whole question," Peterson continued. "That is why they litigated it. And I don't blame them for that. They are making sure we are enforcing the law correctly. At the same time, I think we were right from the beginning."

Organizations: labor violations are a big problem in Minnesota agriculture

The Daley Farms case made recent news because of a report issued by the Land Stewardship Project (LSP), Central Campesino, and the Latino Economic Development Center (LEDC)—advocates for sustainable agriculture, Latino and migrant farmworkers, and Latino-owned business, respectively. The report outlines the two cases, which had largely escaped the public eye, and labor law violations the organizations say are a widespread problem in Minnesota, especially among illegal immigrants.

While the DLI said that immigration status is not something that it checks, and therefore could not say if the workers at Daley Farms were illegal immigrants, the content of the LSP, LEDC, and Central Campesino's report and the fact that the DLI brought up the Daley Farms and Hader Farms cases during a discussion of alleged labor abuses against illegal immigrants with the three organizations, raises the question.

In any case, according to the organizations, there are other cases of labor violations against illegal immigrants. The organizations say they have documented cases of "failure to provide a final paycheck after an employee's resignation or dismissal," "failure to pay for all hours worked," "docking of worker wages for damage to farm equipment or buildings," and "failure to inform injured workers of their rights to workers' compensation."

Central Campesino has received reports of abuses like this for years, Executive Director Ernesto Velez Bustos said in the report. "This is wage theft."

Yolanda Cotterall, spokeswoman for the LEDC, said that labor abuse among undocumented workers is a wide spread issue in Minnesota. While her organization is not meant to take reports of labor abuse, the stories keep coming.

LSP spokeswoman Barb Nelson also said that labor law violations against illegal immigrants is a
wide spread problem in Southeastern Minnesota. She has heard several complaints personally, she said. She spoke highly of Daley Farms, and said that if labor violations occurred there, they are "absolutely" occurring elsewhere.

"It's a farmer's responsibility to understand labor laws," she added. "I'm not really compassionate for people who violate them."

Being poor and being an illegal immigrant are both factors which make people vulnerable to labor violations, Cotterall said. And farm workers are disposable, she added. "People are lined up for these jobs in rural communities."

"Undocumented workers hesitate to say anything for fear of deportation," Nelson said.

"Imagine a workforce that has no voice," Cotterall said. "How do you make sure that they are treated justly if they don't speak?"

DLI Commissioner Ken Peterson admitted that the fear of deportation creates a "chilling effect" for would-be reporters of labor law violations, though the DLI protects the anonymity of complainants.

The LSP has asked the University of Minnesota to better promote education for producers on labor laws, to educate workers of their rights (including posting information in workers' native language on the farm), and to research the issue of labor violations and the treatment of immigrant workers.

Farm Bureau: violations are not the norm

"Hispanic labor is an important part of agriculture in Winona County. How many are legally here or not—that is unknown," Winona County Farm Bureau President Glen Groth said. Farmers are not allowed to question workers' immigration status beyond asking for a social security card. "Often times farmers have no way of knowing, until the government sends them back," he said. "That is why some kind of immigration reform is so desperately needed for our industry."

Hispanic labor is important, he said, because farmers cannot find enough local people willing to do the work, even for 10 or 12 dollars an hour wages. Conversely, "A lot of the immigrant labor see it as an opportunity," Groth said. "They are here to work long hours."

Groth said that all of the people he knows pay their workers overtime and offer wages well above minimum wage.

Area farm owners "don't treat these people like dirt," he said. "They treat them like family." Farmers know they cannot operate their farms without good help, and many immigrant workers "move into management positions, and become an integral part of the operation," Groth said.

Nelson concurred that she knew of employers who help their immigrant workers as if they were family. "The saddest part of the whole thing is that the violators give everyone a bad name," she
said. "People will start to think that everyone who hires Hispanic workers are treating them badly."

"Employers are doing what they need to do to. To say that abuse is widespread is an error and not representing the reality of the situation," Groth said.

Groth added that he would like to see Minnesota labor laws match federal laws, and that the Farm Bureau has considered lobbying for the removal of the state overtime requirements for hourly agricultural laborers. "I think it makes a lot of sense," he said. "The nature of agriculture is that it is seasonal and the work week doesn't always stop at 48 hours. A lot of farms are willing to pay their workers more to have good people on hand when they need them."

Winona Chamber of Commerce President Della Schmidt expressed concerns that complying with stricter labor laws may put Minnesota farms at a disadvantage. "When farms on the other side of state lines have more agribusiness-friendly policies, that is concerning for us."

A recent proposal in the state senate would increase minimum wage and overtime requirements for a variety of businesses including agriculture (see story).
Winona County: Final Overview of Nitrate Levels in Private Wells (2016-2017)

The Minnesota Department of Agriculture (MDA) determines current nitrate-nitrogen concentrations in private wells, on a township scale, through the Township Testing Program. The MDA has identified townships throughout the state that are vulnerable to groundwater contamination and have significant row crop production. The MDA plans to offer nitrate testing to more than 70,000 private well owners in over 300 townships by 2019.

Each selected township is offered testing in two steps, the “initial” sampling and the “follow-up” sampling. In the initial sampling, all township homeowners using private wells are sent a nitrate test kit. If nitrate is detected in their initial sample, the homeowner is offered a follow-up nitrate test, pesticide test and well site visit. Trained MDA staff visit willing homeowners to resample the well and then conduct a site assessment. The assessment helps to identify possible non-fertilizer sources of nitrate and to see the condition of the well. A well with construction problems may be more susceptible to contamination.

The MDA and Winona County Environmental Services worked together to select townships and implement the nitrate testing project. The following townships were selected: Elba, Fremont, Hart, Hillsdale, Mt. Vernon, Norton, Pleasant Hill, St. Charles, Saratoga, Utica, Warren, Wilson, and Wiscoy. The initial sampling in Winona County started in 2016 and follow-up sampling ended in 2017.

Results
Two datasets are used to evaluate nitrate. The initial well dataset contains 940* wells; the final dataset contains 731 wells. Wells that had nitrate-nitrogen results over 5 mg/L were removed from the initial dataset if a non-fertilizer source or well problem was identified, to form the final well dataset. A total of 209 wells (22%) were removed. The results from the initial and final well datasets are summarized in the table below.

In Fremont, Saint Charles, Utica, and Warren Townships, more than 10% of the wells were over the Health Risk Limit of 10 mg/L of nitrate-nitrogen (map below). The percent of wells over the Health Risk Limit in each township ranged from 0% to 42.9%. The Winona County Final Report will be available on the MDA website in 2018: www.mda.state.mn.us/townshiptesting.

Next steps
The MDA uses the final well dataset to determine if additional action is warranted, as described in the Minnesota Nitrogen Fertilizer Management Plan (NFMP). The MDA uses the assessment process and prioritization guidelines in the NFMP to determine next steps. Find more information about the NFMP on the MDA website at www.mda.state.mn.us/nfmp.

Funding Acknowledgement
Funding for this project is provided by the Clean Water, Land and Legacy Amendment

Published May 2018
Table: Winona County Private Well Nitrate Results, 2018.

<table>
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<th>Township</th>
<th>Initial Well Dataset</th>
<th>Final Well Dataset</th>
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<tr>
<td></td>
<td>Total Wells</td>
<td>Percent of Wells ≥10 mg/L Nitrate-Nitrogen</td>
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<tr>
<td>Elba</td>
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<td>Hart</td>
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<td>Utica</td>
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<td>Warren</td>
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</tr>
<tr>
<td>Total</td>
<td>940</td>
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</tr>
</tbody>
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* All well types included.

Figure: Winona County Final Well Dataset Map, 2018.

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-291-6060. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.
Dear Ms. Kim Grosenheider:

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This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS.

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation.

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact.
on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County's ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

Shahin Shabanian
1111 Elmira St
Williamsport, PA 17701
Our natural resources are too precious and the magnitude of this proposal is too great to rush this process.

Brennan Malanaphy

920 N Everett Street
Stillwater, MN 55082

612-308-1676

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**Demand Full Environmental Review for Mega-Dairy Operation Proposed in Winona County**

*Proposal Would use 92 Million Gallons of Groundwater & Produce 46 Million Gallons of Manure in the Sensitive Karst Region*

Corporate interests are suing to shorten the comment period: [Comments may be needed to the MPCA as soon as Oct. 31, 2018, at 4:30 p.m.](#)

Rural people know that factory farms harm the environment and viability of rural communities. Now Daley Farms of Lewiston, LLP in Winona County wants to increase its current operation by almost 3,000 cattle for a total herd size of 4,628. This would make Daley Farms one of the largest dairy operations in the state. Over 96 percent of dairy farms in Minnesota are 500 cows or fewer.

This proposed expansion would double the liquid manure and waste water production of this operation to 46 million gallons a year, and require adding a manure basin the size of three football fields at a depth of 16 feet. All this liquid waste would sit right over sensitive karst geology, which is composed of porous limestone that is highly prone to sinkholes and disappearing springs. This geology can allow surface pollution to enter the groundwater in a matter of hours.

This dairy expansion would use 92 million gallons of the area’s groundwater annually. The nearby city of Lewiston (pop. 1,506) uses 33.6 million gallons a year. And the operation is surrounded by towns plagued with nitrate levels nearing or above the maximum allowable
nitrate level of 10 mg/L.

**Clearly, this factory farm has the “potential for significant environmental impacts” and needs an Environmental Impact Statement.** Currently, the proposal is undergoing an Environmental Assessment Worksheet (EAW), which is the first step in environmental review. ([The EAW is available here.](#)) The purpose of the EAW is to determine if an in-depth Environmental Impact Statement (EIS) is needed. State law requires that if a project has “the potential for significant environmental impacts,” then an EIS must be completed. An EIS fully considers potential environmental, human and economic impacts, and analyzes how and if the project can be built in a way that mitigates potential harm.

**But corporate interests are suing to shorten the public comment period so it would end on October 31—TOMORROW.** You may remember that the Land Stewardship Project pushed the Minnesota Pollution Control Agency (MPCA) to extend the public comment period to give the public more time to read and understand the hundreds of pages in the environmental review documents. As a result, the MPCA extended the comment period until Nov. 15. Now the state’s largest corporate ag interests, including the Agri-Growth Council, are suing the MPCA to roll back this brief extension so that the comment period will end on Oct. 31 at 4:30 p.m. (We are fighting this and will let you know the outcome.)

**Don’t let corporate ag take away your voice. Submit your comments now demanding an Environmental Impact Statement on the Daley Farms mega-dairy.**

[ACT NOW](#) and submit your comments to the MPCA's Kim Grosenheider at [kim.grosenheider@state.mn.us](mailto:kim.grosenheider@state.mn.us) by 4:30 p.m. on October 31. Tell the MPCA we need an Environmental Impact Statement on Daley Farms LLP’s dairy expansion proposal.

**If you’ve already commented, thanks! If you’ve commented but you've got something to add, it is OK to comment twice.**

For more information, contact LSP organizer Barb Sogn-Frank at 612-722-6377 or [via e-mail](mailto:).
Hi,

I am a farmer in McLeod County and find it very suspect to see a dairy propose to expand to this magnitude when many dairy near us have liquidated and closed down after milking at a loss for so many years in a row. Farming is a optimistic guess each year anyway and farming some years at a loss is part of farming. Knowing milk prices are down below most sustainable rates it does bring a suspecting question of how will such an operation make a go of it without cutting corners in safety, quality, or animal welfare that are not being mentioned up front. It would be a disaster if this farm built the infrastructure to support the cow herd to only close down shortly after starting. No one wins. The goal is or should be that all parties, the individual farmer, community, environment, the other farmers supplying the state, and that the market can support such growth. This letter is being sent to ask you to take a good look at the proposal and not rush any decisions until all parties can win through the decision.

Dan and Donna
The Farm of Minnesota
Dan@thefarmofmn.com
(320) 296-9585
Nutritional Supplements:
   https://www.amway.com/moe
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I am certainly aware of the restrictions and constraints new business ventures must overcome in order to expand; it is the "sticking point" that differentiates those who grow and those who don't. Likewise, tax- payers and folks who are directly impacted by those business decisions must protect their assets and their road to success.

To be asked for a full environmental review on this expansion must surely have been anticipated by the decision-makers in this endeavor. It makes good business sense for taxpayers and other folks who are being possibly adversely affected by the expansion make certain their growth, their health, and their assets remain solid and not put at risk.

Sincerely,

Robert Schultz
118 Glendale Rd.
Winona, MN 55987
4,628 cows on a single farm?!!!

I’ve read that the proposed expansion of Daley Farms would produce 46 million gallons of liquid manure and waste water a year, and it would sit atop sensitive karst geology – limestone that is porous and could allow the surface pollution to enter the groundwater easily. The expansion would also use 92 million gallons of the area’s groundwater annually, when the entire nearby city of Lewiston uses only 33.6 million gallons a year! Clearly, an EIS is desperately needed to honestly gauge the potential for significant environmental, human and economic impacts. It’s time to use science instead of looking only at profit margins.

Kim Hiltner, Paynesville MN
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I grew up on a farm in this area and had the benefit of being able to enjoy pure spring water straight out of the ground without worrying about nitrate levels. This dairy expansion is a bad idea all around. Please take the time to explore the facts before approving.

Sincerely,

Marie Malanaphy-Sorg
165 Western Avenue N. #205
St. Paul, MN 55102
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

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This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

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Sincerely,

Dean Borgeson
36030 Bonnie Lakes Rd
Crosslake, MN 56442
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Sincerely,

Michelle Wilkes
383 South Ridge Rd
Houston, MN 55943
Dear Ms. Kim Grosenheider:

As a trained geologist, and lifelong resident in southeastern Minnesota, I am appalled at the consideration of the Daley Farms of Lewiston, LLP dairy operation expansion proposal near Lewiston, in Winona County, in our sensitive karst environment, for the reasons listed below and am adding my voice to the requests for an Environmental Impact Statement.

This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows ([https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php](https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php)).

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Marilyn Frauenkron Bayer
15910 Catalpa Coulee Drive
Houston, MN 55943
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marco polo
1105 scanlon way
cloquet, MN 55720
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Sincerely,

Dayna Burtness
23970 county 19
Spring grove, MN 55974
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Sincerely,

Thomas Walsh
N4693 440th Street
Menomonie, WI 54751
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Sincerely,

Laura Dillon
3245 39TH AVE S
MINNEAPOLIS, MN 55406
Dear Ms. Kim Grosenheider:

Dear Kim and environmental board,

I don't blame Daley's for trying to make a living. Our government is designed to make a few rich from the work of farmers and labor. At the beginning of this nation, those producers were called serfs and slaves. Now we are called farmers and labor.

Say NO to that expansion. All of us own that water they expect to use. All of own the air they will pollute- to the detriment of our health and our ecosystem.

I don't want more nitrogen in my water from my private well.

We are told that milk prices at the farm are so low because there is a surplus surplus of milk. If Daleys increase the surplus some more, the milk prices will go down some more and hurt all the dairy farmers and that will hurt the economy some more because dairy farmers will not be able to meet as many of their needs as those who sell those needs need us to, so they can make a living.

Please do what you can to make this into a just-for-everyone nation. Farmers are still serfs, we just aren't called serfs any more.

I hope you read my letter to the editor.
I have to leave for Aberdeen now. My brother died

Lorraine Redig

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

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Sincerely, Mrs Lorraine Redig

Sincerely,

Lorraine Redig
27689 Gilmore Ridge Drive
Winona, MN 55987
I live in the same county as the Daly Farm and use the water from the area. I feel strongly that an EIS is warranted for this expansion. Water in the area is already very high in nitrates. More animal waste being spread is only moving in the opposite direction as a fix. Tremendous risk associated with the liquid manure storage. Over 90 million gallons of our water being used for this one enterprise. Unfair to the rest of us. Much greater usage than any of the adjacent towns. We need to reduce the nitrate levels for the safety of our citizenry and our children. Thank you.

Vincent Ready
Saratoga township MN
vincentready@hotmail.com

Get Outlook for Android
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Sincerely,

Robert Goetz
900 17th Ave SW
Austin, MN 55912-2881
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Sincerely,

Mary Baird
9601 Union Road PO Box 1
Donaldson, IN 46513
The Daley Mega Dairy will not treat dairy cows with respect because there are too many cows.

It will damage the environment with 46 million gallons of manure and the amount of water it will use is unacceptable.

Do what’s right and do a full environmental review of the Daley Farms proposal.

Barbara Veit
24558 Osprey Ln
Bovey, MN
55709

bdveit@paulbunyan.net

218-910-9313
Kim Grosenheider,

Please extend the public comment period so that it does not end on October 31st. I believe we must limit the environmental impact of huge diary operations. The wastewater and liquid manure are toxic as they weep into the ground, they contaminate the water sources and are a public health nuisance. Also when there are thousands of cows together in confined area, the bacteria spreads like wildfire and farmers must use antibiotics to keep both cows and milk safe.

Phoebe Ruona
900W 48th St.
Minneapolis
Dear Kim,

Please use your power and expertise to conduct an environmental review for the mega-dairy operation proposed by the Daley Farms in Winona County. The use of groundwater and the resulting millions of gallons of manure each year puts the Karst Region watershed in peril.

Rural people know that factory farms harm the environment and viability of rural communities. Now Daley Farms of Lewiston, LLP in Winona County wants to increase its current operation by almost 3,000 cattle for a total herd size of 4,628. This would make Daley Farms one of the largest dairy operations in the state. Over 96 percent of dairy farms in Minnesota are 500 cows or fewer.

Thank you.

Chris Hughes
3515 Snelling Ave N
Arden Hills, MN 55112

cthchahch@comcast.net
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Sincerely,

Kurt Kimber
4811 35th Ave S
Minneapolis, MN 55417
October 30, 2018

To Whom It May Concern:

I understand that Daley Farms have applied to enlarge their dairy operation near Lewiston. It is hard to understand why they should be allowed to proceed with such a project, since their herd already exceeds the limit. (I understand they were grandfathered in when the standard was set.) The amount of water the operation would use and the amount of manure it will generate are both big concerns in southeastern Minnesota with its karst geology.

For those two reasons, I am opposed to the project. For sure, it should not go forward without a full, complete, thorough, and fair environmental assessment.

Thank you for allowing this public comment.

Roslyn Hjermstad
30830 Woodhaven Trail
Cannon Falls MN 55009

651-258-4526
roslynhjermstad@yahoo.com
From: Sonja Eayrs <sonja.eayrs@gmail.com>
Sent: Tuesday, October 30, 2018 7:32 PM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>; Sonja Eayrs <sonja.eayrs@gmail.com>
Subject: Environmental Review - Daley Farms

To MPCA Officials:

I encourage you to read the attached briefs that were filed on behalf of my parents, Lowell and Evelyn Trom, to the Minnesota Court of Appeals following installation of the 11th swine factory farm within a 3-mile radius of our family farm in Dodge County, Minnesota.

Amicus ("friends of the court") briefs were filed by the following organizations:

Professionals at Johns Hopkins Center for a Livable Future regarding the public health concerns relating to factory farms;

The Humane Society of the United States and Animal Legal Defense Fund regarding antibiotic resistance and the over-administration of antibiotics to animals held in confinement;

Food & Water Watch, Minnesota Center for Environmental Advocacy and Environment Minnesota regarding the serious environmental concerns relating to factory farms.

While these briefs relate to swine factory farms in Dodge County, the issues are the same and certainly raise serious concerns regarding the expansion of Daley Farms of Lewiston, LLP in Winona County or other Minnesota counties.

Please include the attached briefs in the official record.

Please, we need environmental review of this mega-dairy operation to protect Minnesota waterways and neighboring farm families.

Sonja Trom Eayrs
612 743 1312
Sonja.eayrs@gmail.com
On behalf of Dodge County Concerned Citizens

4 Attachments

NOTICE: This email (including attachments) is covered by the Electronic Communications Privacy Act, 18 U.S.C. 2510-2521. This email may be confidential and may be legally privileged. If you are not the intended recipient, you are hereby notified that any retention, dissemination, distribution, or copying of this communication is strictly prohibited. Please reply back to the sender that you have received this message in error, then delete it. Thank you.
Amanda/Peter,

Thanks again for your time this afternoon. Just wanted you to know that I heard from Socially Responsible Agricultural Project (SRAP) this afternoon. Jim and I are going to participate in a conference call with SRAP sometime this week, and it’s possible that they will also submit an amicus brief.
State of Minnesota
In Court of Appeals

Lowel Trom, et al,

Appellants,

vs.

County of Dodge, et al,

Respondents,

And

Masching Swine Farms, LLC

Respondent.

BRIEF OF AMICI CURIAE DR. JILLIAN P. FRY, Ph.D., M.P.H.,
DR. ROBERT S. LAWRENCE, M.D., MS. CLAIRE M. FITCH, M.S.P.H.,
AND MS. CAROLYN R. HRICKO, M.P.H.

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Lowell Trom, et al.

PAUL D. REUVERS (#0217700)
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Bloomington, MN 55438
(952) 548-7205
Attorney for Respondents
Dodge County, et al.
State of Minnesota

In Court of Appeals

Lowell Trom, et al., Appellants,

v.

County of Dodge, et al., Respondents, and
Masching Swine Farms, LLC, Respondent.

BRIEF OF AMICI CURIAE
THE HUMANE SOCIETY OF THE UNITED STATES
AND ANIMAL LEGAL DEFENSE FUND

JAMES P. PETERS (#177623)
Law Offices of James Peters PLLC
460 Franklin Street N. #100
Glenwood, MN 56334
(320) 634-3778
Attorney for Appellants

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Environmental Organizations

BRUCE D. NESTOR (#318024)
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3547 Cedar Avenue S.
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(612) 659-9019
Attorney for Amici The Humane Society of the United States and Animal Legal Defense Fund
TABLE OF CONTENTS

TABLE OF AUTHORITIES........................................................................................................... ii

ARGUMENT................................................................................................................................. 1

I. INTRODUCTION ....................................................................................................................... 1

II. THE PLANNING COMMISSION, DODGE COUNTY BOARD, AND TRIAL COURT ALL ERRED IN IGNORING ANTIBIOTIC RESISTANCE IN BACTERIA AS A RISK TO THE PUBLIC HEALTH........................................................................................................... 3

a. The County and the District Court Failed to Consider Appellants’ Significant Health Concerns of Increased Antibiotic Resistance from the Masching Feedlot Approval. .......... 3

b. The Dodge County Zoning Ordinance Requires Consideration of Antibiotic Resistance and Its Public Health Implications........................................................................... 6

c. The Addition of a Large Hog Feedlot Significantly Increases the Risk of Proliferation of Antibiotic-Resistant Bacteria......................................................... 8

d. The County Decision to Approve the Masching Feedlot Conditional Use Permit without Any Consideration to the Risk of Increased Antibiotic Resistance Was Arbitrary and Capricious .......................................................... 19

III. THE DISTRICT COURT’S STANDARD OF REVIEW WAS FAR TOO DEFERENTIAL TO COUNTY DECISION-MAKERS ................................................. 20

IV. CONCLUSION............................................................................................................................. 25

CERTIFICATE OF BRIEF LENGTH ............................................................................................. 26
# TABLE OF AUTHORITIES

## Cases

**BECA of Alexandria, LLP v. County of Douglas ex rel. Bd. of Comm’rs,** 607 N.W.2d 459 (Minn. App. 2000) ................................................................. 7, 19

**Corwine v. Crow Wing County,** 244 N.W.2d 482 (Minn. 1976) .................................................. 20

**In re Block,** 727 N.W.2d 166 (Minn. App. 2007) ............................................................... 22

**In re City of Annandale,** 731 N.W.2d 502 (Minn. 2007) .................................................. 21, 24

**Interstate Power Co. v. Nobles County Bd. of Comm’rs,** 617 N.W.2d 566 (Minn. 2000) ............................................................... 20


**Minn. Ctr. for Envtl. Advocacy v. City of St. Paul Park,** 711 N.W.2d 526 (Minn. App. 2006) ............................................................... 22

**Minn. Ctr. for Envtl. Advocacy v. MPCA,** 644 N.W.2d 457 (Minn. 2002) .................................................. 21

**Minn. Transitions Charter Sch. v. Minn. Dep’t of Educ.,** 2004 Minn. App. LEXIS 525 (Minn. App. May 11, 2014) ............................................................... 22


**Pope County Mothers v. Minn. Pollution Control Agency,** 594 N.W.2d 233 (Minn. App. 1999) ............................................................... 7, 18, 19

**RDNT, LLC v. City of Bloomington,** 861 N.W.2d 71 (Minn. 2015) .................................................. 22

**Reserve Mining Co. v. Herbst,** 256 N.W.2d 808 (Minn. 1977) .................................................. 21, 22

**Reserve Mining Co. v. MPCA,** 364 N.W.2d 411 (Minn. 1985) .................................................. 23

**Schwardt v. County of Wantonwan,** 656 N.W.2d 383 (Minn. 2003) .................................................. 7, 20, 23

## Statutes

**Minn. Stat. § 394.301** ............................................................... 6, 22, 23

## Other Authorities


European Ctr. for Disease Prevention & Control et al., Joint Opinion on Antimicrobial Resistance Focused on Zoonotic Infections (2009) ........... 9, 10, 15, 16

Eva Hershaw, “When the Dust Settles,” Texas Monthly (Sept. 2016) ................................................................. 15

FDA, 2014 Summary Report on Antimicrobials Sold or Distributed for Use in Food-Producing Animals (Dec. 2015) ................................................................. 17


Gerd Hamscher et al., Antibiotics in Dust Originating from a Pig-Fattening Farm, 111 Envtl. Health Perspectives 1590 (2003) ................................................................. 15

Jessica L. Rinsky et al., Livestock-associated Methicillin and Multidrug resistant Staphylococcus aureus is Present among Industrial, Not Antibiotic-free Livestock Operation Workers in North Carolina, 8 PloS ONE e67641 (2013) ................................................................. 15

Jim O’Neill et al., Tackling Drug-Resistant Infections Globally: Final Report and Recommendations, Review on Antimicrobial Resistance (May 2016) ................................................................. 8

Jim O’Neill et al., Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations, Review on Antimicrobial Resistance (Dec. 2014) ................................................................. 16

John P. Holdren & Eric Lander, President’s Council of Advisors on Sci. & Tech., Report to the President on Combating Antibiotic Resistance (2014) ................................................................. 8, 14, 17


M. Carrell et al., *Residential Proximity to Large Numbers of Swine in Feeding Operations is Associated with Increased Risk of Methicillin-Resistant Staphylococcus Aureus Colonization at Time of Hospital Admission in Rural Iowa Veterans*, 35 Infection Control & Hosp. Control Epidemiology 190 (2014) ........................................................................................................ 12, 18


M.H. Rostagno et al., *Split Marketing as a Risk Factor for Salmonella Enterica Infection in Swine*, 6 Foodborne Pathogens & Disease 865 (2009) .................................................. 11


Press Release, United Nations, High-Level Meeting on Antimicrobial Resistance (Sept. 21, 2016) ........................................................................................................................................ 3

Science Daily, “Multidrug-Resistant Bacteria Found to be Airborne in Concentrated Swine Operation” .................................................. 14

Shylo E. Wardyn et al., *Swine Farming is a Risk Factor for Infection With and High Prevalence of Carriage of Multidrug-Resistant Staphylococcus Aureus*, 61 Clinical Infectious Diseases 59 (2016) ............................... 10


U.S. Gov’t Accounting Office, No. GAO-11-801, Agencies Have Made Limited Progress Addressing Antibiotic Use in Animals (2011) ....................... 17


**Regulations**

Dodge County Zoning Ordinance § 18.13.12 ............................................. 25

Dodge County Zoning Ordinance § 18.13.8 ............................................. 6, 7, 19

Exec. Order No. 13676 (Sept. 18, 2014) .................................................. 16

ARGUMENT

Pursuant to this Court’s August 19, 2016 Order, as well as Rules 129 and 132 of the Minnesota Rules of Civil Appellate Procedure, amici The Humane Society of the United States (“HSUS”) and Animal Legal Defense Fund (“ALDF”) submit the following brief in support of Appellants.¹

I. INTRODUCTION.

In their challenge to the approval of Masching, LLC hog feedlot conditional use permit (“CUP”), Appellants Lowell and Evelyn Trom did not receive the agency and judicial review they deserved. The Dodge County Planning Commission and Board of Commissioners (collectively, “the County”), and subsequently the Dodge County District Court, approved the Masching CUP without full inquiry into the hog feedlot’s public health threat, opening the door for disease and infection to enter easily into the Appellants’ community. In support of Appellants, HSUS and ALDF respectfully submit this amicus brief to assist the Court in understanding two critical errors that occurred within the CUP approval and judicial review decisions below.

First, the County and the District Court both failed to consider a serious threat to public health and animal welfare: the spread of antibiotic-resistant bacteria. Appellants repeatedly explained to the County how the hog feedlot CUP risked developing and widely spreading antibiotic-resistant bacteria in the area, posing a specific public health threat to feedlot workers, neighbors, and County residents. The Masching feedlot will

¹ No party’s counsel authored this brief in whole or in part, and no person or entity other than amici and their counsel contributed to the preparation and submission of this brief.
produce manure that will first pile up inside the feedlot building, and will then be spread over at least 244 acres. Antibiotic-resistant bacteria from the manure can jump to human populations via various environmental pathways—through the air as dust, up from the soil into edible crops, and into groundwater and surface waterways. Yet the County did not press pause on its fast-track approval of the Masching CUP—i.e., what the District Court called a “cart-ahead-of-the-horse approach to CUP analysis and approval”—to assess the potential health risks. Nor did the District Court acknowledge the serious threat of increased antibiotic resistance. In spite of broad scientific consensus that the continuous, herd-wide use of antibiotics to raise pigs has led to the development and spread of antibiotic-resistant bacteria,² both the County and the District Court erred by failing to considered whether and how the Masching CUP would contribute to the presence of antibiotic-resistant bacteria in the area.

Second, the District Court gave far too much deference to the County in its decision to approve the Masching CUP. The County gave no indication that it had even considered the spread of antibiotic resistance in its CUP decision. But because the County approved the Masching CUP application, the District Court assumed that the County must have implicitly considered the antibiotic resistance public health threat. The District Court then deferred to the County decision. This conflicts with longstanding principles of administrative law, which do not permit the District Court to engage in blind deference to

² Producers at hog feedlots routinely provide low level doses of antibiotics to every animal in the facility, regardless of whether a specific animal is sick. See Björn Bengston & Christina Greko, Antibiotic Resistance – Consequences for Animal Health, Welfare, and Food Production, 119 Upsala J. Med. Scis. 96 (2014).
the County—especially on this important public health issue. The District Court erred in upholding the CUP decision despite there being nothing in the record to permit meaningful judicial review of the County’s consideration of the consequences of large-scale antibiotic usage at the Masching facility.

Antibiotic-resistant bacteria are so significant a threat that the United Nations General Assembly, acting for fourth time ever on a public health issue and the first time since the Ebola emergency of 2014, declared resistance a “most urgent global risk.” If a county were to fail to consider public health implications in approving a CUP that increased the risk of Ebola, a reviewing court would surely intervene—yet here, the District Court allowed the County to ignore a similar risk.

Accordingly, for the reasons described below, amici HSUS and ALDF support Appellants’ position that this Court should reverse the District Court and vacate the Masching CUP.

II. THE PLANNING COMMISSION, DODGE COUNTY BOARD, AND TRIAL COURT ALL ERRED IN IGNORING ANTIBIOTIC RESISTANCE IN BACTERIA AS A RISK TO THE PUBLIC HEALTH.

a. The County and the District Court Failed to Consider Appellants’ Significant Health Concerns of Increased Antibiotic Resistance from the Masching Feedlot Approval.

Before the County, the Appellants repeatedly expressed concern about how the Masching CUP posed a risk of increased antibiotic resistance. When the County first

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considered the Masching CUP application, in April 2014, Appellants’ counsel James Peters submitted a letter explaining:

MRSA [bacterium named methicillin-resistant Staphylococcus aureus] is considered a major threat to public health with the FDA taking action against hog production facilities to reduce this threat. Among other things, the FDA announced in December 2013 that it is implementing a voluntary plan with the industry to phase out the use of antibiotics for enhanced food production. Antibiotics used in hog feed is a factor in the development of drug-resistant bacteria. Industrial farm workers have been contaminated with pig MRSA, an antibiotic resistant bacteria, that is increasingly found in hogs. The Project would in Dodge County add to what governments consider a major public health threat.

AR 065 (emphasis added). The Peters letter included an exhibit listing multiple studies that explain how CAFOs generally, and hog feedlots in particular, increase the risk of creating and spreading antibiotic-resistant bacteria. AR 069-70. Soon after receiving the Peters letter, the County approved the CUP without considering the feedlot’s impact on developing antibiotic-resistant bacteria. See AR 70A-77.

Appellants appealed the April 2014 CUP approval, and the District Court vacated the CUP on November 18, 2014. See Mem. Order 5, Trom et al. v. Dodge County, 20-cv-15-17 (3d Judicial Dist. Ct. May 13, 2016) [hereinafter “May 2016 Order”]. Two days later, Masching applied for a new CUP for the same project. AR 122. Appellants again submitted information identifying serious concerns with how concentrated feedlots like the Masching CUP proposal contribute to an increase in antibiotic-resistant bacteria. For instance, Appellants submitted a letter from Michael Williamson asking that the County not approve the Masching CUP because hog feedlots “cause health problems.” AR 629.

The Williamson letter included, as an exhibit, a white paper from the National
Association of Local Boards of Health. The white paper described how feedlots like the Masching CUP feedlot can create public health harms:

The trend of using antibiotics in feed has increased with the greater numbers of animals held in confinement. The more animals that are kept in close quarters, the more likely it is that infection or bacteria can spread among the animals. Seventy percent of all antibiotics and related drugs used in the U.S. each year are given to beef cattle, hogs, and chickens as feed additives. Nearly half of the antibiotics used are nearly identical to ones given to humans.

There is strong evidence that the use of antibiotics in animal feed is contributing to an increase in antibiotic-resistant microbes and causing antibiotics to be less effective for humans. Resistant strains of pathogenic bacteria in animals, which can be transferred to humans [through] the handling or eating of meat, have increased recently. This is a serious threat to human health because fewer options exist to help people overcome disease when infected with antibiotic-resistant pathogens. The antibiotics often are not fully metabolized by animals, and can be present in their manure. If manure pollutes a water supply, antibiotics can also leach into groundwater or surface water.

AR 651 (internal citations omitted).

Even though the County decision-makers claimed they "all had a chance to read" the letters they received, see AR 959, neither the County Planning Commission nor the County Board considered, or even referenced, the threat of increased antibiotic resistance in their reports and meetings. See, e.g., AR 779-84, 785-87, 884-971, 986-1007.

The District Court similarly did not consider the risk of increased antibiotic resistance. Appellants directed the District Court to their submissions before the County, 4

4 See also AR 961 ("Okay, we got this big binder here that was handed to us yesterday and that we all read last night") (transcript of Dec. 11, 2014 Dodge County Planning Commission meeting); AR 994 ("We also received the letters that was [sic] talked about earlier so we’ll – we’ll put that into the – packet") (transcript of Dec. 11, 2014 Dodge County Board of Commissioners meeting).
which discussed their suite of public health concerns, including the increased
development of antibiotic resistance. See Pls.’ Mot. for Summ. J. Br. 11-12, 18-19. In its
decision, the District Court only reviewed the County’s consideration (or lack thereof) of
one public health issue—the “alleged connection” of feedlots to “development of a
cancer cluster.”” May 2016 Order 14. This was the totality of the District Court’s
discussion of whether the CUP will endanger the public health. Neither the Appellants’
antibiotic resistance concerns nor the County’s failure to consider such concerns
appeared in the District Court’s Order.5

b. The Dodge County Zoning Ordinance Requires Consideration of
Antibiotic Resistance and Its Public Health Implications.

As part of its authority to carry out planning and zoning activities, Dodge County
may designate a process for permitting “conditional uses.” See Minn. Stat. § 394.301,
subd. 1. The County has made such a designation through its zoning ordinance. See AR
439 (Dodge County Zoning Ordinance § 18.13.8) [hereinafter “Zoning Ordinance”].

“Conditional uses may be approved upon a showing by an applicant that the
standards and criteria stated in the ordinance will be satisfied.” Minn. Stat. § 394.301,
subd. 1. However, the County decision approving a CUP is arbitrary or capricious if,
among other reasons, “it entirely failed to consider an important aspect of the problem.”

5 The District Court may have been referencing the Williamson letter when it wrote,
“Troms and Dodge County Concerned Citizens have presented articles indicating that
‘concentrated animal feeding operations or large industrial farms can cause a myriad of
environmental and public health problems.” May 2016 Order 14. If so, the District
Court’s review skipped over the public health concerns in the letter. The court focused
exclusively on one of the environmental problems identified, simply stating, “there is no
evidence in the record adequate to support a conclusion that this project will damage the
habitat of protected species.” Id. at 14-15 (emphasis in original).
Multiple Zoning Ordinance criteria, which require the County to make findings before it may grant a CUP, encompass the public health threats of increasing antibiotic-resistant bacteria. In relevant part, the Zoning Ordinance states that before approving a CUP, the County Board shall find that:

I. The establishment, maintenance or operation will not be detrimental to or endanger the public health, safety, or general welfare [. . . ]

IV. The proposed use is compatible with adjacent uses of land. The use shall not be substantially injurious to the permitted uses nor unduly restrict the enjoyment of other property in the immediate vicinity. This includes whether the applicant has ensured adequate measures have been or will be taken to prevent or control offensive odor, fumes, dust, noise, and vibration, so that none of these will constitute a nuisance\(^6\) [. . . and]

IX. That existing groundwater, surface water and air quality are or will be adequately protected.

Zoning Ordinance § 18.13.8.

With regard to ordinance criteria like these, this Court has held that “[a] legally sufficient reason [to deny a CUP] is one reasonably related to the promotion of the public health, safety, morals and general welfare of the community.” BECA of Alexandria, LLP v. County of Douglas ex rel. Bd. of Comm’rs, 607 N.W.2d 459, 463 (Minn. App. 2000) (quotation omitted).

\(^6\) The Minnesota Supreme Court has read human health concerns into the “broad language” of another county’s zoning ordinance provision that ensured “that the proposed use will not interfere with neighbors’ enjoyment of their property or create a nuisance.” Schwardt v. County of Wantonwan, 656 N.W.2d 383, 387 (Minn. 2003).
c. The Addition of a Large Hog Feedlot Significantly Increases the Risk of Proliferation of Antibiotic-Resistant Bacteria.

A broad array of scientific research and governmental findings ties antibiotic use in the raising and slaughter of food-producing animals, such as pigs, to increased antibiotic resistance in bacterial populations in animals, the environment, and humans. See, e.g., Timothy A. Johnson et al., Clusters of Antibiotic Resistance Genes Enriched Together Stay Together in Swine Agriculture, 7 mBio e2214-15 (Mar./Apr. 2016) (“In this study, we identify high correlations in the cooccurrence of clusters of identical antibiotic resistance genes (ARGs) and mobile genetic element sequences in Chinese swine farms and farm-impacted soils as well as U.S. laboratory swine.”); Jim O’Neill et al., Tackling Drug-Resistant Infections Globally: Final Report and Recommendations, The Review on Antimicrobial Resistance, at 24 (May 2016). According to a 2014 blue-ribbon report to the President of the United States, “[a]ll uses of antibiotics – whether in human or animal populations – promote the emergence and spread of antibiotic resistance by selecting for microbes able to grow well despite the presence of antibiotics.” John P. Holdren & Eric Lander (co-chairs), President’s Council of Advisors on Sci. & Tech., Report to the President on Combating Antibiotic Resistance 50 (2014) [hereinafter “2014 Report to President”].

7 The Mayo Clinic, located about 20 miles from Dodge County, has on its website an easy-to-understand multimedia description of how antibiotics given to farm animals can lead to illness or even death in humans, titled, “Antibiotic Resistance from Farm to Table.” See Mayo Clinic, “Animal use in agriculture,” available at http://www.mayoclinic.org/diseases-conditions/infectious-diseases/multimedia/img-20144910 (last visited Sept. 15, 2016).
Bacteria are promiscuous organisms that can “adapt rapidly to new environmental conditions and can acquire genes or undergo molecular changes with increasing exposure to antimicrobials in human and veterinary medicine, leading to resistance to these agents.” European Ctr. for Disease Prevention & Control et al., Joint Opinion on Antimicrobial Resistance Focused on Zoonotic Infections 7 (2009) [hereinafter “2009 European Centre for Disease Prevention Opinion”]. Through contact, antibiotic-resistant bacteria can disseminate resistant genes by injecting other bacteria with copies of mobile genetic elements called plasmids—stretches of DNA containing multiple genes, each of which may confer increased resistance to different antibiotics. See U.S. Gov’t Accounting Office, No. GAO-04-490, Antibiotic Resistance: Federal Agencies Need to Better Focus Efforts to Address Risk to Humans from Antibiotic Use in Animals 9 (2004) [hereinafter “2004 GAO Report”]. Bacteria may also develop resistance through mutations in their own DNA. Id.

“The dose of antibiotic and length of time bacteria are exposed to the antibiotic are major factors affecting whether the resistant bacteria population will dominate.” Id. The provision of antibiotics to an entire group of animals at a facility in steady, low doses “strongly encourages” drug resistance, “especially when provided in feed or water, where they remain active and are widely dispersed.” Stuart B. Levy, Multidrug Resistance—A Sign of the Times, 338 New Eng. J. of Med. 1376, 1377 (1998); see also White House, National Action Plan for Combating Antibiotic-Resistant Bacteria 20 (2015) (“Because antibiotics in feed or water are typically administered to herds or flocks of food-producing animals, in-feed or in-water antibiotic use leads to an increased risk of
selecting for resistance'); 2009 European Centre for Disease Prevention Opinion, at 9 ("Flock or herd administration of antimicrobials, which in most cases is given orally is considered one of the most important factors contributing to the selection of antimicrobial-resistant zoonotic bacteria").

Hog feedlot operations are particularly susceptible to the development of antibiotic-resistant bacteria. See Rebecca Goldburg et al., The Risks of Pigging Out on Antibiotics, 321 Science 1294 (2008) (finding 70% of pigs tested in Iowa and Illinois were carrying MRSA); Shylö E. Wardyn et al., Swine Farming is a Risk Factor for Infection With and High Prevalence of Carriage of Multidrug-Resistant Staphylococcus Aureus, 61 Clinical Infectious Diseases 59 (2016). Operators consistently provide antibiotics to their entire herd through feed or water, for both growth-promotion and prevention purposes. See generally, Bengston & Greko, supra note 2.

As a result, it is unsurprising that bacteria with genes resistant to tetracycline and sulfonamide antibiotics—both of which are medically important—have been found in soils adjacent to hog feedlots. See N. Wu et al., *Abundance and Diversity of Tetracycline Resistance Genes in Soils Adjacent to Representative Swine Feedlots in China*, 44 Envtl. Sci. & Tech. 6933 (2010).

Exposure to one antibiotic may “co-select” for resistance to multiple antibiotics. See A. Carattoli, *Plasmids and the Spread of Resistance*, 303 Int’l J. Med. Microbiology 298 (2013). One study of antibiotic resistance on hog farms discovered that “resistance genes found in our samples were not limited to the antibiotics administered,” and stated the phenomenon “is most likely due to aggregation of resistance genes on mobile genetic elements.” Yong-Guan Zhu et al., *Diverse and Abundant Antibiotic Resistance Genes in Chinese Swine Farms*, 110 Proceedings of Nat’l Acad. of Scis. 3435, 3437 (2013). In this way, even feedlots that give animals an antimicrobial class of drug that is not used in clinical medicine may still cause bacteria to select for genes resistant to drugs that are used in medicine. For example, U.S. Department of Agriculture researchers have shown that antibiotics in feed given to hogs cause a significant increase in the abundance of bacteria.

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8 According to one experiment concerning stress and pigs, “only 25% of the pre-stress isolates showed multiple antimicrobial resistance patterns, in contrast to 85% of isolates from post-stress. Moreover, a significant difference was observed for tetracycline resistance between isolates obtained from the carcasses of the control (40%) versus the stressed group (80%), suggesting that stressed animals were shedding higher numbers of resistant bacteria that contaminated the carcasses.” M.H. Rostagno et al., *Split Marketing as a Risk Factor for Salmonella Enterica Infection in Swine*, 6 Foodborne Pathogens & Disease 865 (2009). Tetracycline is a very important antibiotic in human medicine, used to treat *Brucella*, *Chlamydia*, and *Rickettsia* infections. See Word Health Org., Advisory Group on Integrated Surveillance of Antimicrobial Resistance, Critically Important Microbials for Human Medicine 7, 20 (2011).
genes resistant to antibiotics not appearing in the feed. Torey Looft et al., *In-Feed Antibiotic Effects on the Swine Intestinal Microbiome*, 109 Proceedings of the Nat’l Acad. of Scis. 1691 (2012). Similarly, treating chickens with antibiotic streptomycin not only selects for bacteria with streptomycin resistance, but can also create resistance to sulfonamides, an unrelated class of antibiotics considered very important to human medicine. M. Faldynova et al., *Prevalence of Antibiotic Resistance Genes in Faecal Samples from Cattle, Pigs and Poultry*, 58 Veterinarni Medicina 298 (2013).

The antibiotic-resistant bacterial populations in food-producing animals are capable of transferring to humans. *See, e.g.*, FDA Guidance for Industry #209, *The Judicious Use of Medically Important Antimicrobial Drugs in Food-Producing Animals* 12 (Apr. 2012) (performing literature review and describing, among others, the 2004 GAO Report, which definitively concluded that “antibiotic-resistant bacteria have been transferred from animals to humans”). A recent study of veterans in rural Iowa found that the frequency of antibiotic-resistant Staphylococcus aureus was 88% higher among veterans living within one mile of high-density hog feedlots. M. Carrell et al., *Residential Proximity to Large Numbers of Swine in Feeding Operations is Associated with Increased Risk of Methicillin-Resistant Staphylococcus Aureus Colonization at Time of Hospital Admission in Rural Iowa Veterans*, 35 Infection Control & Hosp. Control Epidemiology 190 (2014).

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9 According to the District Court, the Appellant Troms and other neighbors live within one mile of the Masching feedlot at issue here. *See* May 2016 Order 16 n.13.

When applied on land, the manure and its antibiotic-resistant bacteria can enter the soil, groundwater or surface water through runoff. *Id.* According to an article that Appellants identified in the Administrative Record, “genes resistant to tetracycline, a common antibiotic, have been found in groundwater as far as a sixth of a mile downstream from two swine facilities that use antibiotics as growth promoters.” Envtl. News Service, “Antibiotic Resistant Genes Traced from Farms to Groundwater,” May 1, 2001 (listed on AR 69); see also Bridgett M. West et al., *Antibiotic Resistance, Gene Transfer, and Water Quality Patterns Observed in Waterways near CAFO Farms and Wastewater Treatment Facilities*, 217 Water, Air, & Soil Pollution 473, 473 (May 2011) (studying six sites in Michigan and finding results that “indicate that CAFO farms not
only impair traditional measures of water quality but may also increase the prevalence of multi-drug-resistant bacteria in natural waters”).

Bacteria also enter into soil “when manure from antibiotic-fed animals is land applied as a source of crop nutrients.” Chander et al., 34 J. Envtl. Quality at 1952 (listed on AR 069). A 2005 study found that two antibiotics used in hog production, tetracycline and tylosin, remained active in soil, allowing for “emergence of antibiotic resistant bacteria in the environment.” Id. at 1956. In addition, antibiotics and antibiotic-resistant bacteria in soil can contaminate plants grown on the manure-applied lands, such that “[a]ntibiotics present in plant materials ingested by humans may provide resistance to human pathogens thus resulting in illnesses that may be difficult to cure with presently available antibiotics.” Kumar et al., 34 J. Envtl. Quality at 2084 (listed on AR 069); see also 2014 Report to President at 50-51 n.84.

Second, antibiotic-resistant bacteria can enter the air, where they can infect feedlot workers and neighbors. According to a description of a Johns Hopkins study of air inside large-scale hog production facilities, which Appellants also identified in the Administrative Record, “bacteria resistant to at least two antibiotics [appeared] in air samples collected from inside” the facilities. Science Daily, “Multidrug-Resistant Bacteria Found to be Airborne in Concentrated Swine Operation,” available at https://www.sciencedaily.com/releases/2004/12/041206213925.htm (last visited Oct. 7, 2016) (listed on AR 070). The finding led researchers to believe that feedlot workers have a great risk of airborne exposure to antibiotic-resistant bacteria, and “may also become reservoirs of drug-resistant bacteria that can be spread to family and the broader
community.” Id.; see also Gerd Hamscher et al., *Antibiotics in Dust Originating from a Pig-Fattening Farm*, 111 Envtl. Health Perspectives 1590, 1592 (2003) (finding that “dust originating from a pig-fattening farm represents a new route of entry into the environment for drugs applied in animal houses,” which poses a risk of antibiotic resistance in humans from dust inhalation); Jessica L. Rinsky et al., *Livestock-associated Methicillin and Multidrug resistant Staphylococcus aureus is Present among Industrial, Not Antibiotic-free Livestock Operation Workers in North Carolina*, 8 PloS ONE e67641 (2013) (finding MRSA transferred from livestock to workers).

Downwind neighbors can also be exposed to antibiotics and antibiotic-resistant bacteria present in dust. See generally, Eva Hershaw, “When the Dust Settles,” Texas Monthly (Sept. 2016) (describing 2011 event in Missouri, where a tornado carried a fungus and antibiotic-resistant bacteria “over long distances”). According to a recent study, “feedlot-derived microbes, including those possessing antibiotic resistance, can be transported to new locations where they may occupy new niches.” See A.D. McEachran et al., *Antibiotics, Bacteria, and Antibiotic Resistant Genes: Aerial Transport from Cattle Feed Yards via Particulate Matter*, 123 Envtl. Health Perspectives 337, 342 (2015).

Third, bacteria that develop antibiotic resistance in animals can affect public health through human handling and consumption of meat. 2004 GAO Report at 11. “Most food-borne infections originate from faecal contamination of carcasses during slaughter or cross-contamination during subsequent processing.” 2009 European Centre for Disease Prevention Opinion at 8-9. The Centers for Disease Control and Prevention (“CDC”) observed that in 2015, 192 cases and 30 hospitalizations arose from antibiotic-

Upon human exposure, the resistant bacteria, or “superbugs,” can colonize the human gut and cause illnesses resistant to clinically important antibiotics. See Mayo Clinic, “Antibiotic resistance: Understanding the connection to antibiotic use in animals raised for food,” available at http://www.mayoclinic.org/diseases-conditions/infectious-diseases/in-depth/antibiotic-resistance/art-20135516; see also 2009 European Centre for Disease Prevention Opinion at 9 (“[H]umans can become more susceptible to infection with antimicrobial-resistant zoonotic bacteria to which they are exposed”).

Thus, according to the President of the United States, antibiotic-resistant bacteria from animal agriculture pose a serious threat to public health, and “[c]ombating antibiotic resistant bacteria is a national security policy,” Exec. Order No. 13676 (Sept. 18, 2014) (citing CDC estimates that annually at least two million illnesses and 23,000 deaths are caused by antibiotic-resistant bacteria alone); see id. §§ 5, 7. Scientists have estimated that, by 2050, antimicrobial resistance would be related to ten million deaths per year, overtaking the current rates of cancer-related deaths. Jim O’Neill, Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations, Review on Antimicrobial Resistance, at 5 (Dec. 2014). The threat of antibiotic-resistant bacteria to public health—especially to the health of feedlot workers and neighbors—is so severe that the American Public Health Association has issued a policy document calling on
“federal, state and local governments to impose a moratorium on new Concentrated
Animal Feed Operations.” See Am. Pub. Health Ass’n Policy 2003-7.\(^\text{10}\)

The continuous provision of antibiotics to food-producing animals such as pigs also increases the risk of harm to the animals themselves. A number of different contagious bacterial diseases cause suffering in animals raised for food. See J. Vaarten, *Clinical impact of antimicrobial resistance in animals*, 31 Scientific and Technical Review of the Office International des Epizooties 221 (2012). As the blue-ribbon panel reporting to the President acknowledged, “antibiotic resistance also limits the therapeutic effectiveness of antibiotics in animals themselves; this further supports the need to reduce resistance in animal agriculture.” 2014 Report to President at 51. MRSA has become common among pigs. See Verkade & Kluymans, *Livestock-associated Staphylococcus*


Here, the Masching feedlot is certain to increase the number of bacteria in the area, which will develop antibiotic resistance. As the District Court observed in colloquy with Appellants’ counsel, the area around the Masching feedlot is saturated with other feedlots and the manure they produce. See Mot. Summ. J. Hearing Tr. 40-41. Moreover, the District Court concluded that the manure from the Masching facility alone will be spread over at least 244 acres, and near manure coming from other feedlots. May 2016 Order 9-11. As explained above, the bacteria in the Masching manure can interact with other feedlot manure to share or accept new antibiotic resistance, and can easily enter the soil, crops, groundwater and waterways—environmental pathways to the surrounding human population. Moreover, the Masching feedlot neighbors—including Appellants, who are older and, thus, more susceptible to illness—live quite close. Cf. M. Carrell et al., 35 Infection Control & Hospital Control Epidemiology 190 (Iowa study finding higher percentage of veterans with MRSA living within one mile of hog confinement facilities). The threat of antibiotic-resistant bacteria poses a “salient problem” to which the County must give a “hard look.” See Pope County Mothers, 594 N.W.2d at 236.
d. The County Decision to Approve the Masching Feedlot Conditional Use Permit without Any Consideration to the Risk of Increased Antibiotic Resistance Was Arbitrary and Capricious.

Neither the County Planning Commission nor the Board considered the increased presence of antibiotic-resistant bacteria, even though the County is tasked with ensuring the protection of public health when evaluating a CUP application. See Section II.a-b, supra. For example, the County failed to investigate how, if at all, Masching plans to protect its workers and neighbors from exposure to antibiotic-resistant bacteria. See generally, AR 779-81, 785-86, 884-971, 986-1007. And despite the fact that continuous use of antibiotics is common at facilities like the Maching feedlot, see notes 2 and 10, supra, the County did not even ask the obvious questions of whether Masching plans to feed its hogs antibiotics, and assuming so, what kinds of antibiotics, and for what duration. See AR 779-81, 785-86, 884-971, 986-1007. By overlooking the public health risk that the Masching feedlot will increase the threat of antibiotic resistance in the community, and the risk that antibiotic-resistant bacteria will enter the local environment, the County bypassed multiple specific requirements in its own ordinance. See Zoning Ordinance § 18.13.8(A)(I), (IV), (IX). The County, therefore, acted arbitrarily and capriciously because it “entirely failed to consider an important aspect of the problem.”

See Pope County Mothers, 594 N.W.2d at 236; BECA of Alexandria, 607 N.W.2d at 463.

11 Appellants and other local residents raised the issue of how the Masching CUP will contribute to the spread of antibiotic-resistant bacteria early and often. See Section II.a, supra (describing comments from the community concerning antibiotic resistance during the County’s consideration of both the Masching 2014 and 2016 CUP applications). Defendant Masching had plenty of opportunities to remove the public health threat of antibiotic resistance as an issue by disclaiming plans to use continuous doses of antibiotics at the feedlot, but never did so.
III. THE DISTRICT COURT'S STANDARD OF REVIEW WAS FAR TOO DEFERENTIAL TO COUNTY DECISION-MAKERS.

The District Court applied an overly deferential standard in reviewing the County's approval of the Masching CUP. Referencing Schwardt v. County of Wantonwan, the District Court stated that it would provide heightened deference to the local authority for the approval of a CUP. May 2016 Order 4. But the Supreme Court's directions on deference to CUP approvals are not so clear cut. In fact, by providing more judicial deference to a CUP approval than it would provide to a CUP denial, and consequently blessing the CUP approval even though the County completely failed to consider an important public health issue, the District Court contravened core principles of Minnesota administrative law.

In Schwardt, the Minnesota Supreme Court acknowledged it had “traditionally held CUP approvals to a more deferential standard of review than CUP denials.” 656 N.W.2d at 389 n.4 (citing Interstate Power Co. v. Nobles County Bd. of Comm'rs, 617 N.W.2d 566 (Minn. 2000) and Corwine v. Crow Wing County, 244 N.W.2d 482 (Minn. 1976)). The Court still accepted the deferential standard because “[n]either party argued that this distinction is unwarranted.” Id. This observation that a “traditional” standard of review went uncontested suggests that the Supreme Court may not believe there is a valid reason for the distinction in judicial deference between CUP approvals and CUP denials.

The Schwardt decision cites two cases—Interstate Power and Corwine—for why courts have “traditionally” applied a heightened deference standard of review to CUP approvals. Both cases explain that “[w]hen a use permit is approved, the decision-making
body is always implicitly giving the same reason – all requirements for the issuance of the permit have been met.” *Corwine*, 244 N.W.2d at 486; *see also Interstate Power*, 617 N.W.2d at 579-80.

But the *increase* of deference to an administrative entity, based on the assumption that the entity considered all relevant issues *sub silentio*, conflicts with administrative law doctrines.

According to the Minnesota Supreme Court, judicial deference to an agency is “rooted in the separation of powers doctrine and the agency’s training and expertise in the subject matter.” *In re City of Annandale*, 731 N.W.2d 502, 512 (Minn. 2007). Agencies deserve deference when they employ their expertise and “special knowledge in the field of their technical training, education, and experience.” *Reserve Mining Co. v. Herbst*, 256 N.W.2d 808, 824 (Minn. 1977). Thus, to receive judicial deference, the County must actually engage with the issues within its field of expertise—it “necessarily requires application of the agency’s technical knowledge and expertise to the facts presented.” *Minn. Ctr. for Envtl. Advocacy (MCEA) v. MPCA*, 644 N.W.2d 457, 464 (Minn. 2002).

Indeed, the requirement that an agency must actually *apply* its technical training and expertise to the facts of the controversy to receive judicial deference is a corollary to the “arbitrary and capricious” standard of review in administrative law. “An agency’s decision is arbitrary or capricious if the agency relied on factors the legislature never intended it to consider, if it entirely failed to consider an important aspect of the problem, if it offered an explanation for the decision that runs counter to the evidence, or if the decision is so implausible that it could not be ascribed to a difference in view or the result
of agency expertise.” In re Block, 727 N.W.2d 166, 177-78 (Minn. App. 2007). Similarly, courts will intervene “when a ‘combination of danger signals . . . suggest the agency has not taken a hard look at the salient problems’ and the decision lacks ‘articulated standards and reflective findings.’” MCEA v. City of St. Paul Park, 711 N.W.2d 526, 534 (Minn. App. 2006) (quoting Reserve Mining Co., 256 N.W.2d at 825). The presumption against deference in the absence of agency findings reflects the “general rule” that an agency “should state with clarity and completeness the facts and conclusions essential to its decision so that a reviewing court can determine from the record whether the facts furnish justifiable reason for its action.” Minn. Transitions Charter Sch. v. Minn. Dep’t of Educ., 2004 Minn. App. LEXIS 525, *10 (Minn. App. May 11, 2014). Judicial review has no meaning if the decision-making record is absent a key issue relevant to the decision.

Thus, a County cannot receive heightened deference for approving a CUP based on an assumption that the County’s approval implicitly—i.e., silently—found that all relevant issues underlying the required criteria have been considered. Because a CUP is a variation from a normal land use, county ordinances contain material obligations, and applicants must demonstrate that all of the “standards and criteria stated in the ordinance will be satisfied.” Minn. Stat. § 394.301, subd. 1 (emphasis added); see also RDNT, LLC v. City of Bloomington, 861 N.W.2d 71, 78 (Minn. 2015) (explaining that the “burden was on [the applicant] to show that it could satisfy the standards specified by ordinance”).

12 A CUP approval requires the county to ensure that an applicant satisfy each and every standard set out in a county ordinance, and a CUP denial only requires the county to find
Courts cannot assume, without any showing in the record, that applicants, and the county agencies that approved the applicants’ permits, have met their burden. See Murphy v. Comm’r of Econ. Sec., 1998 Minn. App. LEXIS 1125, *15-16 (Minn. App. Oct. 6, 1998) (“Although our standard of review is deferential and we afford due regard to agency expertise, due process prohibits us from affirming a factual finding based on an entirely silent record where the underlying facts are not of such common knowledge that we may take judicial notice of them’’); see also Loncorich v. Buss, 868 N.W.2d 755, 765 (unpublished Minn. App. 2015) (Hudson, concurring) (“[O]ur courts should require more by mandating that CUP applicants strictly comply with ordinance requirements by submitting all required information with the application so that a full, meaningful hearing on the merits can be properly conducted”) (emphasis added). As the Minnesota Supreme Court has explained, such a judicial assumption unfairly makes Appellants guess at an agency’s reasons while also endorsing post hoc agency rationalizations:

[A]n appellant in this situation must intuit the rationale for the agency’s decision and prepare argument based on their speculation as to the agency’s thinking. The agency, on the other hand, is able to rationalize its decision in retrospect and in direct response to an appellant’s contentions. Sanctioning this procedure would be unfair to appellants and runs the risk inherent in any opportunity to rationalize or justify what one has done before.

Reserve Mining Co. v. MPCA, 364 N.W.2d 411, 415 (Minn. 1985) (internal quotation omitted).

the applicant to fall short of one ordinance standard. See Minn. Stat. § 394.301, subd. 1; see also Schwart, 656 N.W.2d at 387 (explaining how a county acts unlawfully if it approves a CUP application that does not meet one of the standards set out in ordinance). Thus, if courts must apply different levels of deference to county CUP decisions, one would expect CUP application denials to receive more deference than approvals.
Increased deference, premised on the assumption that the County considered and determined that the CUP applicant met all ordinance criteria, is especially inappropriate for the facts here. Masching filed the application at issue on November 20, 2014. The very next day, well before the public had time to submit comments, the County had already prepared a Staff Report recommending approval of the CUP. See AR 199. After denying requests to extend the permit application consideration period, the County Planning Commission approved the CUP on December 11, 2014, a mere 13 business days after the application was filed. See AR 530-31, 1008-09. This short turnaround between application and approval does not and cannot “implicitly” suggest that the County considered all Zoning Ordinance criteria and assured itself that the application met them. To the contrary, as the District Court found, the County took a “cart-ahead-of-the-horse approach to CUP analysis and approval,” thinking “it could act on a CUP application without having information important to the question of its issuance.” May 2016 Order 7. The County did not apply technical knowledge and expertise to the facts presented. See, e.g., Section II, supra (detailing how the County did not confront the serious public health concerns presented during the CUP application process, including concerns about how CUP approval might lead to increased antibiotic resistance in the area). Accordingly, the County does not deserve more judicial deference for approving the Masching CUP application than it would have received for a denial. See City of Annandale, 731 N.W.2d at 512.13

13 Moreover, there is no evidence of any Dodge County legislative intent for applying increased deference to a CUP approval. The CUP judicial review provision of the Zoning
IV. CONCLUSION.

The development of antibiotic resistance from pig feedlot operations is a serious threat to public health and animal welfare. The District Court erred when it did not find that the County had failed to evaluate the critical health risk that the Masching feedlot may pose to its workers, neighbors, and consumers. Moreover, the District Court afforded far too much deference to the County, even in the face of a complete lack of evidence in the decision-making record of any consideration of a crucial public health concern, in reviewing the County’s CUP approval decision. For the foregoing reasons, this Court should reverse the District Court’s decision upholding the County’s approval of the Masching CUP.

Respectfully submitted,

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Ordinance, titled “Appeal of County Board Decision,” makes no distinction between review of a CUP approval and a CUP denial. See Zoning Ordinance § 18.13.12 (“Any aggrieved person or persons, or any department, board or commission of the jurisdiction, or of the state shall have the right to appeal the decision of the County Board to the District Court on questions of law and fact”).
CERTIFICATE OF BRIEF LENGTH

I hereby certify that this brief conforms to the requirements of Rule 132.01 of the Minnesota Rules of Civil Appellate Procedure. The length of this brief is 6,974 words.

The brief was prepared using Microsoft Word 2010.

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABLE OF AUTHORITIES</td>
<td>ii</td>
</tr>
<tr>
<td>INTEREST OF AMICUS CURIAE</td>
<td>iii</td>
</tr>
<tr>
<td>ARGUMENT</td>
<td>4</td>
</tr>
<tr>
<td>CONCLUSION</td>
<td>10</td>
</tr>
<tr>
<td>CERTIFICATION OF BRIEF LENGTH</td>
<td>12</td>
</tr>
</tbody>
</table>
### TABLE OF AUTHORITIES

#### CASES

*Big Lake Assoc. v. St. Louis County Planning Comm.*, 761 N.W.2d 487 (Minn. 2009). ................................................................. 5
INTEREST OF AMICI CURIAE

Jillian P. Fry, Ph.D., MPH, Robert S. Lawrence, MD, Claire M. Fitch, MSPH, and Carolyn R. Hricko, MPH are faculty and/or researchers World Health Organization study the food system and public health. They are all affiliated with the Johns Hopkins Center for a Livable Future ("CLF"). Within this brief, these amici will refer to themselves as the "Public Health Amici."

CLF is an interdisciplinary academic center based within the Johns Hopkins Bloomberg School of Public Health, which applies scientific, policy, and regulatory expertise to issues surrounding food systems and public health. http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/. CLF engages in research, policy analysis, education, and other activities guided by an ecological perspective that diet, food production, the environment, and public health are interwoven elements of a complex system. The Public Health Amici recognize the prominent role that food animal production plays with regard to a wide range of public-health concerns within and associated with that system.

Dr. Jillian P. Fry, Ph.D., MPH, directs the CLF’s Public Health & Sustainable Aquaculture Project, and is an Assistant Scientist in the Departments of Environmental Health Sciences and Health, Behavior, and Society at the Johns Hopkins Bloomberg

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1 No counsel for any party authored this brief in whole or in part. No person or entity other than Amici, or its counsel, made any monetary contribution to the preparation or submission of this brief.

2 The views of these amici do not necessarily reflect the views of Johns Hopkins University.
School of Public Health. Dr. Fry’s research focuses on the effects of industrial food animal production (including aquaculture) on environmental public health, especially regarding resource use, effectiveness of regulations, and understanding policy processes relevant to food-animal production at the local, state, and federal levels. She has published 5 peer-reviewed journal articles on issues related to the environmental and public-health impacts of industrial food animal production. Dr. Fry also coordinates CLF’s response to requests for technical assistance from community members, non-governmental organizations, and other stakeholders who are seeking a public health professional to interpret the scientific evidence on industrial food-animal production. (7/25/16 Palmer Aff., Exhibit 4, Curriculum Vitae of Jillian P. Fry).

Dr. Robert S. Lawrence, MD, is a Professor Emeritus of Environmental Health Science and International Health at the Johns Hopkins Bloomberg School of Public Health. He is also a Professor of Medicine at the Johns Hopkins School of Medicine. Dr. Lawrence is a graduate of Harvard College and Harvard Medical School, and trained in internal medicine at the Massachusetts General Hospital in Boston, Massachusetts. Dr. Lawrence founded the Center for a Livable Future in 1996, served as director until 2015, and has published 8 peer-reviewed articles directly related to the environmental and health impacts of industrial food-animal production. Before joining the Johns Hopkins Bloomberg School of Public Health and starting the CLF, Dr. Lawrence spent many years advancing the field of public health via leadership positions at multiple organizations, including the U.S. Centers for Disease Control and Prevention, the University of North Carolina Chapel Hill, Harvard Medical School, Cambridge Hospital,
the U.S. Preventive Services Task Force, and the Rockefeller Foundation. (See July 25, 2016 Affidavit of Kris Palmer in Support of Amicus Petition, Exhibit 1, Biographical Sketch of Robert S. Lawrence).

Ms. Claire M. Fitch, MSPH, is a Program Officer in the Food System Policy Program at the Johns Hopkins Bloomberg School of Public Health. In this position, Ms. Fitch has conducted literature reviews, and provided public comment and testimony on the public health impacts of industrial hog, turkey, and broiler-chicken production in the U.S. Prior to joining the CLF, Ms. Fitch was a U.S. Borlaug Fellow in Global Food Security with the USAID Nutrition Innovation Lab. (7/25/16 Palmer Aff., Exhibit 5, Curriculum Vitae of Claire M. Fitch).

Ms. Carolyn R. Hricko, MPH, is a Research Assistant in the Food System Policy Program at the Johns Hopkins Bloomberg School of Public Health. Ms. Hricko has a background in global health and sustainability, and has conducted literature reviews on air pollution and other environmental and public health impacts of industrial hog, turkey, and broiler-chicken production and processing in the U.S. (7/25/16 Palmer Aff., Exhibit 6, Curriculum Vitae of Carolyn R. Hricko).

The Public Health Amici assert a public interest. The Dodge County Ordinances at issue in this case required compliance with U.S. and state environmental laws, and the permit at issue in this appeal has broad implications for Dodge County, other counties in Minnesota, and rural areas across the U.S. Through this brief, the Public Health Amici provide interpretation of relevant scientific evidence regarding the public-health and community impacts of industrial-scale hog production.
RECORD FACTS THAT DEMONSTRATED THE LIKELIHOOD OF NEGATIVE PUBLIC HEALTH EFFECTS

The administrative record contained substantial evidence that demonstrated a high likelihood of negative public-health effects caused by industrial-scale hog production such as the one at issue in this case.

Masching Hog Farm (hereinafter, “Masching”) proposed to build a facility that would house 2,400 hogs. Each hog generates as much waste as three people. So the Masching proposal amounted to the equivalent of a housing project that would house 7,200 people for 24 hours a day, seven days a week, 365 days a year.

Per the Masching proposal, all of those 7,200 people’s feces and urine would remain onsite, in a concrete pit underneath their living space, with open-air slats to allow for ventilation of the excrements’ gases. (Id. at AR-780-82). This hypothetical housing project’s waste would remain in that pit for up to a year at a time. (Id. at 782). By the end of each year, this “housing project’s” occupants would have produced an estimated 1.14 million gallons of liquid waste composed of excrement and urine. (Id. at AR-812).

Such waste breaks down, and as it does, it releases toxic gases, including ammonia, hydrogen sulfide, and methane. (AR-647). All of these gases are potentially explosive, which poses an obvious risk to public health. And the evidence presented to the County specifically described how two of these gases --- ammonia and hydrogen sulfide --- directly affect human health with repeated exposure, even at low doses. (Id. at AR-646-48).
The evidence presented to the County showed that ammonia is an irritant that causes chemical burns to the respiratory tract, skin, and eyes. (Id. at 646). At high concentrations, it generates a severe cough, and chronic exposures to levels as low as 0.5 mg/m3 can result in decreased lung function and respiratory system.

Those at highest risk are children and the elderly. The evidence presented to the County showed that children who are regularly proximate to operations like the Masching’s are more likely to develop asthma (a chronic lung disease that can affect said children for the rest of their lives), and bronchitis. Chronic lung disease can, and often does, kill the elderly. (AR-647).

The evidence presented to the County also showed that hydrogen sulfide causes inflammation of the moist membranes of the eyes and respiratory tract, and olfactory neuron loss. (Id.). It has an extremely noxious “rotten egg” odor. Studies presented to the County showed that this odor is so noxious that repeated exposure (merely due to the odor) can pose risks to mental health. And data submitted to the County showed that the odors from industrial hog operations such as the Masching’s can be detected from as far away as six miles.

The County received evidence demonstrating that 1.1 million gallons of hog waste would be expected to generate significant amounts of ammonia and hydrogen sulfide. Such gases are so concentrated in facilities such as the Masching’s, that the latters’ designs must incorporate powerful ventilation systems, lest the hogs die due to exposure to the gases produced by their own decomposing bodily waste.
These necessary ventilation systems pump the bodily waste materials into the air around the facility, and until these gases disperse, nearby properties experience continuously elevated exposure to them, thereby increasing the properties’ inhabitants’ risk of chronic respiratory illnesses, changes to mental health, and even death.

As one would expect with a 7,200-occupant human housing project, the occupants of such high-density hog facilities are at increased risk of disease from various pathogens, including bacteria and viruses. One of the most commonly found bacteria is *Staphylococcus aureus*. *Staphylococcus aureus* is a pathogen responsible for a significant burden of skin infections and respiratory disorders.

In order to protect the animals (as well as enhance their growth), it is commonplace to feed them antibiotics. The evidence presented to the County included data showing that such feeding practices increase the risk of antibiotic resistance, and that therefore such facilities result in increased local risk of exposure to various antibiotic-resistant bacterial infections, including infections with Methicillin-Resistant *Staphylococcus aureus*, or “MRSA.”

MRSA is a resistant strain of an otherwise-common bacterium. It can be life-threatening. In the elderly, it can cause life-threatening antibiotic-resistant pneumonia. In both elderly and younger people, it can cause severe skin infections, including necrotizing fasciitis, a severe type of skin infection that spreads quickly, and kills the body’s soft tissues. MRSA is one of the so-called “flesh-eating bacteria.”

In addition, pigs are one of the world’s greatest sources of zoonotic diseases (i.e., viral or bacterial diseases that may be spread between animals and humans). Zoonotic
diseases may be spread via contaminated water sources, air, and insect vectors. And the evidence presented to the County showed that large, concentrated hog facilities, such as the Masching’s, are breeding grounds for these zoonotic diseases.

To be fair, the County ultimately required some preventatives to avoid public health insult. But the County did not require (and therefore, the record does not include) any data from which the County (or a reviewing court) could reasonably assess whether the Masching’s proposal would affect water or air quality, or whether the presence of this facility would pose a health risk to nearby residents.

ARGUMENT

The Dodge County Zoning Ordinance criteria for granting a Conditional Use Permit includes determinations that the project will not be detrimental to or endanger public health and that groundwater, surface water, and air quality will be protected. *(Id. at AR-355).*

In the Planning Commission Meeting and Dodge County Board Meeting minutes *(Id. at AR-29 and AR-77)*, it is apparent that public-health issues were not discussed. The offset determination by the County Feedlot Officer that the site was “98% odor annoyance free” is not a robust analysis and fails to consider air emissions during manure removal and spreading, the compounded odor effects of the animal density in that area, the public-health impacts of gases and particulate matter associated with odor, and the offset under various weather conditions. In short, this data cannot be deemed a sufficient amount of evidence for a local authority to determine that a project will not be detrimental to public health.
The district court properly described a court’s standard of review of a county’s decision. That standard of review includes appropriate deference to the County. Such deference is necessary to preserve separation of powers. See, e.g., Big Lake Association v. Saint Louis County Planning Commission, 761 N.W.2d 487, 490-91 (Minn. 2009).

But in this case, the County undertook to protect public health. The state regulatory agencies assumed that the County would honor that undertaking. Where, as here, local governments like the County fail to give a hard look at proposals that endanger public health, court intervention is appropriate.

I. Air quality is a public-health issue, not a “nuisance.”

The Masching’s proposal is a medium-to-large scale hog feedlot. Such facilities are often described as Concentrated Animal Feeding Operations, or “CAFOs.”

Gaseous emissions from hog feedlots primarily come from decomposing manure. When underground storage is used, gases are released by ventilation systems, manure removal, and during spreading. Such feedlot buildings also disseminate gases and particulate matter (Id. at AR-652). Major air pollutants from hog feedlots and the resulting public health risks are summarized in the NALBOH review (Id. at AR-652-654) and GRACE Communications Materials (Id. at AR-632-634). Main air emissions include hydrogen sulfide, ammonia, particulate matter, endotoxins, and methane.

One study, submitted below, identified 331 fixed gases and volatile organic compounds (VOCs) in air samples near North Carolina farms. A North Carolina State University study found that when human subjects were exposed to simulated feedlot emissions in a field laboratory for one hour, subjects were 4.1 times more likely to
develop headaches, 6.1 times more likely to report eye irritation, and 7.8 times more likely to report nausea than those in a control group (breathing clean air). \textit{(Id. at AR-633).} Some of the health conditions associated with exposure to feedlot emissions include asthma symptoms, bronchitis, nasal irritation, diarrhea, hoarseness, sore throat, cough, chest tightness, nasal congestion, palpitations, shortness of breath, stress, drowsiness, and alteration in mood. \textit{(Id.).}

Decomposing hog manure emits hydrogen sulfide, a colorless gas that limits cells’ ability to use oxygen. This gas is particularly dangerous because the intensity of its odor only slightly increases at levels above 6 parts per million (ppm), and can reduce individuals’ sense of smell at concentrations of 150 ppm or higher. Exposure to 500 ppm or higher is likely to be lethal. Exposure at low levels is associated with chronic cough, throat irritation, eye symptoms, nasal symptoms, headache, low blood pressure, and psychological disorders. Exposure is also linked to nausea, stomach distress, and blistering of the lips. Exposure to high levels can cause skin, eye, and respiratory irritation, neurologic and cardiac disorders, loss of consciousness, shock, pulmonary edema, seizures, comas, and death. Minnesota’s Pollution Control Agency has documented hydrogen sulfide concentrations in excess of World Health Organization maximum exposure standards on properties near hog feedlots \textit{(Id. at AR-634).}

Ammonia, emitted via manure decomposition, is absorbed in the upper airways and exposure can cause wheezing, shortness of breath, chronic lung disease, and irritation of the eyes, throat, respiratory system, sinuses and skin. Exposure to moderate concentrations of ammonia (50-150 ppm) can cause severe cough and mucous production
and exposure to concentrations higher than 150 ppm can cause scarring of the upper and lower airways, reactive airways dysfunction syndrome (RADS), persistent airway hypersensitiveness, lower lung inflammation, and pulmonary edema. Exposure to extremely high concentrations of ammonia can be fatal.

Detection of odor from hog feedlots indicates exposure to one or more of the gases described above, and may also mean that particulate matter and endotoxins are present. Regular exposure to particulate matter — which may include fecal matter, feed materials, skin cells, and pathogens — is linked to bronchitis, asthma, chronic respiratory symptoms, organic toxic dust syndrome, and cardiac disorders (including arrhythmia and heart attacks). Endotoxins may also be present in particulate matter and can cause respiratory problems even in extremely low concentrations.

II. The county also failed to consider evidence of substantial public-health impacts from pathogens.

After the Plaintiffs’ Motion for Summary Judgment was granted and the Maschings’ Conditional Use Permit vacated (Id. at AR-330), Nick Masching reapplied for a CUP with additional information (Id. at AR-128), including a geotechnical evaluation and a manure management plan. No additional information was provided to satisfy the zoning ordinance criteria that the project would not be detrimental to or endanger public health or air quality. The Planning Commission granted a CUP, citing the additional information contained in the second application, despite the continued lack of materials related to public health and/or air quality.
Based on the NALBOH report and information from the GRACE Communications Foundation submitted below, there is ample evidence contained in the record showing that large-scale animal operations are a serious threat to public health, especially when geographically clustered. This information is widely available, from these sources and many others, and should have been considered by Dodge County when making a decision about granting the CUP. For Dodge County to approve numerous hog feedlots and be in compliance with their zoning ordinance that claims to protect public health, air, and water, robust monitoring and action plans should be in place to track levels of common contaminants from feedlots and to respond if/when air and/or water are contaminated by the large-scale hog operations in Dodge County. Under current regulations, once the CUP is granted there are very minimal air regulations due to a significant exemption for feedlots (Id. at AR-578) and oversight of manure management relies heavily on record keeping and voluntary compliance (Id. at AR-574-578).

The evidence presented to the County showed that over 150 disease-causing bacteria, viruses, and other pathogens can be found in animal manure and can be transferred to people through fecal-oral transmission and exposure to contaminated air, drinking water, and recreational water. (Id. at AR-655-657). The crowded conditions in confined animal feeding operations like the Masching’s proposal present frequent opportunities for the transmission of pathogens among animals, and between animals and humans.

While exposure to these pathogens poses a risk to healthy people, those with compromised immune systems, such as pregnant women, infants and young children, the
elderly and those who are HIV positive or have had chemotherapy, are at even greater risk of severe illness or death. Widespread disease outbreaks, such as salmonellosis, cryptosporidiosis and giardiasis, can result from exposure to water contaminated by pathogens.

These diseases cause symptoms ranging from nausea, vomiting and diarrhea, to dehydration, fever, and muscle pain and may result in death. Industrial hog operations also present opportunities for the replication, mutation, and recombination of viruses that can result in the development of novel viruses, some of which may lead to more efficient human-to-human transmission. (Id. at AR-657).

Antibiotics are routinely administered through animal feed, sometimes at non-therapeutic doses to promote growth and/or prevent disease. The evidence presented to the County showed that approximately 70% of all antibiotics and related drugs in the U.S. each year are sold for use in food animals, and more than half of those antibiotics are considered important in human medicine. There is strong evidence that the use of antibiotics in food animal production contributes to antibiotic resistance in bacteria and decreases the effectiveness of antibiotics in human medicine. This threatens human health because fewer options exist to help people overcome disease when infected with antibiotic-resistant pathogens. Moreover, antibiotics are often not fully metabolized by animals and can be present in manure. If manure pollutes a water supply, antibiotics can also leech into groundwater or surface water. Because of this concern for human health, there is a growing movement to eliminate the routine use of antibiotics in food animal production.
The NALBOH report, presented to the County, mentions opposition to the use of non-therapeutic antibiotics in animal agriculture by the American Medical Association and World Health Organization. (Id. at AR-657). In the fall of 2013, a research study titled “High-Density Livestock Operations, Crop Field Application of Manure, and Risk of Community-Associated Methicillin-Resistant Staphylococcus Aureus Infection in Pennsylvania” was published in JAMA Internal Medicine (a leading journal published by the American Medical Association).

The study focused on rates of MRSA infection, a type of bacteria resistant to some medically-important antibiotics, among residents living various distances from industrial hog operations and spray fields. The study had the following conclusion: “Proximity to hog manure application to crop fields and livestock operations each was associated with MRSA and skin and soft-tissue infection. These findings contribute to the growing concern about the potential public health impacts of high-density livestock production.”

In addition, the World Health Organization identified antimicrobial resistance (a term used widely in recent years that includes antibiotic resistance) as “one of the biggest threats to global health” in the fall of 2016. The World Health Organization recognizes misuse of antimicrobials in animal agriculture for the purpose of growth promotion as a major cause of global antimicrobial resistance.

CONCLUSION

The Public Health Amici urge this court to examine the record before the County, below. That record included ample scientific evidence to support an inference that the proposed facility would endanger public health. The evidence submitted to the County
demonstrated a significant risk of injury due to lowered air quality. It also demonstrated a significant risk of antimicrobial resistance and increasingly dangerous pathogens.

Where, as here, local officials are charged with protecting public health, such evidence must be given serious consideration. At a minimum, courts must require that local officials carefully review the submitted evidence, as well as any contrary evidence submitted by the applicant. Local authorities must be required to articulate the bases for their conclusions, so that courts may reasonably review their decisions. Any other process risks endangering the lives of the public living near these facilities.

Respectfully Submitted

Dated: October 11, 2016

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CERTIFICATION OF BRIEF LENGTH

I hereby certify that this brief conforms to the requirements of Minn. R. Civ. App. P. 132.01, subds. 1 and 3, for a brief produced with a proportional font. The length of this brief is 3,851 words. This brief was prepared using Microsoft Office Word 2010.

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BRIEF OF AMICI CURiae
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TABLE OF CONTENTS

TABLE OF AUTHORITIES........................................................................ii

INTRODUCTION AND INTEREST OF THE AMICI CURIAE.................................1

ARGUMENT.................................................................................................3

I. THE MSF FEEDLOT POSES A KNOWN THREAT TO THE
ENVIRONMENT .........................................................................................3

II. THE BOARD FAILED TO TAKE THE REQUIRED HARD LOOK AT THE
ISSUES RELEVANT TO ITS MSF CUP DETERMINATION......................10

A. Approval Of The MSF CUP Failed To Satisfy The Requirements Of
   The Ordinance § 18.13.8, Endangering the Environment And The Public’s
   Welfare ..............................................................................................12

B. The Board’s Refusal To Enforce Informational Requirements Under The
   Ordinance Deprived The Public Of Its Ability To Evaluate And Challenge
   A Feedlot That Posed A Significant, Known Risk To Its Environment And
   Welfare ..............................................................................................17

III. THE BOARD IMPROPERLY SUBSTITUTED THE REQUIREMENTS OF THE
   FEEDLOT RULES FOR THE REQUIREMENTS OF THE ORDINANCE,
   UNDERMINING THE EXPRESS PURPOSE OF COUNTY AND STATE
   ZONING LAWS .................................................................................20

CONCLUSION ...........................................................................................25
# TABLE OF AUTHORITIES

<table>
<thead>
<tr>
<th>Cases</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application of Q Petroleum, 498 N.W.2d 320 (Minn. 1981)</td>
<td>10, 17, 20</td>
</tr>
<tr>
<td>Eagle Lake of Becker Lake Ass'n v. Becker Cty. Bd. of Comm'rs,</td>
<td>10</td>
</tr>
<tr>
<td>738 N.W.2d 788 (Minn. App. 2007)</td>
<td></td>
</tr>
<tr>
<td>In re Block, 727 N.W.2d 166, (Minn. App. 2007)</td>
<td>10, 12, 17, 19</td>
</tr>
<tr>
<td>Trom et al., v. County of Dodge et al.,</td>
<td>18</td>
</tr>
<tr>
<td>20-CV-14-293 (3d Jud. Dist. Ct.) (November 18, 2014)</td>
<td></td>
</tr>
</tbody>
</table>

## Statutes

<table>
<thead>
<tr>
<th>Statute</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 U.S.C. § 291</td>
<td>20</td>
</tr>
<tr>
<td>7 U.S.C. § 2131</td>
<td>20</td>
</tr>
<tr>
<td>11 U.S.C. § 303(a)</td>
<td>20</td>
</tr>
<tr>
<td>29 U.S.C. § 152(3)</td>
<td>20</td>
</tr>
<tr>
<td>29 U.S.C. § 213</td>
<td>20</td>
</tr>
<tr>
<td>33 U.S.C. § 1342</td>
<td>20</td>
</tr>
<tr>
<td>33 U.S.C. § 1362</td>
<td>20</td>
</tr>
<tr>
<td>42 U.S.C. § 7412</td>
<td>20</td>
</tr>
<tr>
<td>42 U.S.C. § 7521-7590</td>
<td>20</td>
</tr>
<tr>
<td>42 U.S.C. § 9601</td>
<td>20</td>
</tr>
<tr>
<td>42 U.S.C. § 11021(e)(5)</td>
<td>20</td>
</tr>
<tr>
<td>Minn. Stat. § 116D.04</td>
<td>20</td>
</tr>
<tr>
<td>Minn. Stat. § 116.07</td>
<td>20</td>
</tr>
<tr>
<td>Minn. Stat. § 394.21</td>
<td>13, 23</td>
</tr>
<tr>
<td>Minn. Stat. § 394.301</td>
<td>10, 12</td>
</tr>
<tr>
<td>Minn. Stat. § 561.19</td>
<td>20</td>
</tr>
</tbody>
</table>

## Rules

<table>
<thead>
<tr>
<th>Rule</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 C.F.R. 68.125</td>
<td>20</td>
</tr>
<tr>
<td>40 C.F.R. 355.40</td>
<td>20</td>
</tr>
<tr>
<td>Dodge County Zoning Ordinance, Ch. 1, 4, 16, and 18</td>
<td>passim</td>
</tr>
<tr>
<td>Minn. R. 4410.0300</td>
<td>20</td>
</tr>
<tr>
<td>Minn. R., Ch. 7020</td>
<td>passim</td>
</tr>
</tbody>
</table>
INTRODUCTION AND INTEREST OF THE AMICI CURIAE

On December 11, 2014 the Dodge County Planning Commission ("Commission") and Board of Commissioners ("Board") held specially arranged sessions to reapprove a feedlot conditional use permit ("CUP") application submitted by Masching Swine Farms, LLC ("MSF"). AR 884-971, 981-85. Concentrated animal feeding operations ("CAFOs") such as MSF pose a series of significant threats to water, air, and land. While a handful of federal and state laws regulate CAFO activity generally, county-level zoning ordinances often provide the only means to determine when a CAFO is not an appropriate operation for its proposed location. Where, as here, a Board fails to uphold its ordinance, the environmental and public health and welfare concerns protected by the ordinance are undermined.

The Minnesota Center for Environmental Advocacy ("MCEA"), Environment Minnesota, and Food & Water Watch ("FWW") (collectively "amici") are concerned that upholding the MSF feedlot CUP has implications beyond the parties to this litigation. The issues in this case concern the duties of delegated counties such as Dodge to properly exercise their permitting and regulatory authority over feedlots. In addition, issues in this case concern and will likely affect citizens' ability to meaningfully participate in the permitting and citing processes for feedlots, during which a critical and unique opportunity is guaranteed to the public both to protect one's property rights and health.

Pursuant to Minn. R. Civ. App. P. 129.03, amici hereby state that no counsel for a party authored this brief in whole or in part and no person other than the amici, their members, or their counsels made any monetary contribution to the preparation or submission of this brief.
concerns and to encourage environmental protection. Amici submit this brief in support of the Plaintiff-Appellants Lowell Trom and Evelyn Trom, respectfully requesting that this Court reverse the district court and Board and vacate the CUP granted to Defendant-Respondent MSF.

MCEA is a Minnesota non-profit organization founded in 1974 whose mission is to use law, science, and research to preserve and protect Minnesota’s natural resources, wildlife, and the health of its people. MCEA is engaged in public policy advocacy and education in five program areas, including water quality and natural resources. As part of its advocacy, MCEA has participated in administrative rulemaking proceedings (Minn. R., Ch. 7020) concerning the regulation of pollutants discharged to surface and ground waters from CAFOs. MCEA’s continued participation in such matters since 1974 is unique, and gives MCEA specific expertise and experience in the local regulation of animal feedlot operations. MCEA has a distinct interest in ensuring that local regulations properly implement state laws intended to prevent pollution of rivers, streams and lakes from animal feedlot operations. MCEA also has a distinct interest in ensuring that local regulations preserve and respect the procedural rights of itself and other citizens or organizations working to protect the natural resources of this state. MCEA has state-wide membership, and many of those members individually participate in proceedings of the sort at issue in this particular appeal.

Environment Minnesota is the state affiliate of Environment America, a 501(c)(4) organization doing business as Environment Minnesota on behalf of its thousands of supporters in the state. As part of its longstanding commitment to protect our rivers,
lakes, streams and other water resources, Environment Minnesota is deeply concerned by the water pollution impacts of industrial livestock operations, such as the MSF feedlot. Environment Minnesota has expertise particular to this case, and recently published a national report outlining the water pollution threats of industrial agribusiness operations, including animal feedlots of the type at issue in this matter.

FWW is a national, non-profit consumer advocacy organization with its headquarters in Washington, D.C. and several offices throughout the United States. FWW’s mission is to champion healthy food and clean water for all by standing up to corporations that put profits before people, and advocating for a democracy that improves people’s lives and protects our environment. FWW works to ensure safe food and clean water, advocating for safe, wholesome food produced in a humane and sustainable manner and the public, rather than private, control of water resources. FWW has more than 900,000 members and supporters in the United States. More than 28,000 of these members and supporters are Minnesota residents, and at least 30 live in Dodge County.

ARGUMENT

I. THE MSF FEEDLOT POSES A KNOWN THREAT TO THE ENVIRONMENT.

Swine CAFOs such as the MSF feedlot\(^2\) pose several significant threats to the environment and to public health, both individually and in the aggregate.\(^3\) A primary

\(^2\) Assuming the 2,400 finishing-swine legal capacity is not exceeded, the MSF feedlot meets the size threshold definition of a medium CAFO. 40 C.F.R. 122.23 (b)(6); Minn. R. 7020.0300, subp. 7d.

\(^3\) Nat. Ass’n of Local Bds. of Health, *Understanding Concentrated Animal Feeding*
threat is due to the quantity of manure they produce. One hog produces roughly ten times more fecal waste than a human. The Minnesota Pollution Control Agency ("MPCA") estimates that the amount of manure generated in Minnesota is equivalent to a human population of about 50 million. At full legal capacity, the MSF CAFO alone will produce more fecal waste than the total human population of Dodge. Pig manure contains high levels of several potential contaminants such as nitrogen, phosphorus, ammonia, nitrate, hydrogen sulfide, and methane, in addition to any pathogens, hormones, antibiotics, and chemicals used or produced at the feedlot, which pose a variety of distinct threats to water and air.

The MPCA’s water monitoring suggests that about 40 percent of Minnesota’s lakes, rivers, and streams are impaired, failing to meet one or more water quality

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4 *Id.*


7 In 2010, Minnesota’s census-reported human population was 5,303,925, of which 20,087 resided in Dodge. U.S. Census Bureau, *QuickFacts-Minnesota*, available at www.census.gov/quickfacts/table/PST04521512. Minnesota’s current hog population is an estimated 8,100,000 (accounting for 11.7% of the national inventory), with a Dodge County pig population in 2012 of 163,874. U.S. Dept. of Agriculture—National Agricultural Statistics Service, *Quick Stats*, available at quickstats.nass.usda.gov/. Pigs in Dodge are thus producing the fecal equivalent of more than 1,638,740 humans.

8 Nat. Ass’n of Local Bds. of Health, *supra* at 2; see generally, Marc Ribaudo et al., *USDA—Manure Management for Water Quality*, Agricultural Economic Report No. 824 (June 2003).
The majority of impaired waters are in the southern half of Minnesota, which has the highest number of stressors related to excess nutrients, such as nitrogen and phosphorus, excess sediment, lack of habitat and connectivity, and impaired biological communities. More than half of these southern waters fail to meet swimmable or fishable standards. Several “fish-kills” have occurred in Southeastern Minnesota: In July 2015, 10,000 fish died after heavy rains, which saw nutrient levels exceed drinking water standards by 400 percent. In 1998, a 100,000 gallon manure spill into a creek killed nearly 700,000 fish along 19 miles of stream.

Westfield-Ripley Drainage Ditch runs through the Toquam land on which MSF is located and on which MSF manure is to be applied. A few hundred feet from the CAFO the ditch turns and runs less than a mile downstream and empties into the Little Cedar River, which is an impaired water listed as “non-supporting of aquatic life for aquatic macroinvertebrate communities” due, in part, to low oxygen caused by high concentrations of nitrogen and phosphorus. The Little Cedar River, in turn, empties into

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9 MPCA, Minnesota’s Impaired Waters List, www.pca.state.mn.us/water/minnesotas-impaired-waters-list (last accessed October 9, 2016).
11 Id.
12 Id.
the impaired Cedar River, a tributary of the impaired Iowa River, and ultimately into the Mississippi River.\textsuperscript{15}

The MSF CUP application estimates that its pigs will produce 1.1 million gallons of swine manure that requires land application. AR 146. It also anticipates that its 1.1 million gallons of manure will contain 55,000 pounds of nitrogen and 48,400 pounds of phosphorus. AR 147. Nitrogen and phosphorus in manure applied to land will runoff into the watershed’s already impaired waters at varying rates depending on rain levels, soil permeability, and method of application.\textsuperscript{16} This excess nutrient runoff directly contributes to algal blooms, decreased oxygen levels, and other surface water impairments.\textsuperscript{17} Nitrogen also converts in the soil to nitrate, which is a potential drinking water contaminant that is of serious concern for infant health.\textsuperscript{18}

As early as 1992, agricultural sources discharged 4.65 million tons of nitrogen and 1.16 million tons of phosphorus into surface waters each year.\textsuperscript{19} Since 1992, agricultural waste has dramatically increased, with operations consolidating and growing at a high

\textsuperscript{15} \textit{Id.}
\textsuperscript{17} \textit{Id.}
\textsuperscript{18} \textit{Id.}
rate in the interim. In 1994, land use models indicated that agriculture was the leadingsource of nitrogen (76 percent) and phosphorus (56 percent) in the environment.

Since crop absorption rates for nitrogen and phosphorus differ, farms may apply
manure to cropland according to a nitrogen or phosphorus standard. One study
estimated that 51 percent of nitrogen in pig manure and 64 percent of its phosphorus,
applied nationally in 1997, was in excess of crop needs at the farm level. In 1998, most
farms, regardless of size, failed to meet recommended nitrogen based standards for
application of manure. Only 18 percent of large farms met recommended nitrogen
application standards. Even then, fewer farms were applying manure to meet a
phosphorus standard, because the high phosphorus content of manure relative to crop
needs significantly reduces the quantity of manure that can be applied on an acre of
land. No large farms in the Eastern Corn Belt, Mid-Atlantic, or West met a phosphorus
based standard. Slurry systems, such as MSF’s, preserve more of the nutrients in
manure than do lagoon systems, which lose a significant amount of nitrogen to the
atmosphere and phosphorus to the sludge at the lagoon bottom. As a result, more land
per animal is necessary under a slurry system than a lagoon system in order to meet either

\[\text{Curt Zimmerman, Minn. Dept. of Agriculture—2015 Livestock Industry Study}
\text{(February 1, 2016), at 3.}
\]
\[\text{James Stephen Carpenter, Farm Chemicals, Soil Erosion, and Sustainable Agriculture,}
\text{Stanford Env. L.J. 190, 201 (1994).}
\]
\[\text{Ribaudo et al., supra.}
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\[\text{Id. at 14.}
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\[\text{Id. at 17.}
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\[\text{Id. at 14.}
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\[\text{Id. at 16.}
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\[\text{Id.}
\]
\[\text{Id. at 18.}
\]
nutrient standard. When a phosphorus-based standard is required, producers require even more land for application; large farms, on average, would need to spread on over 1,000 additional acres of land to meet a phosphorus-based standard.

This water quality threat is not limited to the immediate locality. The same heavy June rains throughout the Corn Belt that initiated the 2015 Minnesota fish-kill expanded a dead-zone in the Gulf of Mexico to 6,474 square miles in which oxygen levels were too low to support fish and marine life. The National Oceanic and Atmospheric Administration stated that agricultural pollutant-nutrient runoff directly caused the growth of the dead-zone in the Gulf. MSF seems a long way from the world’s second-largest dead-zone, but the few maps submitted with the CUP application show that runoff produced by MSF manure has a direct hydrological connection to the Gulf of Mexico.

In an attempt to limit this environmental threat to surface waters, the feedlot rules require manure management plans (“MMPs”) that “help ensure that application rates do not exceed crop nutrient needs, and that setback from waters and drain tile intakes are observed.” The determination of how much of MSF’s 103,000 pounds of pollutant-nutrients will runoff into impaired surface waters is complicated and depends on weather,

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29 Id.
30 Id.
32 Id.
33 MPCA, Livestock and the environment, supra.; Minn. R. 7020.2225.
method of application, crop rotations, and expected yield.\textsuperscript{34} In light of this difficulty, the feedlot rules do not provide a specific application rate for nitrogen or phosphorus, but instead require application rates in line with current recommendations from the University of Minnesota—Extension. Minn. R. 7020.2225. The current MPCA recommendation provides a maximum recommendation of 180 pounds per acre.\textsuperscript{35} The requirements also confirm that other pollutant-nutrients often exceed crop needs when manure is applied at a nitrogen standard and that “[s]ometimes there are economic and environmental benefits of applying manure at rates lower than [nitrogen] needs.”\textsuperscript{36} Dodge’s zoning administrator, advising the Board, failed to detail the calculations behind her estimation that just 244 acres were required for the land application of the annual 1.1 million gallons of manure produced by MSF. AR 941-43. However, if manure is applied at her suggested rate, more than 225 pounds of nitrogen and 196 pounds of phosphorus would be applied to each acre, well in excess of MPCA recommended guidance that determines feedlot rule compliance.\textsuperscript{37} This suggests that land application of MSF manure is unlikely to comply with the manure management requirements of the feedlot rules. Citizens submitted detailed evidence, arbitrarily and unreasonably set-aside by the Board, that there was insufficient land to support MSF’s manure footprint and that at least 190 of the 490 acres reserved for MSF manure had been doubly-pledged, as was

\textsuperscript{34} University of Minnesota—Extension, \textit{supra}.
\textsuperscript{36} \textit{Id}.
\textsuperscript{37} Fernandez & Schmitt, \textit{supra}. 

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later verified. AR 291, 890; Appellants’ Brief at 27. The Board’s role, confirmed by the district court and contrary to the advice it received from its zoning administrator, is to satisfy the express requirements of its ordinance in order to protect environmental interests and its public’s health, welfare, and property from uses inappropriate to the proposed location. AR 323-41.

II. THE BOARD FAILED TO TAKE THE REQUIRED HARD LOOK AT THE ISSUES RELEVANT TO ITS MSF CUP DETERMINATION.

Under Minn. Stat. § 394.21, “[f]or the purpose of promoting the health, safety, morals, and general welfare of the community any county in the state having less than 300,000 population...is authorized to carry on county planning and zoning activities.” So empowered, a county board may designate by ordinance certain developments or activities as conditional uses. Minn. Stat. § 394.301. In approving a CUP, a county board’s action must accord with the requirements of its relevant planning and zoning ordinances. Eagle Lake of Becker Lake Ass’n v. Becker Cty. Bd. of Comm’rs, 738 N.W.2d 788, 797 (Minn. App. 2007). Where, as here, a county board failed to take a hard look at the relevant issues in a zoning decision, such as the granting of a CUP, the board’s decision is arbitrary and subject to reversal. In re Block, 727 N.W.2d 166, 180 (Minn. App. 2007). Further, a municipality acts consistent with Minnesota law in refusing to issue a permit based on an incomplete application. Application of Q Petroleum, 498 N.W.2d 320, 325 (Minn. 1981).

The ordinance clearly articulates its purpose in Chapter 1:

Section 1.2—Purpose
1.2.1—This Ordinance is adopted for the purpose of:

A. Protecting and promoting public health, safety, general welfare and morals of the citizens of Dodge County;

B. Protecting and preserving agricultural land, productivity of such land and animal agriculture;

C. Promoting and providing for orderly, responsible, and sustainable development of agricultural, residential, commercial, industrial, recreational, conservation and public areas and land uses;

D. Promoting compatible development and uses to prevent land use conflicts, conserve the value of properties and preserve the quality of life for the citizens of the county;

E. Promoting appropriate development and use of land located within the shoreland to preserve and enhance the quality of surface waters, conserve the economic and natural environmental values of shorelands and provide for the wise use of water and related land resources;

F. Promoting appropriate development of floodplains and limiting the development or use of land which could result in the potential for loss of life and property, create health and safety hazards, and lead to extraordinary public expenditures for flood protection and relief;

G. Protecting and preserving historical, archeological, scenic and other natural resources which are significant to Dodge County;

H. Protect groundwater water quality and quantity and quality by facilitating the adequate provision of water, sewage treatment, manure storage and application and management of all land uses within the county;

J. Protecting the environment;

L. Administering the planning and zoning activities pursuant to Minnesota Statutes 394.21, as amended.

Ordinance § 1.2. Chapter 1 further requires that “no structure shall be erected, converted, enlarged, reconstructed or altered, and no structure or land shall be used for any purpose or in any manner which is not in conformity with this ordinance.” Ordinance § 1.5.
A conditional use is defined as a “land use or development as defined by Ordinance that would be *inappropriate generally* but may be allowed with appropriate restrictions as provided by official controls upon a finding that (1) certain conditions as detailed in the Zoning Ordinance exist; (2) the use or development conforms to the comprehensive land use plan of the County; and (3) is compatible with the existing neighborhood.” Ordinance § 4.2 (emphasis added). “Conditional uses may be approved upon a showing by an applicant that standards and criteria stated in the ordinance will be satisfied. Such standards and criteria shall include both general requirements for all conditional uses and, insofar as practicable, requirements specific to each designated conditional use.” Minn. Stat. § 394.301. Chapters 16 and 18 of the ordinance, among others, provide two such sets of standards and criteria. Where, as here, a county board fails to take a hard look at whether the criteria of its ordinance are met, the decision is arbitrary and subject to reversal. *In re Block*, 727 N.W.2d, at 180.

A. Approval Of The MSF CUP Failed To Satisfy The Requirements Of Ordinance § 18.13.8, Endangering The Environment And The Public’s Welfare.

The ordinance also requires that the County exercise its authority within the limits of Chapter 18, which details the powers, duties, and limitations vested in the Commission and its advisory boards, and which lists the many requirements for conditional uses at the planning, application, vetting, permitting, and rescinding or discontinuance stages. These requirements are not displaced by the feedlot-specific requirements of Chapter 16; indeed, the “findings and recommendations” section of Chapter 18 provides eleven
additional “criteria for granting all CUPS,” which appear on both iterations of the MSF CUP application. AR 2, 122; Ordinance § 18.13.8.

The ordinance first requires that an incomplete application must be returned prior to consideration, and requires that an application will not be considered complete until the fee is submitted. Ordinance §18.13.5. The applicant must show that the use or development conforms to the comprehensive land use plan and is compatible with the existing neighborhood. Ordinance § 18.13.8 (A). The Board may then approve the conditional use, but only upon a finding that the proposed conditional use meets each of the eleven criteria. Id. The first criterion requires a Board finding that “[t]he establishment, maintenance, or operation will not be detrimental to or endanger the public health, safety, or general welfare.” Id. This language echoes the first express purpose listed by the ordinance in Chapter 1 and the express purpose of relevant state statutes, underscoring the critical duty of the County to protect its citizens from conditional uses inappropriate to the area. Ordinance §§ 1.2.1, 4.2, 18.13.1, 18.13.8; Minn. Stat. § 394.21. The fourth criterion requires a Board finding that proposed use will not “unduly restrict the enjoyment of other property in the immediate vicinity” including whether the applicant has ensured that the use will not constitute a nuisance. Ordinance § 18.13.8 (A). The fifth criterion requires a Board finding that “the proposed use shall not substantially diminish and impair property values within the area.” Id. The ninth criterion requires “[t]hat existing groundwater, surface water and air quality are or will be adequately
protected.\textsuperscript{38} \textit{Id.} Also, under the ordinance, “minutes of the County Board shall constitute written findings for its decisions.” Ordinance § 18.13.11.

Here, the MSF application fee was waived weeks after it was accepted, in violation of Ordinance § 18.13.5. AR 981. Prior to the fee waiver request and grant on December 11, 2014, the MSF application was incomplete under the ordinance and required to be returned by the zoning administrator. Ordinance § 18.13.5. The county failed to return the incomplete application, but instead (a) prepared a staff report urging approval of the MSF CUP, (b) scheduled special sessions of the Board and Commission, (c) fielded comments from relevant state and county officials otherwise required by the ordinance, (d) organized and held a Feedlot Advisory Committee (“FAC”) review on-site at MSF, and (e) prepared a Feedlot Advisory Report urging approval of the CUP. AR 199, 281, 283, 518-220, 522-24, 778-87.

While the second application was swollen with lengthy construction details pertaining to a building already constructed, it failed to convey information sufficient to support Board findings on whether the criteria of § 18.13.5 were met. AR 986-1007. The public, through extensive written and oral commentary opposing the feedlot, presented detailed evidence of known environmental, public health, and property value threats posed by the feedlot. AR 294-300, 573-667, 871-75, 888-909. These public submissions included comments on the existing oversaturation of feedlots in Dodge, the impaired

\textsuperscript{38} In 2011, the legislature amended law pertaining to surface waters, limiting MPCA’s ability to set more stringent Clean Water Act requirements than those set by federal law. Minn. Stat. § 116.07, subd. 7(c). Despite this limitation, legislature left standing the right for counties to adopt and enforce zoning ordinances or plans, even resulting in more strict standards than under the feedlot rules. Minn. R. 7020.0200.
nature of local surface waters into which MSF manure would runoff, the known, ongoing violations of feedlots in the vicinity, and the distinct threat to nearby property values, amongst other concerns. Id.

Having received this public commentary, the Commission and Board closed their public hearings and assessed the application, relying almost exclusively on the opinion of the county’s zoning administrator, Melissa DeVetter. AR 875-82, 922-67, 984. She opined that the ordinance’s many express requirements under Chapter 18 might be assumed satisfied because compliance with the feedlot rules would later be required of the feedlot. 39 AR 938. When questioned by the Commission, with the Board present, about sufficiency of the MMP and the acreage required to support MSF, DeVetter

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39 DeVetter stated to the Board, with respect to the first criteria of § 18.13.8: “The first is to establish the maintenance and operation will be detrimental or endanger public health, safety, and welfare. Again, [MSF is] designed to be a zero discharge facility if it’s—if—I’m not sure, this is—what it was trying to relay previously was that this program is so highly regulated by both the county and the state that everything—everything from the engineered plans to how they keep their records has to be in a way that’s defined by the state.” AR 938. With respect to whether MSF’s proposed use was appropriate to its location, DeVetter provided that “the area is zoned agriculture. Conditional—I mean, feedlots, and this could be any kind of feedlot, it could be anything from a small, you know, a couple horses on a lot up to, you know, up to 3,000 animal units, because that’s where half is of, you know, dairy, hogs, beef. It—it is an appropriate use in the agricultural district, and so I’m not sure—I—I’m not sure where else you would put these facilities. If that’s not an appropriate use out in the agricultural district we’re not exactly sure where you would put them.” AR 938-39. Finally, regarding her assessment of MSF’s compatibility and potential to diminish or impair property values, she stated that “the real issue I think here appears to be compatibility with the one adjacent land unit—land owner. Again, this indicates that we have one person that is within, you know, 3,845. As you are aware, they are very opposed to the project, but I’m—I cannot—they have expressed that they would be injured by this. It is our opinion that it—it meets all the ordinance requirements so. We talked about substantially diminishing and impairing property values within the area, we have records that the property wouldn’t be devalued on that.” AR 939
advised that the MPCA feedlot rules concerning manure management would require just 244 acres for application of the annual 1.1 million gallons of MSF manure. AR 941-43. DeVetter arrived at this figure with the assistance of “Paul Brietzke, Minnesota Pollution Control Agency . . . not speaking on behalf of the Pollution Control Agency.” AR 943. A Commissioner then asked DeVetter to clarify that MPCA takes “precedence over anything we would even do anyway, right, the state?” DeVetter responded that the MPCA “regulates air quality. They regulate surface water quality, so they have the standards.” AR 943. The Commissioner stated, “That we use?” to which DeVetter replied, “Correct.” AR 943-44. This interpretation, that the county’s oversight can be substituted with that of the state, evinces a fundamental misunderstanding of CAFO regulation and delegation under state law.

The Board then granted the MSF CUP, finding that “the application and materials submitted by the applicant provide the County Board with all of the information required by the Ordinance and further, provide the County Board with sufficient information to fully evaluate the proposal under the criteria set forth in the County’s Ordinance.” AR 983. “The County Board has considered [] the objections and materials submitted by the project opponents, and rejects their conclusion. The County Board specifically credits the information provided by [DeVetter], who refuted all of their objections.” AR 984.

The Board’s finding that DeVetter refuted all objections presented against the feedlot is incorrect. The Board did not consider evidence of doubly-pledged land, did not consider or weigh evidence of known local impaired surface waters, did not consider evidence of improper application techniques, did not consider the likelihood of nuisance
conditions arising from the feedlot, did not consider the likelihood of surface water pollution from antibiotic use, and, critically, did not consider either the existing oversaturation of the immediate area and county or the cumulative impact of existing feedlots.\textsuperscript{40} See AR 779-84, 785-87, 884-971, 986-1007. The Board thus failed to satisfy the requirements of § 18.13.8 (A) with respect, at least, to the first, fourth, fifth, and ninth criteria, instead arbitrarily and capriciously relying on the incomplete and erroneous interpretation of the ordinance and the potential impact of MSF presented by the zoning administrator—against the weight of public showings of known threats to the environment, public’s health, safety, and general welfare. Under \textit{In re Block} and Application of Q Petroleum, this court should reverse the determination of the Board and vacate the MSF CUP.

B. \textbf{The Board’s Refusal To Enforce Informational Requirements Under The Ordinance Deprived The Public Of Its Ability To Evaluate And Challenge A Feedlot That Posed A Significant, Known Risk To Its Environment And Welfare.}

Due to the failure of MSF to submit a completed feedlot CUP application, the public and Board did not have the requisite information to assess the conditional use with respect to the express purpose of its ordinance, which protects environmental and public health and welfare considerations. Chapter 16 sets standards for specific uses and structures, which are the “minimum requirements for the use or structure and are in addition to any other requirement of this Ordinance . . . [a]ll uses . . . whether Permitted,

\textsuperscript{40} Regardless of whether cumulative impacts are relevant to feedlot rule considerations, they are imperative for the determination of whether a conditional use is appropriate where proposed.
Interim, or Conditional shall comply with all applicable Federal, State and County laws, rules and regulations . . .” Ordinance §§ 16.1, 16.2.1. Chapter 16 also lists feedlot specific permitting criteria delineating feedlot CUP standards, siting requirements, manure management planning, and compliance certifications. Ordinance § 16.24.

Section 16.24.3 of the ordinance, since amended, provided informational requirements for a feedlot CUP application. These informational requirements, also detailed on the County’s CUP application itself as of the February 10, 2014 first MSF application (AR 2), were found lacking by the district court, a decision that was not appealed. Trom et al., v. County of Dodge et al., 20-CV-14-293 (3d Jud. Dist. Ct.) (November 18, 2014) (provided at AR 323-41). MSF submitted a second application, dated two days after the court’s reversal order, on a form recently updated by the County. AR 122-24. The feedlot section of the ordinance had not been amended in the interim. Yet where the earlier CUP form had provided spaces for applicants to fill in the “[a]dditional information requirements,” of § 16.42.3 (AR 2), the new form removed spaces for the required information, merely listing the requirements of § 16.24.3 as post hoc conditions of a CUP grant: “Upon approval of the [CUP] for the feedlot additional information is required.” AR 123. This update may have reflected a Board intention to no longer hold feedlot applicants to the informational requirements of § 16.24.3, which it has

41 In February 2015, the Board amended the § 16.24.3 feedlot CUP informational requirements as advised by its zoning administrator and county attorney, replacing thirteen informational requirements with the sole requirement that “[a]n application for a CUP shall be submitted on forms provided by the County.” Dodge County, Planning Minutes (February 4, 2015), available at www.co.dodge.mn.us/EnvironmentalServices/2_4_2015_Planning_minutes.pdf
since amended; but at the time of the second MSF CUP approval, the detailed informational requirements were intact and required strict compliance in order to support valid Board approval of a feedlot CUP. See Ordinance § 16.2.1.

MSF’s second application on the updated form was more expansive, but still failed to meet the requirements of Chapter 16. AR 122-96. First, the MMP remained inadequate, failing to describe how 1,100,000 million gallons of MSF manure could legally be spread on the pledged land. AR 146-47. Second, the aerial photos, required under § 16.24.3 (F) (I), do not provide enough information for the Board to properly determine that the land is available and sufficient. AR 140-45. Third, the application does not provide information of a “pollution abatement structure.” AR 92.

Despite extensive public commentary on the issues of insufficient acreage for application and of doubly pledged land, the Board refused to take the required hard look at whether enough land was available to support the manure footprint of the MSF feedlot. See AR 779-84, 785-87, 884-971, 986-1007. Instead, the Board took the same approach as when it approved the first MSF CUP, assuming the feedlot was an appropriate use because it would later be subject to feedlot rules once in operation. AR 938-39. However, as stressed by the district court vacating the first MSF CUP, the mere possibility, or even likelihood, of subsequent and alternative regulatory compliance does not relieve the Board of its duty to uphold its ordinance. AR 330.

Because the MSF application was incomplete, failing in part to meet the clear requirements of § 16.24.3, the conditional use did not comply with applicable county and state laws, as required by § 16.2.1. The Board thus did not, and could not, take the
hard look required under *In re Block*. This court should vacate the CUP, as the determination was based on an incomplete application. *Application of Q Petroleum*, 498 N.W.2d at 325.

III. THE BOARD IMPROPERLY SUBSTITUTED THE REQUIREMENTS OF THE FEEDLOT RULES FOR THE REQUIREMENTS OF THE ORDINANCE, UNDERMINING THE EXPRESS PURPOSE OF COUNTY AND STATE ZONING LAWS.

Most regulated sectors are subject to various labor, anti-trust, animal welfare, and environmental laws, but agricultural producers enjoy a unique level of freedom from regulation. *See e.g.*, 7 U.S.C. §§ 291, 2131; 11 U.S.C. §303(a); 29 U.S.C. §§ 152(3), 213; 33 U.S.C. § 1362; 42 U.S.C. §§ 7412, 7521-7590, 9601; 42 U.S.C. § 11021(e)(5); 40 C.F.R. 68.125, 355.40(2); Minn. Stat. § 116.0713; Minn. Stat. § 116D.04, subd. 2a (d); Minn. Stat. § 561.19; Minn. R. 4410. 0300, subp. 3; Minn. R. 7020.2002. Authority over the few remaining environmental regulations from which CAFOs have not been exempted has been largely delegated from federal to state agencies. *See, e.g.*, 33 U.S.C. § 1342. In Minnesota, where the bulk of feedlot regulation is codified in the feedlot rules, the MPCA may further delegate responsibility to the county level, as it has in Dodge. Minn. Stat. § 116.07, subd. 7; Minn. R. § 7020.1500. Under this delegation program, in which “most of the state’s major feedlot areas participate,” counties must designate a County Feedlot Officer (“CFO”), who is charged with monitoring and enforcing the feedlot rules. 42 Minn. R. 7020.1600, subp. 3a (D).

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In Dodge, the CFO is a member of the Environmental Services staff, which also includes the zoning administrator, DeVetter. Before his 2011 retirement, Ken Folie was Dodge’s CFO; he does not sit on the FAC, but attended both FAC visits to the MSF feedlot and spoke in support of CUP approval at the second public hearing, claiming an individual interest. AR 911. Ryan Thesing was Dodge’s CFO until the special session approval of the second MSF CUP session, at which his departure was approved. AR 681, 699, 976. Chad Knudson was later introduced as the new CFO.

Nowhere in the administrative record is DeVetter listed as Dodge’s CFO, yet she is held out as the CFO to the state and public across various media: She appears as the contact person on Dodge’s 2011, 2012, 2014, and 2015 MPCA Annual CFO and Performance Credit Reports required of a county CFO under Minn. R. § 7020.1600. DeVetter is listed online as the “County Agricultural Inspector & Designated Employee.” She is also listed as Dodge’s primary contact and CFO on the current MPCA delegated county list, with actual CFO Knudson included as an assistant.

DeVetter was also involved in Planning Commission appointment decisions, recommending soon after the Board’s approval of the first MSF CUP that Commissioner

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43 Dodge County, Environmental Services, www.co.dodge.mn.us/departments/environmental_services/index.php (last accessed October 9, 2016).
44 Dodge County, Board Minutes (January 27, 2015), available at www.co.dodge.mn.us/County_Board/2015_Board_Minutes/01_27_15.pdf.
46 Minn. Dept. of Agriculture, County Agricultural Inspectors & Designated Employees, available at www.mda.state.mn.us/plants/pestmanagement/weedcontrol/cailist.aspx (last accessed October 9, 2016).
Jessica Masching be replaced with Joshua Toquam. DeVetter also participated in closed sessions with the Board and the county’s attorney, one week after the district court’s reversal of the Board’s decision and five days after MSF submitted a second CUP application to DeVetter, in order to “discuss options and receive direction from the Board” regarding the MSF CUP. AR 122, 205, 348, 788. DeVetter featured heavily in the each of the County’s MSF CUP determinations, advocating for the CAFO and providing her interpretation of the purpose and requirements of the feedlot rules, the ordinance, and the district court’s order to vacate the first CUP. AR 28-29, 117-19, 673-80, 875-82, 922-46, 952-54, 963-67, 981-85.

In a sworn affidavit, DeVetter stated that she was initially hired as a compliance officer, “responsible for inspecting zoning permits, processing violations, ... evaluating compliance with CUP conditions, and performing compliance inspections on feedlots under [the feedlot rules].” AR 668-69. She also swore that the CUP “application and ordinance do not indicate that all of the information [required by the ordinance] has to be submitted up front as part of the application, but is satisfied with conditions placed upon the CUP and the numerous requirements of the county delegated feedlot program and [the feedlot rules.]” Id. This interpretation, which played a critical role in the reasoning of the Board (see AR 943-44), is inaccurate; the informational requirements for a feedlot CUP are clear and unambiguously enumerated in Chapters 16 and 18 of the ordinance.

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and informed by the clear purpose in Chapter 1. Such requirements are not duplicative of those controlled by the feedlot rules, but are distinct requirements that exist for the express purpose of protecting public health and environmental considerations, as provided by the ordinance and state law. Ordinance §§ 1.2.1, 4.2, 18.13.1, and 18.13.8; Minn. Stat. § 394.21.

Fulfilling dual-functions of zoning administrator and acting-CFO, DeVetter encouraged the county to take a mistaken view of the interplay between the requirements of the ordinance and the feedlot rules. AR 943-44. Minnesota’s feedlot rules exist so that the state can satisfy its duty as a state delegated Clean Water Act authority and to protect, if minimally, environmental and human health concerns related to water and air quality threats posed by CAFOs. Minn. R. 7020.2000, 7020.2002. While permits or certificates may be required of a facility under the feedlot rules, these rules are distinct from zoning regulations and do not directly or sufficiently protect the interest of the neighboring citizens from the impact to their health, environment, and enjoyment of property, as does Dodge’s ordinance. Ordinance §§ 1.2.1, 4.2, 18.13.1, and 18.13.8; Minn. Stat. § 394.21.

The district court order denying the first MSP application identified DeVetter and the Board’s misstep: the county “argues that all the information required by § 16.23.4 will eventually be submitted to the County as Mr. Masching continues the process of approval for his feedlot. For instance, . . . it must comply with [the feedlot rules]. Dodge County argues that, by conditioning Mr. Masching’s CUP on complying with state and local law, it has sufficiently addressed the feedlot CUP requirements of § 16.24.3. This argument is unconvincing. Indeed, the fact that the County found it necessary to
condition the CUP on Mr. Masching’s later completion of certain requirements shows clearly that the County did not have any facts regarding these requirements.” AR 338.

In this context, it is especially troubling that the Environmental Services office, to which the CFO—whether DeVetter or Knudson—belongs, publically acknowledges its awareness of multiple violations of the feedlot rules against which it has not acted. The same office—perhaps the very individual—that is charged with and knowingly fails to enforce the feedlot rules also holds a key advisory position with respect to the Board’s zoning decisions under the ordinance.

The unambiguous purpose of the ordinance focuses heavily on environmental, public health, and protection of citizens’ property rights. Ordinance § 1.2.1. Yet such concerns were effectively stripped from the Board’s determination process, when it failed to evaluate the evidence before it that the MSF feedlot was incomplete and failed to satisfy multiple requirements of the relevant ordinance. Despite the clear purpose and requirements of the ordinance under Chapters 1, 16, and 18, the Board inquired only whether the feedlot would later be required to comply with the feedlot rules. AR 984. Advised by DeVetter that the state has precedence over any of the Board’s determinations and that MSF would later face state feedlot regulation, the Board refused to otherwise consider the known likelihood of environmental and public health threats.

50 “This year we received over 30 calls related to [air quality exemptions for] manure applications. . . . The County knows the number of applications is much greater. It is required by MN Rule 7020.2002 to call in for an air quality exemption before manure application occurs. This call gives the applicator legal coverage related to any odor nuisance complaints that may filed [sic]. Dodge County, Feedlot Flyer (December 2015), available at www.co.dodge.mn.us/EnvironmentalServices/Feedlot%20newsletter%202012072015.pdf.
extensively documented by the public. AR 938-39, 943-44, 984. Ordinance requirements, not the feedlot rules, are due the hard look of the Board, which it failed to give in granting the second MSF CUP.

**CONCLUSION**

Failure by the Board to take a hard look at the requisite criteria of the ordinance is grounds for reversal by this court. The Board failed to meet its duty under, at least, Chapters 16 and 18, failing the purpose of the ordinance expressly provided in Chapter 1. As such, and because the feedlot application proposes an inappropriate use in an unsuitable area, which poses a distinct threat and non-speculative detriment to the environment, public health, safety, welfare, and property interests, this court should reverse the Board and district court, vacating the MSF CUP.

Dated: October 10, 2014

By: /s/ Kevin P. Lee

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CERTIFICATION OF BRIEF LENGTH

I hereby certify that this brief conforms to the form requirements and length limits of Minn. R. Civ. App. P. 132.01, subds. 1 and 3, for a brief produced with a proportional font. The brief was prepared using Microsoft Word 2007, which reports that the brief contains 6,832 words.

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Attorney for Amici Curiae Minnesota Center for Environmental Advocacy,
Environment America d/b/a Environment Minnesota, and Food & Water Watch
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

The EAW indicates that this factory farm expansion will generate 46 million gallons of liquid manure annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order the completion of an Environmental Impact Statement (EIS).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact
on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County’s ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

DeeAnn Stenlund
2687 Matilda St.
Roseville, MN 55113
To MPCA,

On behalf of Dodge County Concerned Citizens, I encourage you to request an EIS relating to the Daley Farms expansion. Please put the people of Winona County above the interests of the industry.

My husband and I both grew up in Dodge County, Minnesota.

I grew up on the Trom family farm in Westfield Township, Dodge County. Our family farm is surrounded by 11, and soon a 12th, swine factory farm in a 3-mile radius. Our family farm is located in the headwaters of the Cedar River which flows south to Austin, Minnesota, which, as you know, serves as the world headquarters of Hormel Corporation. Last summer, our group, Dodge County Concerned Citizens, worked with the Izaak Walton League to collect water samples in the Cedar River. Of the 500 water samples, 70% tested high for E. coli, many of which were 20 to 30 times state standards. Please, take action to defend the public health of local citizens.

My husband grew up in the northern part of Dodge County near Berne, Minnesota. Several years ago, a neighborhood citizens group fought installation of a swine factory farm, similar to the one proposed in Fillmore County. This area of Dodge County, like Winona County, is known for its karst topography. Following installation of this swine factory farm, the nitrate levels significantly increased. We test the nitrate levels in the spring and again in the fall. This spring, the nitrate reading was 26.6 mg/l (milligrams per liter), far in excess of the maximum nitrate level of 10 mg/l. We have not been able to drink water at the Eayrs farm for years and must take bottled water to the farm.

Winona County and this beautiful part of the State of Minnesota must be preserved for future generations.

We’re counting on your assistance to help preserve the beauty of southeastern Minnesota.

Thank you for taking a bold step and making a difference!

Sonja Trom Eayrs
612 743 1312
Sonja.eayrs@gmail.com
On behalf of Dodge County Concerned Citizens
www.dodgecc.org
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. The physical factors of this expansion worry me. Please order the completion of an EIS.

The proposed lagoon of this dairy operation may not be able to handle the fierce rains we have been experiencing lately in Minnesota. The MPCA should seriously consider that potential threat of the plant's incapacity in regard to frequent, heavy, downpouring rainfall.

Sincerely,

Diane J. Peterson
4051 Gisella Boulevard
White Bear Lake, MN 55110
Dear MPCA,

I am writing as a citizen and rural resident of Fillmore county to request that the Daley dairy expansion proposal not be permitted without an Environmental Impact Statement to assure the public the proposal is safe and healthful to the surrounding people and environment. Our rural areas don’t need more pollution from industrial agriculture. The MPCA needs to do its job and investigate proposals such as this one that are located in the fragile and vulnerable karst region of our state. Please require EIS for the Daley Farms proposal. Thank you for working to protect our health and safety.

Jake

Jake Stacken
Fillmore County Resident
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Sincerely,

Anna Racer
4800 Dent ave
Webster, MN 55088
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This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

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Sincerely,

Peggy Endres
943 Wilder St E
Saint Paul, MN 55116
Dear Ms. Kim Grosenheider:

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Sincerely,

Henry Homburger
2950 Fox Valley Drive Sw
Rochester, MN 55902
Dear Ms. Kim Grosenheider:

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Actually, no matter the terrain or geology, this proposal is beyond the scope of what is healthy for our planet.

Please protect our air, water, soil, and climate.

Sincerely,

Donna Martinson
90 E Spors St
Le Center, MN 56057
We need an Environmental Impact Statement on Daley Farms LLP’s dairy expansion proposal. Please don't let corpse railroad us.

Thank you
Kally Goschke.

As interpreted by Siri
Dear Ms. Kim Grosenheider:

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Sincerely,

Joline Gitis
1517 E River Pkwy
Minneapolis, MN 55414
Dear Kim --

We need an Environmental Impact Statement on Daley Farms LLP’s dairy expansion proposal.

This factory farm has the “potential for significant environmental impacts” and needs an Environmental Impact Statement. It would double the liquid manure and waste water production of this operation to 46 million gallons a year, and require adding a manure basin the size of three football fields at a depth of 16 feet. All this liquid waste would sit right over sensitive karst geology, which is composed of porous limestone that is highly prone to sinkholes and disappearing springs. This geology can allow surface pollution to enter the groundwater in a matter of hours.

I am of the understanding that open basins or “lagoons” are significant emitters of methane, which is up to 90 times as potent a greenhouse gas as is CO2. This is not the time for us to allow further upsets to an already unstable climate.

Corporate agriculture must not be allowed to further destroy our environment. I demand that an Environmental Impact Statement be prepared on the Daley Farms mega-dairy.

Stan Sattinger

3933 12th Ave. S.

Minneapolis, MN 55407
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

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This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

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Sincerely,

Gretchen Bratvold
3444 Edmund Blvd
Minneapolis, MN 55406
Dear Friend,

The politics of corporate bullying is at play again. The era of unlimited natural resources is a myth that has to end. The concept that high levels of ground pollution can be ignored is a myth. The awareness that water is the resource that gives life means we must all wake up and be stewards of the land and water.

The truth is the world can live with less dairy products but we can't live without water.

Take the time to give a real assessment to this project.

You know if they thought they were doing the right thing they could wait for the assessment to be done.

Be strong..

Nancy Palmer
I am requesting that you please require an Environmental impact statement on Daley Farm in Winona County.

Thank you
An EIS needs to be done on this operation. They want to have too many cows using too much water and creating too much manure!!! Clearly this dairy operation needs a full EIS especially since this is in a karst area. Do what's right for the people and the environment! Karen Swanson Lanesboro MN

Sent from my iPad
Daley Farms of Lewiston, LLP in Winona County wants to increase its current operation by almost 3,000 cattle for a total herd size of 4,628. This would make Daley Farms one of the largest dairy operations in the state. Over 96 percent of dairy farms in Minnesota are 500 cows or fewer.

This proposed expansion would double the liquid manure and waste water production of this operation to 46 million gallons a year, and require adding a manure basin the size of three football fields at a depth of 16 feet. All this liquid waste would sit right over sensitive karst geology, which is composed of porous limestone that is highly prone to sinkholes and disappearing springs. This geology can allow surface pollution to enter the groundwater in a matter of hours.

This dairy expansion would use 92 million gallons of the area’s groundwater annually. The nearby city of Lewiston (pop. 1,506) uses 33.6 million gallons a year. And the operation is surrounded by towns plagued with nitrate levels nearing or above the maximum allowable nitrate level of 10 mg/L.

I live in rural Winona County and I and my family will personally suffer from the (almost inevitable) groundwater pollution caused by this size operation in karst country. I implore your agency to "protect and improve the environment and human health" of the residents of our region and require an Environmental Impact Statement for this project.

Thank you,

Theresa Zeman
Zephyr Valley Lane
Rushford, MN
507.330.2151 mobile
Dear Ms. Grosenheider:

I am submitting comments to the EAW on the Daley Farms of Lewiston, LLP dairy expansion proposal near Lewiston, Winona County. According to the EAW, this factory farm expansion will generate 46 million gallons of liquid manure annually. It will also use 92 million gallons of groundwater annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order an Environmental Impact Statement.

This factory dairy operation, with its multi-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in April 1976, Lewiston in 1991, and Bellechester in April 1992.

The MPCA must analyze what the impact of a catastrophic failure of this multi-million-gallon manure pit would be, and that requires an EIS. The DNR, in its analysis for an initial permit for drilling of an additional well for this expansion stated that "the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If such negative impacts happen for lakes, streams and wetlands, how would that damage be undone and how much time might restoration take if at all possible?

This project would annually use 92 million gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. What will be the impact on our aquifer of this major annual use of water? The 3 actions that can lead to sink hole development in karst country are, moving earth (digging, displacement), pumping water and storing water. All three actions would be involved if the proposed 400’ X 400’ X 16’ manure pit were to be constructed. Since ground water is present at averages between 16 and 20 feet only in the area where manure storage is planned, how will ground water be protected? How will fissures and geologic collapse be avoided?

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from surface water deep into the ground.

Well testing conducted by the Minnesota Department of Agriculture in 2016 showed that "46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates."

Climate change is being felt in southern Minnesota in many ways, one of which is increased rainfall and increased instances of large rainfall events (there have been 3 mega storms with rainfall totals over 9 inches in 24 to 36 hour periods since 2004 in southern Minnesota alone. [https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html](https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html)

Pg. 23: Since there is no rating for determining a sensitivity of the water table because of the surface karst feature development, how can the MPCA accept only this EAW in determining possible ill-effects of this expansion? Th EAW does not address the potential negative economic impacts for neighboring farms and especially small and mid-sized dairy farmers.

Sincerely,

Sincerely,

Victoria Jaskierski
1517 River Dr S
Wabasha, MN 55981-1766
Dear Ms. Kim Grosenheider:

As an avid trout fisherman this project frightens me a great deal. There was a total fish kill on the South Branch of the Whitewater River a few years ago, caused by AG spills. This project is an environmental train wreck in the making. Besides pollution will the ground water be affected? Please give it a full environmental review.

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

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Sincerely,

Dean Flugstad
72243 300 th Ave
Lake City, MN 55041-3370
Please do whatever you can to see that the revised deadline to comment on the Daley dairy expansion request is not shortened. It is of serious import and its extremely sensitive environmental impact must be thoughtfully examined.

Mary Jo Bibby
Alexandria, MN
Dear Ms. Kim Grosenheider:

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Sincerely,

Catherine steffens
1745 Graham Ave #134
St. Paul, MN 55116
Dear Ms. Kim Grosenheider:

My name is Dale Hadler, I live in Winona County and I am submitting comments regarding the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

The EAW indicates that this factory farm expansion will generate 46 million gallons of liquid manure annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order the completion of an Environmental Impact Statement (EIS).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

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Sincerely,

Dale Hadler
1723 West 6th Street Apt.C
Winona, MN 55987
Kim,

This was sent to the agencies general email inbox. Forwarding to you.

Michelle Ooley
Administrative Assistant Principal, Legal Services Unit & Operations Division
Minnesota Pollution Control Agency (MPCA)
520 Lafayette Rd North | St. Paul, MN | 55155
651-757-2666
Michelle.ooley@state.mn.us | www.pca.state.mn.us

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From: Richard Dahl <richard.dahl580@gmail.com>
Sent: Wednesday, October 31, 2018 8:48 AM
To: MN_MPCA_General-Info <Info.PCA@state.mn.us>
Subject: Tis for Daley Farm Proposal

October 24, 2018

Kim Grosenheider
MPCA
520 Lafayette Road N
St. Paul, MN 55155-4194

Re: Comment on EAW and Permit

Dear Kim Grosenheider,
I attended the EAW in Lewiston on October 16. Mr. Gernes, an expert on the Permit who provided input on the EAW, said that if rules were not followed after the Dailey proposal was implemented, fines would be levied.

I do not think that either the threat of fines nor their implementation after an environmental disaster constitute adequate compensation for a disaster that might have been averted by a more in depth study before authorization for expansion is given.

The Daley farm is already in non-compliance in reference to nitrate levels in some wells.

I consider it criminal negligence to allow a four-fold increase in AUs from the limit set by Winona County Ordinance without first having an EIS.

For the sake of the environment, the people living in proximity to the Daley farm, and all the people of Winona County, I ask and even implore the MPCA to implement an EIS before any authorization is given to implement the Daley proposal.

Thank you the excellent meeting you held in Lewiston about the EAW and for your consideration of what I have stated in this letter.

Sincerely,

Richard K. Dahl
1167 W. 5th Street
Winona, MN 55987
Dear Ms. Kim Grosenheider:

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Sincerely,

Tiffany Reinitz
314 N 6th St
Henderson, MN 56044
Dear Ms. Kim Grosenheider:

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Sincerely,

Carol Ashley
24639 County 25
Akeley, MN 56433
Kim,
I'm very concerned about the damage Daley Farms expansion would do to the area’s aquifers. 70% of all drinking water in Minnesota comes from groundwater seeping through the karst.

Sent from my iPad
The proposed expansion of the Daley farm by Lewiston should NOT happen. It will deplete the water supply of the town, and likely pollute the rest by nitrogen going into ground water. Not mention the methane produced by that many cattle. There must be at least an EIS, but preferably denial of the request.

We cannot let corporate profit and greed destroy the environment, which is irreplaceable. They have already crossed the legal limit. The proposed expansion would use roughly 92 million gallons of ground water. Lewiston use only 33.6 million. Water is the most precious substance on our planet. We must protect it.

Frank Bures, M.D.
224 Lake Park Dr.
Winona, MN 55987
507-452-2505
I am contacting you to urge you and the agency to support the demands for an EIS on this project. I think our state rarely sees a proposed project that cries out for environmental examination and protection more than this one. Don Walser, Hutchinson MN

Sent from Mail for Windows 10
Dear Ms Grosenheider,

I have a regenerative farm where we raise pasture-fed meats - beees, hogs, goats, lambs, chickens and rabbits on 43 bluff acres just south of Red Wing - www.earthwisdomfarm.com.

I am writing to you request the appropriate level of study and care be taken regarding the massive environmental impact and utilization of natural resources the proposed 4000+ cow dairy would have on its neighbors in Winona county. For something of this scale, in this fragile geology, a paper review is completely inadequate.

I am sure you have mega-gigabytes of satellite data and historical data which will make you feel like you have everything you need. But I can assure you an on-the-ground real-time examination by real and knowledgeable people will bring you important localized information which you did not have prior.

For the sake our very blessed State of abundant land and water, please make sure a full scale environmental impact study is done before this proposed dairy is given the green light to expand.

Thank you for your work!
RedHeart RedHeart
28419 Circle S Road
Red Wing, MN 55066
952-250-8299
--

“Nothing about us without us is for us.”     HAZEL EDWARDS   teenage transgender educator
I live a mile from one the Daley farms that is used to dispose the manure from there herd. My well water is already over acceptable drinkable limits. This farm very seldom receives there manure as it is a long haul so is much easier to over apply on close fields, nobody really checks application rates. This farm is adjacent to an abandoned quarry giving runoff a direct path to my drinking water. Expansion will add more manure to this farm. Has the impact of using so much water in that large a operation looked. Can our aqueduct continue to supply other wells?

Can our engineers design a containment of that large amount of manure without it leaking in the future? Past experience say’s no. Both city’s of Lewiston and Utica have had breaches of there sewer systems. The Daley Farms have also had problems with leaks. Please check into things in depth and have a EIS done.

Stan Smith
Lewiston,Mn
Dear Ms. Kim Grosenheider:

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Sincerely,

ML Wilm
2919 45th Ave. S,
Mpls, MN 55406
To: Kim Grosenheider and MPCA officials

From: Jennifer Rupprecht  Lewiston, MN

RE: comments on EAW and Proposed Daley Dairy Farm Expansion

I farm with my husband on a 275 acre certified organic pastured-beef and crop farm located two miles from the Daley dairy farm. The Daley’s proposed expansion certainly has potential for significant environmental impacts and should definitely require an Environmental Impact Statement.

My concerns are as follows:

This expansion proposal clearly violates the current Winona County ordinance regarding animal numbers. Winona County's ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The county ordinance also states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity." Even though the Daley farm was over the 1,500 animal unit cap at the time the ordinance was enacted, I don’t feel this should give license for such enormous expansion. I am very concerned about the potential negative environmental impact of the high concentration of livestock which this proposal seeks.

If allowed to proceed, I believe the excessive volume of manure and excessive water usage by an expanded Daley farm have potential to harm the water supply for the community of Lewiston and surrounding area. Lewiston has already dealt with a sinkhole problem and the area has seen devastating erosion and flooding during extreme rain events. An EIS must be done to determine the effect of failure of the proposed 13.6 million gallon manure pit. Further, I question how one farming operation should have the right to use nearly three times the water annually that is used by the nearby town. To date, our farm well has provided sufficient water and tests (barely) in the safe-for-drinking zone. I am concerned that this may change drastically if the proposal is allowed to proceed. An EIS must be done to determine the effect on the aquifer of the proposed use of 92 million gallons of water annually.

Thank you,
Jennifer Rupprecht
Lewiston
Dear Kim Grosenheider,

My name is Mike Rupprecht and I am a farmer from Lewiston, MN. Our farm is about 2 miles from the proposed expansion of the Daley farm dairy operation. I have some environmental concerns with this proposed expansion.

1. The amount of liquid manure that would be stored is too much for this area of SE Minnesota and our karst geology. Common sense tells us the risk from a potential leak or spill is too great.

2. The volume of water to be drawn from our aquifer is too much. I’m concerned that neighboring wells (including my own) may run dry and need to be redrilled.

I ask that this proposal be subject to a full EIS.

Thank you,
Mike Rupprecht
The magnitude of Daley Farm's expansion poses threats to the health of both livestock and humans; particularly, with respect to the management of animal crowding and waste production. Please require a formal environmental impact statement (EIS).

Yours truly,
Roy House, retired pediatrician
Rochester, MN

Sent from my iPhone
Ms. Grosenheider:

The proposed expansion of the mega dairy Hansen Farms should not be even considered without a full Environmental Impact Statement. The strong opposition to such an investigation by proponents of mega dairies is not unexpected since close analysis of the huge amount of fresh water a 4,628 cow dairy will use and the likely groundwater contamination that will occur from dairy cow waste will show the danger that such mega dairies, which are really mega factories, pose.

No other kind of factory would be allowed to start construction in that location without very careful inspection of its Impacts. Powerful organizations promoting huge milk factories, even those proposed by an extended family, should not be allowed to bully the Environmental Protection Agency into neglecting public health protection.

Good water quality is often not appreciated until it is destroyed. The karst geology in Winona County almost guarantees contamination of ground water at some future date from this dairy factory.

Drinking water is too precious to give away for expanding a dairy business. Milk is not a rare commodity. In fact there is such an excess of milk that prices are historically very low. Good water is the rare commodity that should be protected.

A full Environmental Impact Statement on the Daley Farms expansion should be prepared and citizens should have extended opportunity to learn about the impacts of such mega dairies on water supply and water quality.

Sincerely,

Dana Jackson
814 Everett St. N.
Stillwater, MN 55082
651-823-8838
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows.

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Sincerely,

Robert Munneke
PO Box 197
Aitkin, MN 56431
Hello. I am reaching out to let you know I want a full environmental impact study completed on the proposed expansion of the herd size at Daley farms. Please do not allow big money Ag to slam this through. Thank you. Julie Gordon, Rochester, MN, 55901. 507 244 0359.
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

The EAW indicates that this factory farm expansion will generate 46 million gallons of liquid manure annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order the completion of an Environmental Impact Statement (EIS).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/township/testing). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

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The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact
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Sincerely,

Megan Falvey
4115 310th Ave
Clarkfield, MN 56223
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Sincerely,

Karen L. Dingle
3938 Cannonball Lake Road
Duluth, MN 55803
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Sincerely,

John Fisher-Merritt
2614 County Road 1
Wrenshall, MN 55797-8718
Dear Kim Grosenheider,

As a resident of rural Winona County, I applaud the MPCA’s extension of the comment period on the proposed Daley Farms LLP expansion in Winona County, and I strongly urge that an Environmental Impact Statement (EIS) be carried out. As you are no doubt well informed about the porous karst geology in our driftless area, and with the already fragile state of our water quality related to that geology and farm runoff, I think it is clear that the expansion very likely has “the potential for significant environmental impacts” and that therefore an EIS is indeed justified.

It is important to note that the Daley Farm already significantly exceeds the limit that was set in the 1990s, but was grandfathered in. I also don’t buy the Farm’s arguments for the need to expand, especially when over 96 percent of dairy farms in Minnesota are 500 cows or fewer. Also, claiming that the operation needs to expand because more family members want to get involved raises the question of whether any limit, then, could ever be sustained. It is my belief that such a large, factory-farm style operation would be very detrimental to our environment and to the interactions within our rural communities.

Thank you for your consideration, and for the critical work you do overseeing the health of our environment and therefore of posterity.

Wendy Larson
2020 Clinton Drive
Homer Township
Winona County
Dear Kim Grosenheider,

We need an environmental impact study on the Daley Farms LLP’s dairy expansion proposal. Common sense, the geology of Winona County, and the scale of the proposed operation all require it.

Thanks for your consideration.

Sincerely,

Eric Utne
1484 Summit Avenue
St. Paul, MN 55105
ericutne@aol.com
612-325-3697
Good afternoon Kim,

My name is Aaron Thompson and I'm a resident of Minnesota. I am asking for an Environmental Impact statement on Daley Farms LLP's dairy expansion proposal.

As I understand things their proposal nearly triples the existing operation. As a resident I'm very concerned about the impact this will have on our ground water.

Please advise

Aaron Thompson

Get Outlook for Android
Ms. Grosenheider,

We need an Environmental Impact Statement on Daley Farms LLP’s dairy expansion proposal. Please be diligent with making decisions that affect our fragile environment, the well being of the people nearby and the economic impact of the property values of those people.

Janice Kittok
8403 County Line Road SE
Delano, MN 55328
To whom it may concern:

I am writing to encourage you to extend the review period to the stated deadline of November 15. Because of the porous nature to the soil in the area the large dairy poses a unique threat to the groundwater. There are other issues associated with the expansion as well. The excessive amount of water used by an expanded facility requires extensive study to ensure it doesn’t negatively impact the availability of groundwater for the communities and residences in the county.

John King
Long Prairie, MN
Dear Ms. Grosenheider

Please accept my comments on the Daley Farms EAW. This proposal definitely has the potential for significant environmental impacts, and should trigger a requirement by the MPCA that an EIS be done.

I live in Fillmore County, next to Winona County, and I have a vast amount of experience with these issues. I was on the MPCA staff and the Citizens Board in years past. I led our county’s committee to create its first Comprehensive Water Plan. I had a 40 year career in agriculture and environmental policy analysis. I worked nationally on feedlot laws and regulations, and helped pass Minnesota’s Groundwater Protection Act. Please accept these comments and order an EIS.

1. The EAW does not sufficiently address the precise nature of karst features that would impact the dairy facility dairy or manure deposition fields. The proposed liquid manure storage basin is larger than any built before in this region, and either catastrophic failure — or slow leaks — would have the potential of releasing 46 million gallons a year of nutrient-laden waste into groundwater, affecting wells and eventually surface water. Extremely detailed investigations must be conducted in an EIS to determine specific karst weaknesses deep under and around the facility, including electrical resistivity studies, dye traces throughout the county, and water quality analyses. The ever changing flowages of karst water are what makes a karst area unique. It is not a static system. Indeed, the very act of disturbing the soil and rocks, plus adding stormwater storage and drainage, plus placing and storing that volume of liquid above the karst constitute a perfect storm that will practically guarantee catastrophic pollution of regional waters. An EIS should study existing karst features of the site, and engineers should analyze the impact of construction of the facility itself in causing karst changes that could spell mass contamination of wells and trout streams.

2. An adequate and realistic emergency response plan would be impossible to formulate or carry out. A catastrophic breaching of the giant manure pit is not only possible, but very likely given the history of three community sewage ponds having already drained overnight. With 4,628 cows, there is no way to “turn off” the source of contamination. Those cows must continue creating manure no matter what. It is totally unrealistic to think that the Daley operation would evacuate the cows, much less kill them. Where could they be sent to if the pits had a sudden collapse? No alternative facility is available anywhere. Instead, MPCA has no mitigation options. Those cows would continue the ongoing pollution of our aquifers for years to come.

3. The level of groundwater use by the facility will be a major contributor to the very catastrophic failures of the manure pit that are feared. Such water withdrawal rates will change the karst groundwater system. Existing nitrate levels of communities nearby are already near or exceeding the maximum allowable level of 10 mg/L. The level of extraction will affect the volume of well water available to rural residences, farms and communities. This one dairy proposes to take nearly three times the amount of groundwater as nearby Lewiston. One business/farm should not be allowed to destroy all their neighbors’ water supplies.

4. It is not a legitimate argument to say that only large dairies, of such a size as to threaten the region with massive water pollution, can survive. At this time, 96 percent of Minnesota dairy farms are one-ninth the size of this proposal. It is Daley Farms that is out of synch with reality. We do not need massive water pollution in order to have our milk and dairy products! We need clean water too. Remember, those cows would need clean drinking water too!

Thank you for addressing these comments, and agreeing on the need to demand a full Environmental Impact Statement.

Sincerely,

Loni Kemp
Dear Ms Grosenheider,

Please do everything in your power to see that the expansion of the Daley Farms hog operation must submit to an in depth Environmental Impact Statement!
We, in this southeastern corner of Minnesota, have a fragile geology underlying our earth which makes our water source also very fragile.
Please vote for an EIS for the sake of south eastern Minnesota residents!

Thank you,

Barb Nagel

Sent from my iPad
Dear Ms. Grossenheider and the MPCA,

I am a proud citizen of the State of Minnesota. I love our gorgeous state, I love our wilderness areas, our vibrant cities, our robust economy and our agricultural backbone. All of these need to be in sustainable harmony for the long haul.

I am urging the MPCA to undertake a full Environmental Impact Review and public statement on the proposed Daley Farms mega expansion. Karst is delicate and once groundwater is polluted it cannot be undone. We need to steward our land for our children’s children and beyond.

Sincerely,
Roberta Benson
2640 Ulysses Street NE
Minneapolis, MN 56418
612.203.2872

Sent from my iPhone
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Sincerely,

Virginia Templeton
4327 abbott av s
Minneapolis, MN 55410
While the Daley Dairy farm in Lewiston already exceeds the Winona County Feedlot size maximum due to a grandfathered condition and currently poses potential harm to ground water in a karst prone area, Winona Climate Action Network would like to remind decision makers of the increased likelihood of extreme weather events making any increase in feedlot size an unsound idea. Additional cows also includes: increased methane and carbon dioxide, both greenhouse gasses that further increase climate change related risks of extreme weather events like heavy rains and flooding, which, in turn, increase the risks of contaminating ground water with manure.

This mega dairy poses greater risks to the environment than smaller scale operations that are aligned with the practice of local production for local consumption.

Sincerely,
Emilie Falc and the leadership team of the Winona Climate Action Network
In the early 1970s I lived in Winona and by the mid 1970s had purchased 140 acres of wild, undeveloped property along Cedar Creek, S.E. of Winona.

While I am no longer the co-owner, the property is still pristine and was once featured in a WCCO TV piece in their ongoing series Finding Minnesota, along with the adjoining farm operated by the Robert Briggs family.

I mention this background because it underscores my concern about the EAW for an expansion of the Daily Farms Dairy near Lewiston, Winona Co., which I have learned about in the past 2 weeks.

While I have concerns about this project on multiple levels, I just want to focus on water issues in this letter.

First, it is obvious that the DNR has multiple concerns about environmental issues connected with Daley's application to drill 2 new wells to service expansion of the dairy by almost 3,000 milk cows. Total water use projected at 92,000 gallons per month for the original and expanded operation, if approved.

There is no indication in the EAW as to whether the Jordan Aquifer can withstand being taxed to that degree. Presumably it is up to the DNR to pass judgement on this issue.

Secondly, a passage on pgs. 21 of the EAW states that "the Federal Clean Water Act requires that every state develop a plan to identify and restore any waterbody that is impaired by state regulations"

"The TMDLs and WRAPS for the S. Fork of the Whitewater River and Rush Creek call for decreasing the leaching loss of nitrate from cultivated acres in those stream watersheds."

The Daley farm is within these watersheds.

Daley does enumerate several measures to ensure that feedlot applications of manure do not "exacerbate" leaching loss of nitrate. But I'm sorry, that statement is counterintuitive.

Only a magician could perform a magic act on this scale, where a wave of a wand can make the nitrogen wastes from nearly 3000 added milk cows disappear if not incorporated into soil or living plants.

Like others before me, I'm sure, I urge MPCA to recommend an EIS for this project unless the DNR rejects the Daley application for new wells, thereby effectively disenfranchising the project.

Sincerely,

John F. Hick
St. Paul, MN
I would like to submit my comments AGAINST the Daley farm dairy expansion.

It is a horrible idea to store so much more potential pollution in such large quantities. Engineers always claim the structures will not leak nor will they overflow but they do fail. When they fail then there are all the reasons and excuses and damage.

I believe PREVENTION of pollution is the only sensible answer in our state, the risks are TOO HIGH to allow for contamination of so many citizens drinking water. It is NOT ACCEPTABLE to contaminate drinking water /ground water in our state. I live here because we are smarter than that.

A manure tanker just tipped over on HWY 52 near our home last week...because he was driving carelessly....I followed that truck through town loaded (overloaded I would guess) whose rear right spring appeared to be weak, later on my way back from town I met the truck, driving like a nut very fast and 1/2 on the shoulder running back for his next load to haul to a nearby farm to put on the field. You are mistaken when you think all this manure gets handled with a high level of responsibility. Down in the ditch it went, Watson creek? I don't know for sure where it goes from that corner.

What if Daleys don't get enough land leased for manure, I'm sure there is an answer to everything on paper but then reality happens AFTER the state okays the project. THEN WHAT??

The fields around here that are left fallow for a toilet for a large unsustainable farming operations are a disgrace, on slopes. How does that work when it rains? I could start taking pictures of run off.

You all are in denial of reality for what REALLY goes on out here.

They can diversify some safer way, or move to a state that welcomes nitrates, was it IOWA?

These big manure generating outfits should be zoned commercial, not Agricultural.

JUST SAY NO please.

Thank you
Leslea Hodgson
Fountain, MN
507-867-4004
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Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact.
on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County's ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

Richard Morris
613 4th Ave SE
Rochester, MN 55904
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

The EAW indicates that this factory farm expansion will generate 46 million gallons of liquid manure annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order the completion of an Environmental Impact Statement (EIS).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

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Sincerely,

Hootch Hanson
909 W. Lakewood Ave. , Unit 20
Lake City, MN 55041
If I saw the correct info given at the special farm expansion meeting regarding farm odor, there is no guideline for control of odor. I find that unbelievable. Odor is a huge problem for Lewiston, where I live. It affects our way of life, especially in the spring, summer and fall, we can't have windows open, hang clothes on the line or spend time outside. It's nauseating!! People are constantly complaining about the putrid smell. We don't make any money smelling Daley's manure. Guidelines must be established.
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Sincerely,

Mark M Giese
1520 Bryn Mawr Ave
Racine, WI 53403
We need to steward our precious water and avoid damage from mega-dairy operations in Winona county. What would the consequence of the proposed project be? Can we be assured that our children will have clean water to drink? Has the environmental study been done?

Linda D’Amico
October 22, 2018

Mark P. Gernes
Feedlot Permit Contact
Minnesota Pollution Control Agency
18 Wood Lake DR Southeast
Rochester MN 55904

Dear Mr Gernes,

Please record our comments with the Public Comments on the Daley Farms of Lewiston LLP 2018 Dairy Expansion. We have lived in Winona County since 1969 and have watched/participated in the development of Winona County Ordinances to protect the citizens, air quality, water quality (both ground water and trout streams), and farmland of Winona County. Now the Daleys wish to expand their operation that already exceeds the cap of 1500 animal units that was passed in 1998.

We do not want Winona County to permit this expansion and cannot understand why the MPCA is even investigating this operation for an expansion when it already exceeds the existing cap. Do not County Ordinances rule in instances like this? The Daley Farms are asking to take from our aquifer nearly the amount of water each year that would be needed to serve the city of Lewiston for three years. What is that going to do to the wells of the surrounding farmers and citizens of Lewiston in the future? But even of more concern is the amount of liquid manure which will be stored and eventually spread on the surrounding farmland owned by the Daleys. With our karst topography and the frequent incidence of sinkholes developing in the area, the storage lagoons present a constant danger to the groundwater and nearby trout streams. When the manure is spread, the wells and trout streams in the area will be exposed to nitrate contamination due to our karst topography and run-off as well.

It is the responsibility of the MPCA to follow Minnesota law to protect the environment, water quality and quantity, air quality, health and quality-of-life for all citizens of Minnesota. The Daley application should have been denied outright given Minnesota laws and Winona County Ordinances. The very least the MPCA can do is require an extensive environmental study, an Environmental Impact Statement. When the Daley proposal would result in the largest confinement operation in southeastern Minnesota, the citizens deserve to know all of the risks involved.

We support family farms. Unfortunately, this type of mega-farming is making it impossible for family farms to survive and succeed.

Please keep the environment, air, water, and citizens of Winona County healthy by denying the application or at the very least requiring a thorough Environmental Impact Statement (that should be required of any proposal of this magnitude) before any final decisions are made.

Sincerely,

Nancy and James Reynolds
4455 West 7th ST
Winona MN 55987
October 19, 2017

Mark P. James
Feedlot Permit Contact
M. P. C.A.
18 Wood Lake Dr. SE
Rochester, MN 55904

Dear Mr. James:

As someone who lives in an area of the state with serious water quality issues, I am asking you to require an Environmental Impact Statement on the proposed expansion of the Daley Farm in Lewiston.

By more than doubling their herd of cattle, they will be putting the surrounding area in serious danger of water (not to speak of soil and air) pollution.

The good of the larger community must take precedence over the profits of one company.

Thank you for your consideration of these concerns.

Respectfully,

Nicholas Nichols
6460 Lakeview Ave S
Cottage Grove, MN 55016

nicholsmabel@yahoo.com
To the Minnesota Pollution Control Agency

Requesting an Environmental Impact Statement for the Daley Farms, Lewiston MN, proposed expansion.

The MPCA holds a responsibility to the citizens of Minnesota for the long-term protection of our environment. One of the ways of providing that protection is by requesting that an Environmental Impact Statement be required to determine if a proposed project might cause such damage. After reading the EAW for the proposed Daley Farm expansion, I feel an EIS is called for. An EIS is a part of the MPCA’s responsibility for a project of this size, especially when the possibility of a catastrophe exists. An EIS can provide confidence that the proposed plan is safe for all concerned.

There are several areas of concern involving the amount of water needed, the potential degradation of the area’s water supply, and economic impacts. In terms of water supply, in Attachment R it specifically states “the proposed rate and volume of water may interfere with other water users and have a negative impact on lakes, streams and wetlands”. That statement is followed by a list of seven potential concerns. Considering they are asking for 93 million gallons of water a year that concern is justified. Also, existing water appropriation permits with higher priorities (Statute 103G.261) already exist in the area. There are Municipal Well head Protection Areas in the vicinity. What happens if there is not enough water for the Daley operation? How will the draw off 93 million gallons of water affect other wells in the area? Will its quality be changed? These are questions that need to be explored.

The potential for water degradation exists because of the topography of the area. As a Karst area with multiple sink holes, runoff can easily enter the water supplies of not only the immediate area but all the Karst area. One of the sink holes is even marked on the site map and is just off the proposed site plan. The city of Lewiston, located within two miles of the farm lost its lagoon system in a sink hole in the 1990s. Luckily that lagoon was treated water. The potential for disaster is real. Also, there already exists a high concentration of nitrates in many area wells including city supplies which requires special handling. Any increase would cause considerable harm.

There also seems to be some economic factors that should come into play. The amount of product from an operation of the projected size will impact other dairies in the area. Small producers may be forced out, prices may drop in a market that already is stressed. What happens to the local economy, school systems, and churches if there is a measurable reduction of small farms in the area?

Margaret Lambert
1463 Gilmore Valley Road
Winona MN 55987
Comment Sheet
Proposed Daley Farms expansion
Environmental Assessment Worksheet
and Individual Feedlot Permit Coverage

Your comments!

If you would like to comment on the Environmental Assessment Worksheet (EAW) and Individual Feedlot Permit for Daley Farms' proposed dairy expansion in Winona County, Minnesota, please use this form and mail it to:
Kim Grosenheider, MPCA, 520 Lafayette Road N., St. Paul, MN 55155. You may also submit comments online:
http://survey.mn.gov/s.asp?id=153730433478. Written comments must be received by 4:30 p.m., Oct. 31, 2018.

Having lived and worked in ag. related fields a majority of my adult lives, my husband grew up on a large farm here and has and is still running a welding machine business. I worked as a secretary for a milk company in the area and then spent 30 yrs. in the welding business with my husband, so we do have a little agricultural background. I have some concern with so many cows in a small area, however, I do believe this does need to be decided on a case by case basis, each being different and each having

(For additional space, continue on backside of this sheet.)

| Name (Required. Please print.) | Rhonda Schell |
| Address (Required. Please print.) | 116 Washington St. |
|  | Rollingstone, MN 55969 |
its own concerns. I believe there are farmers who could not and do not manage a 100 cow farm and should not be allowed even that. I believe the Daleys as a family not only could manage a large increase in their herd, but would do it well. I understand that it is necessary to increase the number of animal units to provide an income to the family members there, as well as those who want to come into the family business. Because we are losing so many family farms I think we should do what we can to save the ones who are good stewards of land, animals and family. Many of the Daleys are college educated. In the fields they excel in on the farm. They know what it takes to operate a business of that size; hence the maintenance and expansion is required.

I understand concerns for the groundwater and the manure pit, but doesn't it make sense to be in constant observation of one pit than to have 3 or 4 pits spread throughout the region? The Daleys maintain a boat in the pit, keeping a good ph level for the pits and stirring the solids throughout which maintains consistency. They have a good record and know the spreading rates for the fields. They are involved in all forms of dairy production on all different levels. The farms are clean and safe and open to the public and yet only one person who wants an EIS study has even visited them.

I applaud the MPCA for the work they do, but permit these expansions "CASE BY CASE". Some people should not have a farm at all and yet... I live in Rollingstone, downhill from all the Daleys... if anyone is going to stand over me and my family with a load of manure on one hand and feeding me with the other... I want it to be a Daley!
Comment Sheet
Proposed Daley Farms expansion
Environmental Assessment Worksheet
and Individual Feedlot Permit Coverage

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Pg 5 of EAW describes manure basin construction proposed "install a drain tile system around the base of the manure basin to control fluctuations in seasonal saturation," climate change patterns for SE MN project [see MN Dept of Health Aug 2018 Planning for Climate & Health Impacts in SEMN] - p 3

An increase in weather events & related natural disasters ...

a higher frequency of very heavy rain events...

An EIS is needed to gather research impacts of weather patterns change on proposal - not just the manure basin but also the other structures/buildings for "storm runoff capacities."

(For additional space, continue on backside of this sheet.)

| Name (Required. Please print.) | Joyce E. Ford |
| Address (Required. Please print.) | 31722 Wiscoy Ridge Rd |
| | WINONA, MN 55987 |

Minneapolis Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194
(651) 296-6300, toll-free (800) 657-3864, TTY (651) 282-5332 or (800) 657-3864
This material can be made available in alternative formats for people with disabilities.

* Printed on recycled paper containing at least 30 percent fibers from paper recycled by consumers.
Additional EIS considerations needed

- Impact on existing aquifer with increased water usage
- Impact of increased animal units overall in Winona County and capacity of available land/fields to absorb manure applications from all feedlots collectively

At some point in time Winona County will not be able to accept more manure applications. Water quality in the townships has already been compromised by nitrates and other farming-related chemicals. We must consider the totality of manure usage, not just farm by farm. See MDA map of nitrate contamination from study of wells tested in 2016.

While this proposal addresses existing violations from buildings without runoff controls, these violations should not have been allowed to continue "indefinitely." MPCA has been negligent.
That is greed to have that many animals in one location. That's not helping middle income or small farmers in fact in probably pushes them out of business.

It's also not good for the animals, don't produce the best milk results and far more septal to disease. It's hard to control that much manure. A horse defecates 350 pounds of manure in one week I imagine the same for a cow.

The production dairy farm I visited in Kansas, the animals are seen as dollars and cents and if they fail to produce just a tiny bit under their 30 lbs a milking they went to slaughter. That's not what this county is about, mass production at the expense of animals.

We can feed the people of the world and ourselves without 4,628 cows in one place.

Jean F. Schilling
Rural Property Owner, Minnesota

Warren Buffett: “There seems to be some perverse human characteristic that likes to make easy things difficult.”
Hello:

One of these times the corporations will have a personal impact on your life and you'll remember the day you gave away the farm for profit instead of to protect people.

We need an Environmental Impact Statement on Daley Farms LLP’s dairy expansion proposal.

Mary Voight

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of stumalanaphy@hotmail.com <stumalanaphy@hotmail.com>  
Sent: Tuesday, October 30, 2018 3:44 PM  
To: Grosenheider, Kim (MPCA)  
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

Dear Ms. Grosenheider:

I am submitting comments to the EAW on the Daley Farms of Lewiston, LLP dairy expansion proposal near Lewiston, Winona County. According to the EAW, this factory farm expansion will generate 46 million gallons of liquid manure annually. It will also use 92 million gallons of groundwater annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order an Environmental Impact Statement.

This factory dairy operation, with its multi-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in April 1976, Lewiston in 1991, and Bellechester in April 1992.

The MPCA must analyze what the impact of a catastrophic failure of this multi-million-gallon manure pit would be, and that requires an EIS. The DNR, in its analysis for an initial permit for drilling of an additional well for this expansion stated that "the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If such negative impacts happen for lakes, streams and wetlands, how would that damage be undone and how much time might restoration take if at all possible?

This project would annually use 92 million gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. What will be the impact on our aquifer of this major annual use of water? The 3 actions that can lead to sink hole development in karst country are, moving earth (digging, displacement), pumping water and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. Since ground water is present at averages between 16 and 20 feet only in the area where manure storage is planned, how will ground water be protected? How will fissures and geologic collapse be avoided?

The proposal will produce 46 million gallons of manure and wastewater in an area where karst
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Well testing conducted by the Minnesota Department of Agriculture in 2016 showed that "46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates."

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Historic Mega-Rain Events in Minnesota - Minnesota DNR ...
www.dnr.state.mn.us

Minnesota is no stranger to heavy rain events. The early surveyors mapping out the state witnessed such events. The DNR climate office has assembled a list of so-called "Mega-rain" events that have occurred since statehood.

Pg. 23: Since there is no rating for determining a sensitivity of the water table because of the surface karst feature development, how can the MPCA accept only this EAW in determining possible ill-effects of this expansion? Th EAW does not address the potential negative economic impacts for neighboring farms and especially small and mid-sized dairy farmers.

Sincerely,

Sincerely,

stuart malanaphy
N7375 910th St.
Riverfalls, WI 54022

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Dear Kim Grosenheider,

I believe that all Concentrated Animal Feeding Operations (CAFO) take a toll on people living close to these operations in regard to smell, water use, water pollution, erosion and degradation of land. That alone is deeply unfair.

Water use: the expansion of the Daley Farms expansion would use 92 million gallons of water per year compared to the city of Lewiston’s 33.5 million.

Water pollution: wells tested by MDA in 2016 showed that 46% of well tested in Utica Township exceeded the safe drinking water standards for nitrates. According to the USDA Natural Resources Conservation Service 250 cows produce as much nitrate/nitrogen as 5000 people

I am deeply concerned about the project at hand. First of all The Daley Farms Mega-Expansion grossly violates Winona County’s 1500-animal unit cap. Everybody else has to comply why not Daley Farms. A permit should not be granted. Winona County already has 13 other feedlots.

Second, the size of this expansion, tripling the animal units, warrants an Environmental Impact Statement (EIS) to allow for an in depth study when dealing with the vulnerable karst landscape of SE Minnesota. Twice have sewage lagoons in the past disappeared in a sinkhole. What proof do you have that a manure holding lagoon the size of 3 football fields, 16 feet deep will hold in this karst landscape. In depth modeling needs to be done first.

In closing I want to express my disappointment with MPCA in this matter. I hope you reconsider your role as watching out for people’s health not those of cows and pocketbooks.

Sincerely

Angela Anderson

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Historic Mega-Rain Events in Minnesota - Minnesota DNR ...

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Sincerely,

Sincerely,

Lawrence Krantz
9180 Goodnuff Ln NE
Bemidji, MN 56601-9780

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of 
jtachen@csjstpaul.org <jtachen@csjstpaul.org>
Sent: Tuesday, October 30, 2018 3:34 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

Dear Ms. Grosenheider:

I am submitting comments to the EAW on the Daley Farms of Lewiston, LLP dairy expansion proposal near Lewiston, Winona County. According to the EAW, this factory farm expansion will generate 46 million gallons of liquid manure annually. It will also use 92 million gallons of groundwater annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order an Environmental Impact Statement.

This factory dairy operation, with its multi-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in April 1976, Lewiston in 1991, and Bellechester in April 1992.

The MPCA must analyze what the impact of a catastrophic failure of this multi-million-gallon manure pit would be, and that requires an EIS. The DNR, in its analysis for an initial permit for drilling of an additional well for this expansion stated that "the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If such negative impacts happen for lakes, streams and wetlands, how would that damage be undone and how much time might restoration take if at all possible?

This project would annually use 92 million gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. What will be the impact on our aquifer of this major annual use of water?

The 3 actions that can lead to sink hole development in karst country are, moving earth (digging, displacement), pumping water and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. Since ground water is present at averages between 16 and 20 feet only in the area where manure storage is planned, how will ground water be protected? How will fissures and geologic collapse be avoided?

The proposal will produce 46 million gallons of manure and wastewater in an area where karst
geology channels contaminants from surface water deep into the ground.

Well testing conducted by the Minnesota Department of Agriculture in 2016 showed that "46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates."

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Historic Mega-Rain Events in Minnesota - Minnesota DNR ...
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Pg. 23: Since there is no rating for determining a sensitivity of the water table because of the surface karst feature development, how can the MPCA accept only this EAW in determining possible ill-effects of this expansion?
Th EAW does not address the potential negative economic impacts for neighboring farms and especially small and mid-sized dairy farmers.

Sincerely,

Sincerely,

Jennifer Tacheny
269 Erie St, --
St. Paul, MN 55102

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Sincerely,

Sincerely,

Jean Greenwood
4515 Garfield Ave.
Minneapolis, MN 55419-4848

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of Eoness@winona.edu <Eoness@winona.edu>
Sent: Tuesday, October 30, 2018 3:28 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

Dear Ms. Grosenheider:

I am submitting comments to the EAW on the Daley Farms of Lewiston, LLP dairy expansion proposal near Lewiston, Winona County. According to the EAW, this factory farm expansion will generate 46 million gallons of liquid manure annually. It will also use 92 million gallons of groundwater annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order an Environmental Impact Statement.

This factory dairy operation, with its multi-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in April 1976, Lewiston in 1991, and Bellechester in April 1992.

The MPCA must analyze what the impact of a catastrophic failure of this multi-million-gallon manure pit would be, and that requires an EIS. The DNR, in its analysis for an initial permit for drilling of an additional well for this expansion stated that "the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If such negative impacts happen for lakes, streams and wetlands, how would that damage be undone and how much time might restoration take if at all possible?

This project would annually use 92 million gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. What will be the impact on our aquifer of this major annual use of water?

The 3 actions that can lead to sink hole development in karst country are, moving earth (digging, displacement), pumping water and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. Since ground water is present at averages between 16 and 20 feet only in the area where manure storage is planned, how will ground water be protected? How will fissures and geologic collapse be avoided?

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Sincerely,

Sincerely,

Elizabeth Oness
672 West Wabasha St.
Winona, MN 55987

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Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

The EAW indicates that this factory farm expansion will generate 46 million gallons of liquid manure annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order the completion of an Environmental Impact Statement (EIS).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After
expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County's ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not
expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

Sue Griebel
12327 170th St
New Ulm, MN 56073-4461

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of
gene@outinthewoods.us <gene@outinthewoods.us>
Sent: Tuesday, October 30, 2018 3:24 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

Dear Ms. Grosenheider:

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Sincerely,

Sincerely,

Gene Kremer
3938 Cannon Ball Lake Rd
Duluth, MN 55803-8209

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From: Nancy Higgins <nanhigs@gmail.com>
Sent: Tuesday, October 30, 2018 3:20 PM
To: Grosenheider, Kim (MPCA)
Subject: Huge Farm

An environmental study needs to be done on the Daley Farms LLP;s dairy expansion proposal.

This literally is a lot of shit! I see it as having serious negative consequences to the environment. I believe it will affect the land, water and air. We need to look more to the future generations and preserve our water & land & air.

I can't help but think this is just greed operating. If 3000 more cows are allowed now, how many more later? sets precedence for other huge factory farms if allowed to happen.

I personally support small farmers when shopping for groceries. I also support those who practice good land stewardship.

Sincerely
Nancy Higgins
1753 Randolph Ave #2
St Paul, MN
Keeping this short. Any expansion that uses

**92 Million Gallons of Groundwater & Produce 46 Million Gallons of Manure**

*any where is a disgrace. If this venture is being given serious thought than an environmental review is a requirement no short cuts. I do believe that farms of 300 animals should be the norm. Please allow the proper review by the Clearly, this factory farm has the “potential for significant environmental impacts” and needs an Environmental Impact Statement. Please no shortcuts!!*

Thank you.

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Dear Mr. Grosenheider,

The proposed scale of expansion (increasing the cows herd from 1,728 cows and calves to 4,628) that Daley Farms LLP of Lewiston is requesting should require an Environmental Impact Assessment without hesitations! An EIS is legitimized by the fact that the proposed Mega-Farm will have a huge environmental impact for Winona. For example, it will use about 92 million gallons of water annually. This volume of fresh water (equivalent to 36 milk trucks that every day would be needed by Daley Farms), could put area wells at risk of flow for such needs by a single water user. In return the operation will generate about 46 million gallons of manure and wastewater to be disposed annually, in an area where karst geology channels contaminants (eg.: nitrogen, phosphorus, enteric bacteria like E. coli, Shigella, Salmonella) from surface waters deep down into aquifers, from where the same is pumped to be used. Also, the storage of raw cow manure and waste waters in lagoons does not make me feel any safer from the risks of land and water contaminations because lagoons overflow, or break from time to time (especially during heavy rain storm precipitations).

What about air quality? Have we forgotten the environmental disaster of the Excel Mega-Dairy in Thief River Falls, MN, which caused the evacuation of its residents in 2008, due to levels of hydrogen sulfide (H2S) in the air 2-3 hundred times higher than the 30 ppm/l safety threshold? What about more dangerous gases released by animal feedlots like Daley Farms? I am referring to ammonia (NH3) and methane (CH4). Ammonia and hydrogen sulfide are irritant to animals’ respiratory systems. A prolonged exposure to these gasses affects the functioning of lungs and respiratory ways, causing stress, which may lead to asthma, cardiovascular problems and, eventually, premature death. I am thinking about the health deterioration as a cascading effect for the children and residents of Lewiston and Utica should the Daley Farms be granted permission to expand their operation. Aren’t the farm owners, their children and grand children going to be affected too by the scale of such an expansion?

I am disturbed also by the fact that the Daley Farms are already exceeding the limit of 1.500 animal units (they presently raise 2.275 animal units) and thus would need a variance from the Winona Co. Board of Adjustment. Therefore, if laws like the animal units-cap provision are
rules that have been agreed upon after endless hours of deliberations and consultations with professionals and experts (including farmers), and local citizens, why (I am wondering), the rule should be change?
And (more importantly), what if more farmers wish to expand their operation/s in the future? Wouldn’t the Daley Farms case create a precedence for which further requests of expansion could NOT be denied? I think these questions are legitimate and reasonable to ensure that an EIS is accomplished before allowing an establishment of a mega-dairy farm in Winona County.

Sincerely,
Bruno Borsari, Ph.D.
260 Liberty St.
Winona, MN 55987
Ph.: 507-454-5041

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I am opposed to the Daley Farm expansion. Because of our karst topography we cannot sustain clean water under such an expansion. We already have many contaminated wells in the county, and this will only add to the problems. Moreover, this kind of factory farming, even if done by a large family such as the Daley's, is not suited to this area and will put even more pressure on smaller farms who will find it hard to compete. Please ask for a complete and exhaustive environmental review before making any decisions.

Jane Cowgill
317 Walnut St
Winona, MN 55987

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of eric09nels@gmail.com <eric09nels@gmail.com>
Sent: Tuesday, October 30, 2018 3:17 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

Dear Ms. Grosenheider:

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The MPCA must analyze what the impact of a catastrophic failure of this multi-million-gallon manure pit would be, and that requires an EIS. The DNR, in its analysis for an initial permit for drilling of an additional well for this expansion stated that "the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If such negative impacts happen for lakes, streams and wetlands, how would that damage be undone and how much time might restoration take if at all possible?

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Sincerely,

Sincerely,

Eric Nelson
551 E. 8th St.
Winona, MN 55987

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From: Jan Dahl <dahljan6@gmail.com>
Sent: Tuesday, October 30, 2018 3:12 PM
To: Grosenheider, Kim (MPCA)
Subject: Environmental Impact Statement

This factory farm has the “potential for significant negative environmental impacts” and needs an Environmental Impact Statement!

I'm AN ACTIVE participant (not a farmer, not a politician); however, I VOTE, I love Minnesota's clean air, lakes and earth. Elections are coming next week. Please consider my request!

Sincerely,

Jan Dahl
Royalton, Minnesota

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of bborsari@winona.edu <bborsari@winona.edu>
Sent: Tuesday, October 30, 2018 3:09 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

Dear Ms. Grosenheider:

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Sincerely,

Sincerely,

Bruno Borsari
260 Liberty St.
Winona, MN 55987

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of 
lorettajaus@hotmail.com <lorettajaus@hotmail.com>
Sent: Tuesday, October 30, 2018 3:07 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Loretta Jaus
22891 651st Ave
Gibbon, MN 55335-2077

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Mike Kennedy
316 W 7th St
Winona, MN 55987

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of nancy conger
<mailagent@thesoftedge.com>
Sent: Tuesday, October 30, 2018 3:06 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Sincerely,

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nancy conger
8010 275th Ave NE
North Branch, MN 55056

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of bob@emphasislighting.com <bob@emphasislighting.com>
Sent: Tuesday, October 30, 2018 3:01 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Sincerely,

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Bob Sirchia
3375 Stark Rd NE
Cambridge, MN 55008

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of cpeckover@live.com <cpeckover@live.com>
Sent: Tuesday, October 30, 2018 2:53 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Sincerely,

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Chris Peckover
118 Park St
Rollingstone, MN 55969

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of jacantine@gmail.com <jacantine@gmail.com>
Sent: Tuesday, October 30, 2018 2:52 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Jennifer Cantine
3501 44th Ave S
Minneapolis, MN 55406

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Michelle Gobely
1581 Wheelock Ln Apt 202
Saint Paul, MN 55117

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Kim,
Please authorize an EIS on the proposal to expand Daley Dairy Farms - You know well that any operation that will produce 46 million gallons of liquid manure and use 92 million gallons of ground water needs a careful, thorough review before any expansion of their permit.

Thank you,
Margot Monson

--
Margot Monson, MS Entomology, aquatic biologist
22 Ludlow Ave.
St.Paul, MN  55108
651-644-3749

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This project would annually use 92 million gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. What will be the impact on our aquifer of this major annual use of water?

The 3 actions that can lead to sink hole development in karst country are, moving earth (digging, displacement), pumping water and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. Since ground water is present at averages between 16 and 20 feet only in the area where manure storage is planned, how will ground water be protected? How will fissures and geologic collapse be avoided?

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https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html

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Th EAW does not address the potential negative economic impacts for neighboring farms and especially small and mid-sized dairy farmers.

Sincerely,

Dorothy Dolezal
3005 West 43rd St
Minneapolis, MN 55410

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Dear Ms. Grosenheider:

I am submitting comments to the EAW on the Daley Farms of Lewiston, LLP dairy expansion proposal near Lewiston, Winona County. According to the EAW, this factory farm expansion will generate 46 million gallons of liquid manure annually. It will also use 92 million gallons of groundwater annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order an Environmental Impact Statement.

This factory dairy operation, with its multi-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in April 1976, Lewiston in 1991, and Bellechester in April 1992.

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Sincerely,

Sincerely,

Laura Inman
72435 160TH AVE
HAYFIELD, MN 55940

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From: sarah orman <absolutesarah@hotmail.com>
Sent: Tuesday, October 30, 2018 2:49:34 PM
To: Grosenheider, Kim (MPCA)
Subject: Environmental Impact Statement on Daley Farms LLP’s dairy expansion proposal

I want to add my voice and concerns.
We need an Environmental Impact Statement on Daley Farms LLP’s dairy expansion proposal. Our planet is fragile and we are in the midst of the devastating effects of climate change. Before anymore damage is done, there is time to review and study the impact of this herd expansion on the land.
Thank you,
Sarah E. Orman

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of Doreen Kloehn <mailagent@thesoftedge.com>

Sent: Tuesday, October 30, 2018 2:48 PM

To: Grosenheider, Kim (MPCA)

Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

Dear Ms. Grosenheider:

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Historic Mega-Rain Events in Minnesota - Minnesota DNR ...

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Sincerely,

Sincerely,

Doreen Kloehn
4036 Xerxes Ave S
Minneapolis, MN 55410

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From: k l <kl30@hotmail.com>
Sent: Tuesday, October 30, 2018 2:47:36 PM
To: Grosenheider, Kim (MPCA)
Subject:

I am very concerned about mega farms. The wells required will crowd out local farmers or force them to dig deeper.

If the cattle are milked 24/7 how much noise and odors will neighbors and livestock have to listen to.

Ken Lyons
Lake Cty
Member of the Land Stewardship Project.

Sent from Mail for Windows 10

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of carolynecarr@hotmail.com <carolynecarr@hotmail.com>
Sent: Tuesday, October 30, 2018 2:45 PM
To: Grosenheider, Kim (MPCA)
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Sincerely,

Sincerely,

Carolyn Carr
4050 39th Ave. S.
Minneapolis, MN 55406-3433

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From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> on behalf of elizabeth@spiritualmemoir.com <elizabeth@spiritualmemoir.com>
Sent: Tuesday, October 30, 2018 2:43 PM
To: Grosenheider, Kim (MPCA)  
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

Dear Ms. Grosenheider:

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Sincerely,

Sincerely,

Elizabeth Jarrett Andrew
4244 24th Ave S
Minneapolis, MN 55406-3028

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Dear Ms Grosenheider:

I am submitting comments on the proposal of Daley Farms of Lewiston, LLP, to expand its dairy option to about three times its current capacity - to 4,628 cows.

A dairy of this size is highly unusual for Minnesota (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php), which means that Daley Farms' proposal must be carefully considered. The proposal should not be granted unless Daley Farms provides evidence demonstrating that it truly has the capability to deal with waste on an ongoing basis and in extreme weather events, that it will operate the farm in conformity with all applicable requirements, that it will prevent pesticide contamination, and that it will not threaten the aquifer.

Waste

USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211). As a result, Daley Farms' proposal for a threefold increase to its operation is like adding 20,000 people, in terms of the nitrogen produced. The impact of this increased nitrogen load must be fully analyzed through an EIS.

In addition, Daley Farms' proposed operation will produce 46 million gallons of manure and store store 35.6 million gallons of raw liquid manure. The proposed factory dairy operation will be located in an area of the state (1) where 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them, (2) with similar geological formations as Utica Township, where 46.3% of the wells tested exceeded the safe drinking water standard for nitrates in 2016 (www.mda.state.mn.us/townshiptesting), (3) that has been hit by three storms since 2004 that dumped over 9 inches of rain over a 24- to 36-hour period (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

The capacity of the proposed lagoon, located in an area that is vulnerable both geologically and weather-wise, is not designed to handle this kind of rainfall situation. The Minnesota Pollution Control Agency must conduct an EIS to assess the impact of a catastrophic failure of the manure pit. Moreover, MPCA feedlot official, Mark Gernes, stated that 75% of Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. Given this history, Daley Farms also needs to demonstrate that its day-to-day operations will actually conform to all local, state, and federal requirements, rather than simply asserting that it hypothetically could conform.

Pesticides

When nitrates are found in drinking water, the same wells and aquifers often also are contaminated with pesticides. Daley Farms has not shown how it will measure and mitigate pesticides and protect humans and animals from carcinogens due to run-off and leakage of contaminated water.

Water

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS.

Sincerely,

Margaret Mahoney
4215 24th Ave S
Minneapolis, MN 55406
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult for the public, for neighboring farmers, rural residents and township residents to trust that they MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

It is not clear from the EAW, how Daley Farms' proposed expansion would improve the quality of life, including the quality of health, for area residents.

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events—since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County’s ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

Donald Greenebaum
15055 Riverside Ave N
Marine On Saint Croix, MN 55047-8722
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

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Jessie Pinney
1449 Bertram Dr
Maple Plain, MN 55359-5031
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56810 122nd Ave
Minneiska, MN 55910-3018
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Kathleen Felt
702 Cornelia St.
North Mankato, MN 56003
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Virginia Templeton
4327 Abbott Ave S
Minneapolis, MN 55410-1442
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com>  On Behalf Of aspenglowsetters@msn.com
Sent: Saturday, November 03, 2018 11:08 AM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Gary Johnson
240 60th Ave NE
Willmar, MN 56201-9195
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of Clinthtle2@gmail.com
Sent: Saturday, November 03, 2018 4:42 PM
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Clinton Carl Hertle Hertle
2610 main st s Austin mn
Austin, MN 55912-6127
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I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 our of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult for the public, for neighboring farmers, rural residents and township residents to trust that they MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

It is not clear from the EAW, how Daley Farms' proposed expansion would improve the quality of life, including the quality of health, for area residents.

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.
The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County’s ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

Joel Schmidt
12430 County Road 1 NW
Pennock, MN 56279-9667
Dear Ms Grosenheider:

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The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

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Sincerely,

Wendy Haan
3824 47th Ave S
Minneapolis, MN 55406-3606
Dear Ms Grosenheider:

Thank you for reading my comments. I want to preface them with a few facts. 1) I grew up on a dairy farm, 2) I have friends who work on a dairy farm now 3) I formerly worked for the Ag Programs at Southwest Minnesota State University where I met many people who are well-known throughout the Ag Industry in Minnesota as well as a couple national figures 4) I only skimmed the Environmental Assessment Worksheet and did no research of my own 5) I have partnered with Land Stewardship Project briefly in 2017 through my involvement in LSP’s work to shape the latest iteration of the Farm Bill. After I left my position with SMSU_Ag I didn’t continue active involvement but found the LSP members and staff I interacted with to be hard-working practical people who care about their community 1st, bottom line 2nd and a 3rd major priority they seemed to have in common was an honest realization that their involvement was needed to protect/strengthen agriculture through stewardship of natural resources for our future generations. The first meeting I went to, my youngest son Cooper who is 11 going on 83 (#OldSoul #Hunting/Fishing/Farming #CountryBoyStuckInTheCity) had to come with me. After he met some of the old farmers, younger farmers, LSP staff and he listened to the topics discussed he asked LSP staff, "Is there an age limit to becoming an LSP member?" Like the others I met, he genuinely cared about the topics discussed related to the Farm Bill. He even got involved in the planning and implementation of a public meeting with Collin Peterson at Redwood Falls. 5) I have not vetted LSP’s form letter but if what they say is true, there are serious reservations about this Daley project that at a minimum need further study 6) my own comments will be in Caps lock henceforth (not to scream but to delineate my comments from the form letter). Thanks again for reading and any thought you give to my comments.

Grant Will
113 E Street
Marshall, MN 56258

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

I helped my dad host the "DISPLAY HERD" at the Minnesota State Fair this past year. It allowed me the opportunity to visit with people across the state. My upbringing on the dairy farm was miserable and I had and still have no interest in dairy farming myself. However, I am an educator by profession, sociologist by training and a curious mind by nature. Any conversation that I had with farmers at the state fair featured me as a genuinely interested questioner/listener not an opinion purveyor. Every single farmer lamented the turn to corporate Ag. More importantly, after allowing a little venting/complaining as farmers are wont to do in my experience I always asked what is coming next as a result of the clear turn to corporate Ag. Again, every single farmer told me that they think it will lead to degradation of the environment. Personally, I'm not sure if that is true. It may be but I presume like most things it can be viewed through a lens more like a spectrum not a lens of clear black and white.

Yes, I care about the environment but most people do. Again "Caring for the Environment" in my opinion is seen on a spectrum.
MOST IMPORTANTLY THOUGH, PLEASE HEAR THIS!...THE TURN TO CORPORATE AG HAS ALREADY, IS ACTIVELY CONTINUING TO AND APPEARS TO NOT BE ABLE TO BE REVERSED OFF THE "RUIN MINNESOTA'S RURAL TOWNS TRAIN" THAT IS CHANGING OWNERSHIP OF LAND FROM INDIVIDUAL/FAMILY FARMS TO LARGE CORPORATE ENTITIES. I PERSONALLY KNOW FARMERS WHO HAVE BEEN FORCED TO SELL OFF LAND ASSETS TO THE HIGHEST BIDDER, A CORPORATE AG ENTITY. THERE IS A SHIFT OCCURRING IN LAND OWNERSHIP THAT I THINK HAS BEEN PRECIPITATED BY CORPORATE AG ENTITIES BUT I KNOW IS BEING TAKEN ADVANTAGE OF NOW BY CORPORATE AG. AS SMALLER FARMERS BEGIN TO BE PHASED OUT BY SYSTEMIC ISSUES LARGELY, BUT ALSO INDIVIDUAL SITUATIONS, LAND ASSET SALES ARE THE CHOICE OF LAST RESORT. IT TAKES MONEY TO MAKE MONEY AND CORPORATE AG HAS A PURCHASING POWER GREATER THAN INDIVIDUALS THAT IS CHANGING THE NATURE OF LAND OWNERSHIP IN OUR STATE. I HOPE THAT YOU WILL SIMPLY CONSIDER THAT NUMEROUS INDIVIDUALS/FAMILY FARMS LOGICALLY ARE NATURALLY INTERTWINED IN THE FABRIC OF RURAL COMMUNITIES WHILE CORPORATE AG LIKELY VIEWS COMMUNITY INVOLVEMENT MORE OFTEN AS A MECHANISM THAT HELPS ACHIEVE THE GOAL OF MAXIMIZING PROFIT. I DON'T MEAN THAT AS A VALUE STATEMENT OF FACT. I MEAN IT AS A LOGICAL CONCLUSION THAT AGAIN IS, IN MY OPINION VIEWED AS A SPECTRUM.

THANKS FOR STAYING WITH ME :) 

NOW, CONSIDER THE NEXT COMMENT THAT EVERY SINGLE DAIRY FARMER THAT I LEARNED ABOUT THE NATURE OF THE DAIRY INDUSTRY FROM AT THE STATE FAIR POINTED TO LARGE DAIRY FARMS LIKE THE ONE PROPOSED HERE AS THE KEY COG IN THE DESTRUCTIVE TREND OF DAIRY FARMING FOR SMALLER OPERATORS. AGAIN, ANECDOTALLY BUT UNANIMOUSLY, THE 30 OR SO MEN AND 2 WOMEN I LEARNED FROM LAMENTED THE ROLE OF BIG DAIRIES MORE SO FOR THE ROLE IN RURAL COMMUNITY DEGENERATION BIG DAIRIES PLAY THAN TO THEIR OWN BOTTOM LINE. SADLY OR COURAGEOUSLY, MOST OF THE FOLKS I LEARNED FROM INDICATED THAT THEY THEMSELVES WOULD SURVIVE BUT THOUGHT MANY OF THEIR PEERS COULDN'T.

IN SUM, LAND OWNERSHIP IS CHANGING HANDS FROM INDIVIDUALS/FAMILIES WHO MAKE UP THE FABRIC OF RURAL MINNESOTA TO CORPORATE/LARGER BUSINESS ENTITIES WHOSE NATURAL GOAL IS TO MAXIMIZE PROFIT.

PLEASE KEEP IN MIND MY CENTRAL THEME AS YOU CONSIDER THE COMMENTS/QUESTIONS I HAVE OF THIS PARTICULAR PROJECT NEAR LEWISTON. I'M NOT FOR DENYING CORPORATE AG ANY RIGHTS IT IS ENTITLED TO. LIKewise, I'M NOT FOR ELEVATING CORPORATE AG RIGHTS OVER ANY RIGHTS CITIZENS ARE ENTITLED TO.

I HAVE 2 FRIENDS WHO ARE VETS AT 1,000+ DAIRIES AND THEY TELL ME THE ANIMALS ARE CARED FOR BUT THERE IS NOT THE SAME CONNECTION WITH THE ANIMALS AND FARM THAT THERE IS WITH SMALLER FARMERS. I HAVE 2 FRIENDS WHO HAVE WORKED AT THE SAME 500+ HEAD DAIRY WHO DON'T SHARE ANY "HORROR" STORIES BUT TELL ME ABOUT QUESTIONS THEY HAVE ABOUT THE FARM'S ENVIRONMENTAL IMPACT IN THE REGION I LIVE, SW MN.

THANK YOU FOR LISTENING AND KEEPING AN OPEN MIND. JUST AS EASILY AS I THINK MY CENTRAL POINT IS CLEAR, PERHAPS I'M WRONG. SO, AS YOU READ MY COMMENTS/QUESTIONS BELOW PLEASE UNDERSTAND THAT I'M TRYING TO COME AT IT FROM THE VIEWPOINT OF AN EDUCATOR WHO ASKS QUESTIONS TO INCREASE DISCUSSION/UNDERSTANDING. YES, I COME WITH A BIASED VIEW BUT ALSO I BELIEVE COMPLETE RIGIDITY THAT TRIES TO CLASSIFY THIS COMPLEX SOCIAL QUESTION INTO CLEAR BLACK AND WHITE CLASSIFICATIONS DOESN'T HELP BUILD OUR UNDERSTANDING.

THANKS AGAIN FOR READING. I WILL STEP DOWN FROM MY PEDESTAL NOW...THIS TIME FOR REAL :) 

I DON'T EXPECT ANY RESPONSE OTHER THAN A FORM EMAIL THANKING ME FOR COMMENT. I ONLY EXPECT THAT AS A PUBLIC SERVANT YOU WILL JUST CONSIDER WHAT I OFFER.

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting).
- UHHHHH, REALLY? LOTS OF QUESTIONS HERE. 1) IS THE STANDARD FOR "SAFE DRINKING WATER" REASONABLE? 2) IF IT IS, DOES YOUR OFFICE BELIEVE THIS PROJECT WILL WORSEN THIS SITUATION? WILL IT HELP? I WONDER IF THIS IS A WELL KNOWN FACT AMONGST THE PEOPLE IN THAT REGION. IS IMPACT ON DRINKING WATER PART OF YOUR OFFICE'S CONSIDERATION PROCESS? IF NOT, IS ANY GOVERNMENT ENTITY CHARGED WITH KEEPING ONGOING DATA RELATED TO THE STATISTIC CITED? AM I BEING DUPED HERE I.E. SHOWN A STATISTIC OUT OF CONTEXT THAT TRIES TO RELATE TWO SEEMINGLY RELATED THINGS BUT IS MISLEADING BECAUSE THE TOPIC IS MUCH MORE COMPLEX? This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211). I USUALLY VIEW GOVERNMENT DATA AS MORE RELIABLE THAN SPECIAL INTEREST GROUP DATA BUT DOES YOUR OFFICE HAVE DATA FROM OTHER SOURCES THAT ADDS VALIDITY TO THE CITATION OR CONTRADICTS/ADDS NUANCE THAT WOULD SHAPE MY VIEWPOINT IN A MORE CONTEXTUALLY COMPLETE WAY?

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 OUT of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge REQUIREMENTS. It is difficult for the public, for neighboring farmers, rural residents and township residents to trust that they MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

WHAT?! LOL. HERE I WAS THINKING THAT SOMEONE MIGHT ACTUALLY READ MY DIATRIBE AND CONSIDER MY COMMENTS/QUESTIONS FOR MY INTENT OF GREATER DISCUSSION/DEEPER UNDERSTANDING. I ASSUME, THAT IF THIS STATEMENT IS TRUE AND ACTIVE NONCOMPLIANCE HAS OR IS OCCURRING, IT IS BECAUSE YOUR OFFICE IS SEVERELY UNDERSTAFFED. HOWEVER, IF THAT IS THE CASE, WHAT HAVE YOU DONE TO ADDRESS THIS ISSUE? DID IT WORK? WHY OR WHY NOT? YOUR POSITION'S IMPORTANCE ACCURATELY OR NOT APPEARS TO ME TO BE ONE THAT IS ABSOLUTELY ESSENTIAL TO THE PRESENT AND THE FUTURE SO YOUR OFFICE MUST DO BETTER. I'M GUESSING THE BUREAUCRACY MAY BE GETTING IN ITS OWN WAY BUT HOLY COW! (PUN INTENDED) IN MY VIEW, IF PAST OR PRESENT NONCOMPLIANCE IS ON THE RECORD OF ANY OPERATOR OF ANY SIZE THEIR APPLICATION TO EXPAND SHOULD NOT BE CONSIDERED. EVER. TO ME, THIS IS LIKE THE BAJILLION BACKGROUND CHECKS I'VE COMPLETED AS AN EDUCATOR/VOLUNTEER THAT ASKS ME QUESTIONS ABOUT CRIMINAL HISTORY. ALTHOUGH, OFFICIALLY I BELIEVE CRIMINAL HISTORY ISN'T SUPPOSED TO AUTOMATICALLY DISQUALIFY ME, WE KNOW THAT IT WOULD.

PARDON MY LANGUAGE, BUT THAT TAKES SOME BALLS TO BE NONCOMPLIANT YET BELIEVE EXPANSION SHOULD BE APPROVED BY REGULATORS. EITHER THAT, OR IT SHOULD BE A SIGN THAT THE MPCA IS VIEWED AS COMPLETELY INEPT OR POWERLESS AND SIMPLY A SYMBOLIC SIVE THAT WILL NOT STRAIN OUT THE SUBSTANCE ITS INTENDED TO PROHIBIT. I HOPE THERE IS MORE TO THIS STORY TOO. IF WHAT I JUST READ IS WORTHY OF FACE VALUE, THIS PROJECT SHOULD NOT HAVE GOTTEN TO THIS POINT. I HOPE THERE IS MORE EXPLANATION OR THAT I I'M MISUNDERSTANDING BECAUSE THIS IS UPSETTING.

I WOULD BE WILLING TO LISTEN TO HOW I CAN HELP IF THIS IS TRUE AND YOU WANT TO TAKE STEPS TO CLOSE THIS GASH IN OUR PROTECTION OF MINNESOTA'S ENVIRONMENT.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW.

- YIKES! I'M GETTING UPSET. AGAIN, I HOPE THIS IS NOT THE WHOLE STORY. I WANT TO BELIEVE WE'RE SMART ENOUGH TO AT LEAST CONSIDER THE ROLE OF PESTICIDES (IF THEY ARE GOING TO BE USED) IN THE FARM HEALTH, WORKER HEALTH AND COMMUNITY HEALTH. PESTICIDE USE/MANAGEMENT PRACTICES HAVE MADE EFFICIENT GAINS TO MAXIMIZE PROFIT WHILE MINIMIZING RISK SINCE THE EARLY DAYS (WHICH WEREN'T THAT LONG AGO) OF PESTICIDES. YET, IT IS WIDELY ACCEPTED THAT PESTICIDES IF USED INAPPROPRIATELY, ARE DANGEROUS TO PLANT, SOIL AND PUBLIC HEALTH. SEEMS PRETTY SIMPLE THAT THE APPLICANT SHOULD PRESENT A PLAN PROPOSAL TO MITIGATE OR ELIMINATE THE KNOWN RISKS OF PESTICIDES.

Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. # I HAVEN'T HEARD OF THIS AREA TO BE A "CANCER CLUSTER" BUT IF THAT IS TRUE, WHY ARE YOU STILL CONSIDERING THIS APPLICATION? STRIKE IT DOWN AND USE THE SAVINGS/FUNDS TO ADDRESS THE "CANCER CLUSTER" INSTEAD OF
HASTILY OFFERING AN APPROVAL STAMP THAT QUITE POSSIBLY WILL EXACERBATE ANY NEGATIVES THAT ARE ONGOING.

It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

I FEEL LIKE THIS POINT IS LIKELY MISLEADING. IF IT "STANDS TO REASON" THEN LSP SHOULD WORK TO GATHER ADDITIONAL DATA FROM STUDIES THAT PROVIDES RELIABILITY TO THEIR ASSERTION. ARE THERE PROVEN METHODS THAT ELIMINATE THE THREAT? IF SO, DALEY OUGHT TO OUTLINE HOW THEY WILL IMPLEMENT THOSE METHODS.

- It is not clear from the EAW, how Daley Farms' proposed expansion would improve the quality of life, including the quality of health, for area residents.

- IS THAT ONE OF THE REQUIREMENTS TO GET THE PROJECT APPROVED? IN MY 37 YEARS OF EXPERIENCE IN AGRICULTURE (18 FIRST HAND) THE REST TERTIARY, I AM CONFIDENT THE ONLY POSSIBLE ARGUMENT OF "IMPROVING QUALITY OF LIFE" OR "QUALITY OF HEALTH" CAN BE MADE AROUND JOB CREATION. EVEN MAKING THAT ARGUMENT WOULD BE LAUGHABLE THOUGH. DAIRY FARM WORKERS ARE NOT PAID COMMISERATE TO RISK/GROSS FACTOR. I'VE NEVER HEARD OF A DAIRY FARM WORKER EARNING A WAGE THAT EVEN APPROACHED MEAN OR MEDIAN SALARIES OF A GIVEN MINNESOTA REGION. DAIRY FARM WORKERS IN MY EXPERIENCE ARE SHORT TERM (BECAUSE THE WORK STINKS (LITERALLY AND FIGURATIVELY), IS DANGEROUS TO PHYSICAL HEALTH (ACCIDENTS BUT MORE SO WEAR AND TEAR ON THE BODY, SPECIFICALLY JOINTS AND THE BACK) AND PAYS POORLY. IN MY EXPERIENCE, DAIRY FARM WORKERS COME FROM DISADVANTAGED SOCIAL GROUPS LARGELY. WE HAD MEN WITH CRIMINAL RECORDS WHO COULDN'T GET A JOB ELSEWHERE BE FORCED TO DO THE CRAPPY WORK FOR LESS THAN THEY SHOULD BE PAID/BARELY A LIVING WAGE FOR INDIVIDUALS LET ALONE FAMILIES OR FOREIGN EXCHANGE STUDENTS WERE WERE "PAID" PARTIALLY THROUGH ROOM AND BOARD WHILE "STUDYING AGRICULTURE" IN AMERICA FOR PERIODS OF TIME TYPICALLY LESS THAN A YEAR OR PEOPLE WITHOUT A HIGH SCHOOL DIPLOMA, OR AN FBI CON MAN WHO ENDED UP STEALING TENS OF THOUSANDS OF DOLLARS WORTH OF COINS AND BASEBALL CARDS (WILD BUT TRUE STORY :) PRIOR TO GETTING ROBBED BLIND HE WAS BY FAR THE BEST WORKER WE EVER HAD LOL). BY FAR THOUGH THE WORK ON OUR FARM WAS COMPLETED BY THE KIDS. MY 4 SIBLINGS AND I DID 95% OF THE HARD LABOR.

IS THERE ANY MECHANISM IN THIS PROCESS THAT ALLOWS FOR INPUT FROM YOUTH UNDER 18? IS THERE A SPECIAL CONSIDERATION GIVEN TO CHILDREN RELATED TO THE OWNER WHO ARE LIKELY TO BE FORCED TO PROVIDE FREE OR UNDERPAID LABOR? IS THERE ANY DESIGN IN THE PROCESS FOR YOUTH OF THE COMMUNITY TO PROVIDE INPUT?

ALTHOUGH I REMEMBER BEING MISERABLE AND RESENTFUL OF MY LABOR ON THE FARM GROWING UP, I'VE COME NOW TO REALIZE SOME OF THE REASONS I HAD FOR RESENTMENT WERE BEYOND MY UNDERSTANDING AT THE TIME. STILL, I REMEMBER IT BEING MISERABLE.

AS FAR AS PUBLIC HEALTH BENEFIT, THEY COULD PLAY THE "MILK PRODUCTS ARE GOOD FOR YOU AND VERSATILE FOR THE MINNESOTA DIET" HOWEVER THERE IS NO POSSIBLE PUBLIC HEALTH BENEFIT TO THE COMMUNITY WHERE THE PROPOSED LOCATION IS. ONLY NEGATIVE PUBLIC HEALTH IMPACTS CAN RESULT. I REALLY HOPE THE PEOPLE OF THE LEWISTON AREA ARE ASKING QUESTIONS AND COMMENTING TOO BECAUSE IF THIS PROJECT IS APPROVED IT WILL NEGATIVELY AFFECT THEIR DAILY LIFE.

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area.

- I'M NOT SURE WHAT "HIGH-RISK KARST AREA" MEANS BUT I DO KNOW THAT PART OF SOUTHEAST MINNESOTA'S BEAUTY IS FORMED BY THE LIMESTONE WHICH ALLOWS FOR SOME AWESOME CAVES. WHAT HAPPENS IF THE MANURE PIT FAILS? ARE YOU SURE IT WON'T? IS THERE ANY WAY TO BE SURE OR IS IT JUST A THRESHOLD HOLD OF "MOST LIKELY NOT"

What was learned from these collapses that can be applied to safe construction and utilization of manure pits? Does the Daley project include evidence that demonstrates new knowledge that was gained from these failures?

After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

How would a catastrophic, medium, small failure impact the tourism of the area? Is the estimated financial impact of Daley Farms even positive? If so, would it outweigh the cost of income lost in other areas of their local economy?

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year.

How does your water come from? Do you confidently know how much water is there? Can any water be recycled? How is 92 million gallons estimate calculated? Are you fully aware of the intricacies of water shortages found in other parts of our country? When you start messing with your own water supply I know that it will result in community ending catastrophe. No water, no community. Are you positive that is not a possibility?

The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

Dear God. How many government entities need to raise red flags? I sincerely hope that I’m being naive or LSP is lying or deliberately misleading because from what I’ve read to this point makes me feel like the only reason this is still an issue is because of the money being thrust forth by Big Ag as they try to ramrod a shit sandwich down the throats of my fellow Minnesotans.

The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400’ X 400’ X 16’ manure pit were to be constructed.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Please prioritize safe water

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

Hadn’t thought about this yet but that would be one way a medium to large size catastrophe could cause millions or billions of dollars of harm to other sectors of their regional economy.

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community.

Someone with more thorough knowledge of the often opaque industry may be able to articulate why people believe big dairies are bad for rural communities but I know first hand that Minnesota farmers from areas all around the state point to big dairies as a major part of the failing dairy industry for small farms with a direct and active negative impact on rural Minnesota.
and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

- HONESTLY, I WANTED TO OFFER MY 2 CENTS BECAUSE AS I SAID AT THE OUTSET THE BIAS I HAD REGARDING THIS PROJECT BECAUSE I CARE ABOUT RURAL COMMUNITIES AND RURAL MINNESOTA, GREW UP ON A DAIRY FARM, AND HAD MANY CONVERSATIONS RECENTLY WITH DAIRY FARMERS FROM AROUND THE STATE. I ENDDED UP INVESTING MORE TIME THAN I THOUGHT BECAUSE AS I READ LSP’S FORM LETTER IT INCREASINGLY SEEMED TO ME THAT COMMON SENSE, RULE OF LAW, AND THE COMMON GOOD IS LOSING OUT TO A FORCE MORE POWERFUL AND DETRIMENTAL TO MY FELLOW MINNESOTANS. I WOULD BE INTERESTED IN HEARING WHAT THE DALEY PROJECT’S VIEW IS ON SOME OF THE KEY ISSUES. LIKE I SAID AT THE BEGINNING, I’VE FOUND LSP STAFF AND MEMBERS TO BE GREAT PEOPLE. HOWEVER, I UNDERSTAND IT IS AN INTEREST GROUP AND AIMS TO ADVANCE THEIR CAUSE. PERSONALLY, IT IS A CAUSE I THINK IS WORTHY BUT IN THE DEMOCRACY THAT IS BEING PRACTICED TODAY IT SEEMS THAT THE ONLY VOICES HEARD ARE THOSE OF INTEREST GROUPS; NOT CITIZENS. SO BEFORE I SENT YOU A FORM LETTER, I WANTED TO AT LEAST SHARE A BIT OF MY STORY SO YOU KNEW IT CAME FROM A REAL PERSON. WHEN I STARTED, I HONESTLY THOUGHT “MEH, THAT’S A LONG WAYS AWAY”. HOWEVER, AS I READ I KEPT FEELING MORE AND MORE INCREDULOUS. MAYBE LSP IS MISLEADING ME. IF THEY AREN’T, THEN I HOPE YOU CAN GIVE THE CITIZENS OF THE LEWISTON AREA AND IN PROXY THE REST OF US HEARTY MINNESOTANS THE Equivalent OF TWIN HEIFER CALVES. I FEAR THAT BIG AG IS YIELDING THE POWER OF THE PURSE TO SUPRISE MN CITIZENS WITH A PAUL BUNYAN SIZED MANURE PIT FILLED WITH SUDDEN STUPIDITY, ENDURING CONSEQUENCES AND BOUNTIFUL BULLSHIT.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County’s ordinance states: “No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site.” The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was “grandfathered in.” This means it could continue, but not expand. The county ordinance states: “No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity.”

- WE KNOW HOW THIS PORTION ENDS…DALEY GETS THE COUNTY ORDINANCES COME STEAMING COW PIES OR GOD FORBID HIGH WATER THAT TAKES A BAD IDEA AND TURNS IT INTO AN ENVIRONMENTAL CALAMITY THAT LEAVES UNSUSPECTING CITIZENS HOLDING THE PITCHFORK WHILE THE MANURE PIT CATALYSTS ESCAPED OUT THE BACK BARN DOOR.

I ENCOURAGE YOU TO APPLY THE VALUES I’VE LEARNED FROM SOME OF THE PEOPLE WHO MAKE UP THE MAJORITY OF DAIRY PRODUCERS IN MINNESOTA. DO IT RIGHT OR DON’T DO IT AT ALL. BE COUNTED, EVEN IF YOU STAND ALONE. MAKE CHOICES THAT BENEFIT YOUR COMMUNITY NOT JUST YOUR BANK ACCOUNT. ENDURE PAIN AND STRESS TODAY IF IT MEANS A BETTER OUTCOME FOR TOMORROW. CHECK YOUR FENCES, IT’S EASIER THAN CHASING COWS IN THE CORN. TREAT YOUR STOCK AS FAMILY OR AS DAIRY FARMERS OFTEN DO, A LITTLE BETTER. TODAY’S DIFFICULT DECISION UNDER PRESSURE FROM MULTIPLE FRONTS SHOULD BE GUIDED BY YOUR COMPASS THAT HAS BEEN REFINED THROUGH THE PERSISTENT NOSE TO THE GRINDSTONE OF COMMON SENSE, COMMUNITY STRENGTHENING AND THE RELIABLE OL SMELL TEST.

THANK YOU SO MUCH FOR READING AND EVEN MORE IF YOU GAVE MY COMMENTS/QUESTIONS ANY THOUGHT. GOOD LUCK! IF I CAN HELP, PLEASE REACH OUT TO ME VIA TEXT OR EMAIL.

SINCERELY,

GRANT WILL
grantwill10@gmail.com
507-401-1214

Sincerely,

Grant Will
113 E St
Marshall, MN 56258-2511
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state.

No dairy farm "needs" to be this big, generating a huge amount of manure that threatens to pollute the groundwater that serves as a drinking water source for many. The geology of the area makes groundwater contamination from nitrates a very real possibility.

In addition to polluting the groundwater, the actual quantity of water required by such a large operation is staggering, which is an additional threat to that common water source needed to support the general population.

There seems to be no benefit to the area residents in granting an expansion; just the opposite: this poses significant threats to the quality and sustainability of the community.

An Environmental Impact Statement is needed to evaluate the economic impact which an expanded operation would have on neighboring farms and the rural community; the impacts to roads must be addressed, in addition to assessing the previously mentioned quantity of water use and potential degradation of groundwater by the spreading of manure.

Please note that Winona County's ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The Daley operation was grandfathered in; it is already larger than the permitted limit. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity." The MPCA should not even be considering a permit that would further expand an operation already larger than what the county would normally permit and which poses a significant threat, through excessive use and potential contamination, of a water source shared by many and necessary to sustaining the quality of life in the area.

Sincerely,
Susan Darley-Hill

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Susan Darley-Hill
1710 E. 7th St.
Duluth, MN 55812
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The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult for the public, for neighboring farmers, rural residents and township residents to trust that the MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

It is not clear from the EAW, how Daley Farms' proposed expansion would improve the quality of life, including the quality of health, for area residents.

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.
The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events—since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

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Sincerely,

Jennifer Therkielsen
19715 Grandview Dr
Park Rapids, MN 56470-5315
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Sincerely,

Mary Melbo
2950 Dean Pkwy
Minneapolis, MN 55416
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For 25 years, I served as the director of the Office for Social Concerns & Family Life, for the Diocese of New Ulm. The diocese encompasses a fifteen county area of Minnesota, almost co-extensive with the MN River Basin, and much of its land is devoted to agricultural production. During my tenure in the diocese, I became increasingly aware of the dangers that large livestock confinement operations posed to water and air quality, human health, and the viability of modest-scale family farms.

Please do everything you can to protect human health, our water and air resources, and truly sustainable family farm operations.

Sincerely,

Christopher Loetscher
415 N. German Street
New Ulm, MN 56073
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Sincerely,

Merry Sawdey
30844 56th Avenue Way
Cannon Falls, MN 55009
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Sincerely,

Virginia Mackay
2697 Riviera Dr S
White Bear Lake, MN 55110-4923
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Bonnie Beckel
3519 23rd Ave S
Minneapolis, MN 55407-2440
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Keith Johnson
340 N Minnesota St Apt 108
Muscoda, WI 53573-9496
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Sally Vogel
19429 US Highway 218
Austin, MN 55912-5867
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com>  On Behalf Of christinaschmitt6@gmail.com

Sent: Friday, November 02, 2018 12:25 PM

To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>

Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Christina Schmitt
3140 43rd Ave. S.
Minneapolis, MN 55406
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I feel karst landscape has suffered enough from the impact of ag. And being that the Daley Farm seems to have a problem with being in compliance now with Federal requirements. What would guarantee that they would be responsible to operate safely? There is way too much to risk with a environmental disaster. Please do what is correct with the dissection not just for the impact to the environment but our future generation’s.

Sincerely,

Bruce Gockowski
PO Box 36
Wyoming, MN 55092-0036
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629 S. Front St.
Mankato, MN 56001
Dear Ms. Grosenheider,

My husband and I live on a farm in Winona County and are very concerned about the proposed huge expansion of the Daley Farm. In years past, our farm operated as a small dairy farm with about 40 cows. I do believe that a farm of this size would be driven out of business today by farms such as the Daley’s. We also have two wells on the property that even now have a high chance of contamination.

It seems that regulations were put in place for a reason. Some laws, such as the bluff-top regulations, have had a negative impact on the value of our ag land but we do understand that you cannot change the will of the majority just because it impacts your ability to make a profit.

The Daley family may be fine people but their insistence to forge ahead and overturn a very sensible regulation seems another case of the “big guys” ability to pay the legal fees that this kind of opposition to the law requires. Please do not allow this expansion to go forward.

Thank you,
Lynn Nankivil
2490 Garvin Heights Road
Winona MN 55987
Dear Ms Grosenheider:

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Sincerely,

Shirley Espeland
2250 Luther Place
St. Paul, MN 55108
Dear Ms Grosenheider:

Please stand strongly to uphold the Winona County ordinance against allowing expansion of feedlots beyond 1500 head of cattle. The risks to the future health of the region are extremely high. See details below:

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Barbara Prokop
6580 Glen Rd Woodbury, MN
Saint Paul, MN 55129-9503
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Bonita Schwartz
13376 Elaine ct
Savage, MN 55378-2457
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Michael Haldeman
2616 W 4th St
Duluth, MN 55806
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3193 Strand Rd
Duluth, MN 55803-9795
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1213 County Road 2 S
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C. John Hildebrand
1212 Powderhorn Ter Apt 304
Minneapolis, MN 55407-1646
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Michelle Gobely
1581 Wheelock Ln Apt 202
Saint Paul, MN 55117-5965
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Appleton, MN 56208-1666
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1908 1st Avenue NW
Austin, MN 55912
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When there are so many cows, it makes it impossible to allow them to be grass-fed and be raised in a sustainable way. Bigger is not better. Thanks for listening!

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Joyce Genis
2817 W 97th St
Bloomington, MN 55431-2421
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The impacts of this project affect public resources, the economy, and our environment. Pushing it through just to satisfy the individual farm owners does a disservice to local citizens’ concerns. An EIS is the proper way to move forward on this issue.

Sincerely,

Laura Frerichs
23229 200th St.
Hutchinson, MN 55350
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We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

It is not clear from the EAW, how Daley Farms' proposed expansion would improve the quality of life, including the quality of health, for area residents.

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.
The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events—since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation ([https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html](https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html)).

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County’s ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

John White
5655 County Road 10
Chaska, MN 55318-9228
-----Original Message-----
From: Ruth Bures <rebures@yahoo.com>
Sent: Friday, November 02, 2018 8:44 AM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Expansion of Factory Farms

Please require an Environmental Impact Statement for the Daley farm expansion. We must protect our water and land and other natural resources, not destroy or imperil them.

Thank you.
Ruth Bures
224 Lake Park Drive
Winona, MN 55987
507-452-2505
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

The EAW indicates that this factory farm expansion will generate 46 million gallons of liquid manure annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order the completion of an Environmental Impact Statement (EIS).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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Sincerely,

Sharon Schmidt
4462 W 132nd
Savage, MN 55378
Comment Sheet
Proposed Daley Farms expansion
Environmental Assessment Worksheet
and Individual Feedlot Permit Coverage

Your comments!
If you would like to comment on the Environmental Assessment Worksheet (EAW) and Individual Feedlot Permit for Daley Farms' proposed dairy expansion in Winona County, Minnesota, please use this form and mail it to: Kim Grosenheider, MPCA, 520 Lafayette Road N., St. Paul, MN 55155. You may also submit comments online: http://survey.mn.gov/s.asp?k=153730433478. Written comments must be received by 4:30 p.m. Oct. 31, 2018.

I would like to express my solid support for the Daley Farms expansion. My relationship is both personal and professional for the last 44 years in Winona County and Lewiston, Minnesota. My credentials on the business side are listed below.

Owner: Lewiston Feed & Produce
P.O. Box 309
Lewiston, Minnesota 55952

Position: Agronomist
Certified Crop Advisor #10755 (Cover)

(For additional space, continue on backside of this sheet.)

| Name (Required. Please print.) | Michael E KANZ |
| Address (Required. Please print.) | 340 Williams Street Lewiston MN 55952 |
The Daley farm organization has been a leader in Environmental Respect in our community and I am truly proud of the relationship we have had over these many years. In my professional opinion their farming practices have always been Exceptional in every sector of their farming operation. I do not think EI is needed for this expansion. My personal opinion of the Daley Family is best expressed by saying I wish I had more neighbors with common concern of our community and a true belief that family & Friends come first. It's been great knowing this family.
October 31, 2018

Ms. Kim Grosenhaider
Resource Mgmt. and Assistance Div.
MPCA
520 Lafayette Rd N
St. Paul, MN 55155

RE:  EAW -Daley Farms of Lewiston, LLP - 2018 Dairy Expansion
     T106 R9 S16 NE
     Utica Twp., Winona County
     SHPO Number: 2019-0037

Dear Ms. Grosenhaider:

Thank you for providing this office with a copy of the Environmental Assessment Worksheet (EAW) for the above-referenced project.

Based on our review of the project information, we conclude that there are no properties listed in the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36 CFR § 800. If this project is considered for federal financial assistance, or requires a federal permit or license, then review and consultation with our office will need to be initiated by the lead federal agency. Be advised that comments and recommendations provided by our office for this state-level review may differ from findings and determinations made by the federal agency as part of review and consultation under Section 106.

Please contact our Environmental Review Program at (651) 201-3285 if you have any questions regarding our review of this project.

Sincerely,

Sarah J. Beimers
Environmental Review Program Manager
Comment Sheet
Proposed Daley Farms expansion
Environmental Assessment Worksheet and Individual Feedlot Permit Coverage

Your comments!
If you would like to comment on the Environmental Assessment Worksheet (EAW) and Individual Feedlot Permit for Daley Farms’ proposed dairy expansion in Winona County, Minnesota, please use this form and mail it to:
Kim Grosenheimer, MPCA, 520 Lafayette Road N., St. Paul, MN 55155. You may also submit comments online:

Please— is it really necessary to even consider this huge unlawful expansion?
We have RULES for society — for the greater protection of our health, our cities and our environment.
We continue to poison our Home (Planet) and glorify the supposed almighty dollar!
Wake up — as the band REM sang — “It’s the end of the world as we know it”
Mark Twain said: “Do the right thing — it will gratify some people and astonish the rest”

(For additional space, continue on backside of this sheet.)

Name (Required. Please print.)

Donn Seitz

Address (Required. Please print.)

706 West Wabasha St.
Winona, MN 55987

Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194
(651) 296-6300, toll-free (800) 657-3864, TTY (651) 282-5332 or (800) 657-3864
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Printed on recycled paper containing at least 30 percent fibers from paper recycled by consumers.
Comment Sheet
Proposed Daley Farms expansion
Environmental Assessment Worksheet
and Individual Feedlot Permit Coverage

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My husband, Richard, and I urge the MPCA to require an EIS for the proposed Daley Farms’ dairy expansion. In the media and in a prepared written statement, the Deelys referenced their opposing their expansion as “fear mongers.” Indeed we are and we believe justifiably so.

We own two parcels of land, both within a mile of the Deely facility. The land is leased to an organic farm family. We homestead on one of three parcels. We have municipal water and sewer services and a well on premise.

This is an account of our water woes.

(For additional space, continue on backside of this sheet.)

| Name (Required. Please print.) | Karen M. Ahrens |
| Address (Required. Please print.) | 200 West Main Street, Lewiston, MN 55952 |

Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194
(651) 296-6300, toll-free (800) 657-3864, TTY (651) 282-5332 or (800) 657-3864
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For at least 10 years we purchased bottled water for drinking and cooking because of Public Notice that read "Our water system recently violated a drinking water standard." The notice were included in our water bills and printed in our official city newspaper. We took this action because we were fearful for our health safety.

We had reason to believe that because we are at the end of a waterline that pollutants, chemicals used to treat them and mineral deposits were pooling right here. Water tests proved that our assumptions were true.

For years we sought advice to improve our water quality. Beginning with the city council and public works we also conferred with city engineers below. After working with infrastructure repairs, Environmental Health, Drinking Water Hotline, the Attorney General, MPCA and the Federal EPA. We referred us back to our municipal water supplier, the city of Lewiston.

Meanwhile we continued to pay a high water bill (about $80 per month) for water that we couldn't drink, cook with or launder our clothes.

We prayed for our health and that of our neighbors.

We took measures to combat our problem. At the advice of public works we replaced old pipes disconnecting our front yard, burrowing through our treatment center flows. It was a costly venture with no water improvement.

We installed a whole house water filter.

Housekeeping to take care of uncleanly mud was never ending. We were impacted by cost, odor and damage to our belongings.

We were hired by the battle after a seemingly endless struggle the city took action and looped our water line one week ago. The service came with a 28% tap levy.

As we think any wonder why we are fearful of the massive Delia field expansion. I wish that we were all "Fear mongers" doing everything we can to preserve our precious water resource. Our lives depend on it.

THANK YOU FOR YOUR CAREFUL CONSIDERATION.

Karen M. Ahrens
Comment Sheet
Proposed Daley Farms expansion
Environmental Assessment Worksheet and Individual Feedlot Permit Coverage

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I am requesting that an Environmental Impact Statement be done for the proposed Daley Farm expansion. I have lived and farmed just over a mile from the Daley Farms for 70 years. I've witnessed the changes in farming practices and changing landscape.

We live in a very vulnerable topography. Just north of Lewiston is an area known as Rupprecht's Valley. In that valley is a series of caves, caves large enough to walk into. As a Scoutmaster in Lewiston, I would take my Boy Scouts there. We studied the topography of the area. We learned from the late John Michael, who worked for the Conservation Service in Lewiston, that these caves are in a line that extends along State Highway 14 to Dover MN (about 15 miles)

(For additional space, continue on backside of this sheet.)

Name (Required. Please print.)

| Richard E. Ahrens |

Address (Required. Please print.)

| 200 West Main Street |
| Lewiston, MN 55952 |

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away). These underground caverns extend right through the Daley farms.

Because of our Karst topography, water seeps into the caverns and to the ground water. When the water seeps in, it often forms a sinkhole. Numerous sink holes can be seen from Highway 14. Our farm is also on the line of caverns. Fortunately I have no sinkholes, but my neighbors do. They have dumped junk/garbage/ dead animals in them for as long as I can remember. When the Lewiston Elevator burned the rubble was dumped into a sinkhole and covered with soil. This caused all the neighboring wells to go bad.

In 2007 following a heavy rain, three sinkholes opened in a cow yard on the corner of Hwy 14 and CR 33. This can happen anytime. Should this happen at the Daley farm it would be catastrophic for the city of Lewiston and surrounding area.

I can remember when our city water was pure, no pollutants. As a city council member we tried to get a water filtration system to treat our ailing water but it was too costly. Today we drink bottled water.

The Daleys are presently operating non-compliant feedlots. I realize it is not possible to police all these farms. Now is the time for you to step forward and make the right judgment for the common good.

I would be glad to point out these sinkholes to you if you’d like. Thank you.

Richard E. Olsen
Comment Sheet  
Proposed Daley Farms expansion  
Environmental Assessment Worksheet  
and Individual Feedlot Permit Coverage

Your comments!

If you would like to comment on the Environmental Assessment Worksheet (EAW) and Individual Feedlot Permit for Daley Farms' proposed dairy expansion in Winona County, Minnesota, please use this form and mail it to:  
Kiri Grosenheider, MPCA, 520 Lafayette Road N., St. Paul, MN 55155. You may also submit comments online:  
Nov. 15

Taxpayers pay to have experts collect the data needed to  
protect us. To ignore the facts and in turn allow  
individuals to endanger our environment for  
profit (to a few) is actually illegal. The limits are on  
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random changes because a project has been planned.  
If big money wins this fight we will all feel the effects  
eventually. Those responsible have to face their abuse.

(For additional space, continue on backside of this sheet.)

| Name (Required. Please print.) | Reva Seitz |
| Address (Required. Please print.) | 700 W. 7th St.  |
|                                | Winona, MN  |
|                                | 55987  |

Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194  
(651) 296-6300, toll-free (800) 657-3864, TTY (651) 282-5332 or (800) 657-3864  
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Taxpayers pay to have experts collect the data needed to protect us. To ignore the facts and in turn allow individuals to endanger our environment for profit (to a few) is actually illegal. The limits are on record for a reason. This is a totally unnecessary variance. It is not the citizen's right. Water quality is sacred and we expect compliance not random changes because a project has been planned. If big money wins this fight we will all feel the effects eventually. Those responsible have to face their abuse.

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| Name (Required. Please print.) | Reva Seitz |
| Address (Required. Please print.) | 700 W. 7th St.  
Winona, MN  55987 |
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Dear Ms Grosenheider:

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The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

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We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

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Sincerely,

Merry Sawdey
30844 56th Avenue Way
Cannon Falls, MN 55009
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of nheidinger@thenationalartsclub.org
Sent: Tuesday, November 13, 2018 8:17 AM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Sincerely,

Nadine Heidinger
15 Gramercy Park S
New York, NY 10003-1705
Dear Ms Grosenheider:

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Sincerely,

Kelly Karstad
1011 Willow Drive
Saint Peter, MN 56082
Dear Ms Grosenheider:

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Sincerely,

Bridget Levin
4201 Fremont Avenue South
Minneapolis, MN 55409
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Sincerely,

Kurt Schulz
9364 160th St.
Glencoe, MN 55336
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This trend towards large farms, whether cows, hogs, turkeys or any other animal, does not help farmers, our water system or land. We need to protect our resources and rethink allowing corporations to produce our food without care to the environment,

Sincerely,

Bonita Schwartz
13376 Elaine ct
Savage, MN 55378-2457
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The costs to clean water is significantly more expensive than to keep it clean.

Sincerely,

nancy m palmer
12470 Camwood trail
Baxter, MN 56425
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of barbwired2n@hotmail.com
Sent: Tuesday, November 13, 2018 8:05 AM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Sincerely,

Barbara Norblom
1705 Stevens Avenue
Minneapolis, MN 55403
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Sincerely,

Sarah Simpson
132 4th Ave SE
Spring Grove, MN 55974
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Sincerely,

Kelly Kirkpatrick
1115 East Center Street
Rochester, MN 55904
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Jacquelyn Warren
189 Spruce Drive
Apple Valley, MN 55124
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Let's also consider that big, factory-run agriculture is not what Minnesotans want right now. The movement towards sustainable, local, small, organic farming run by ethical farmers who care about the community has been growing in strength and affordability for years now. We need to think long-term. We need not only to live off of this planet, but ensure it will continue to support us and generations after us. Decisions like this, allowing this farm to expand without investigating environmental disaster potential, without their other corporate farms even being pollution compliant, is deeply irresponsible. Please show integrity and responsibility by thoroughly investigating the environmental impact of this corporate factory farm.

Sincerely,

Kelsey Koch
8825 Oakland Ave s
Minneapolis, MN 55420-3033
Daley farm extension Nov. 12 2018
As a farmer near Lewiston, Minnesota I do not agree of their dairy expansion. We live in an area where bad water and bad manure can reach our ground water supply very fast. So dumping huge amounts of raw gassy manure is not for this south east farming area.

When another farm comes up for sale, guess what---they out bid ever one and this is not for a new start up farmer. Our ground water is saturated already with nitrates already, deadly for the young children. Allowing for their expansion will only make matters worse.

Minnesota needs leader ship who will stand up against poising our water supply. It appears to me this is a case of democracy verses dictatorship. This is a very busy season for our farmers to attend meetings and as I see it was planned that way. The timing for hearings could of been in January when farmers have time to attend meeting. Thess hearings must not of been held in this harvesting season. This allowed very little out put from farmers. Who ever planned this should be put to shame. It is disgraceful at the highest level.

Minnesota needs new young farmers not giant ones. Giant farms in Russia failed, why are you following a failed system anyway. Now frac sand comes into play. These huge trucks have destroyed Winona County Road 113, if you don't believe me check it out for yourself.

About factory farms, dairy, turkey, pork and chickens. None of these unit farm animals are on open range and sunshine. This is a sin against God, he created a beautiful world and man is destroying every part of it just for greed. A test you must do, buy some factory farm pork spare ribs at the grocery store. All you officials go to one of your friends. The wife in this house will add only water (not salt, spices etc) start to cook this pork and you will stink yourselves out of the house, don't believe me, just do it. Please send me a letter if I am lying. Lastly but not least is all factory farm food is poison to us humans. America has see an explosion of deformed children about the time of glyphosate (roundup) introduction for weed killing. Their genes are being altered. Don't believe me, check out just one of these childrens hospitals. You see them every day asking for donations on TV.

My friends, please help save our children. They are products of factory farms.

signed James Pelowski 31071 County Road Utica, Minnesota 55979 ph 1-507-932-4665
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19 Bell Circle
Silver Bay, MN 55614
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Annette McGinley
18037 Miller Dr
Park Rapids, MN 56470
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Leslie Stewart
603 Dunn St
Pepin, WI 54759
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Cathy Witthoeft
100 Probstfield St.
Georgetown, MN 56546
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Janette Dean
103 N. Gjere Avenue, #5
Caledonia, MN 55921
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Gail Bromenschenkel
43029 E Elysian Lake Rd
Janesville, MN 56048
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Karen Nielsen
5408 100th ave
clear lake, MN 55319
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27979 County Road 17
Winona, MN 55987
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1002 BUSH ST
RED WING, MN 55066
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Saint Paul, MN 55102
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Sincerely,

Allen Larson
3408 Beauty Lake Rd SW
Pillager, MN 56473
Dear Ms Grosenheider:

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Sincerely,

Elizabeth Merz
111 W Lincoln Ave, Apt 305
FERGUS FALLS, MN 56537
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400’ X 400’ X 16’ manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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Sincerely,

Peggy Endres
943 Wilder St S
Saint Paul, MN 55116-2026
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

The EAW indicates that this factory farm expansion will generate 46 million gallons of liquid manure annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order the completion of an Environmental Impact Statement (EIS).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

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Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County’s ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

Jeremy Wales
316 Alexandria St, P.O. Box 173
Evansville, MN 56326
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

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Sincerely,

Julie Rettig
942 main st
Breckenridge, MN 56520
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With climate change accelerating, the last thing we need is a massive dairy farm with huge manure waste. And more people are going vegan, so cow's milk is on the decline. Please don't allow this expansion.

Sincerely,

Patricia Loverink
403 19th St NE
Austin, MN 55912
Dear Ms Grosenheider:

It’s too dangerous to site this factory on such porous earth. To proceed with the permitting is irresponsible.

Sincerely,

John Reynolds
26385 County Road 3
Merrifield MN, MN 56465
Dear Ms Grosenheider:

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Sincerely,

Christine Harshman
30303 Abby Road Northeast
North Branch, MN 55056
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Sincerely,

Scott Olson
515 Birch Ave
Alexandria, MN 56308-8510
Dear Ms Grosenheider:

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Sincerely,

Renee Walz
1221 Gilmore Valley Road
Winona, MN 55987
Dear Ms Grosenheider:

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What precedent is set for permitting a further increase of animal units without an EIS for a large-scale high density feedlot (and its manure application sites) already 'grandfathered in" beyond a county's allowed animal units? How many more similar "grandfathered in" large-scale concentrated feedlots would this allow in southeast (and the rest of) Minnesota to further expand in the future without requiring an EIS based on this precedent? We cannot know the social and economic impacts of expanding a large-scale high density feedlot without doing an EIS. Social and economic impacts on the affected communities must be studied to ensure the communities remain livable so people are not forced to decide between "putting up" with, or moving away from, the negative aspects of a large-scale high density feedlot and its manure application sites. People in the vicinity of such a feedlot and its manure application sites are left with great uncertainty to questions such as: what they should spend on maintaining or improving their properties, whether they should buy a property in the area impacted by a large-scale high density feedlot, and what costs they could incur if they have to dig a new well. People in "the country" as well as in our towns (and cities) are affected by nearby large-scale high density feedlots and their manure application sites. The social and economic impacts for the future of the affected region need to be studied through an EIS.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

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Sincerely,

Kristine Hall
301 Falcon Drive
Mankato, MN 56001
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If existing, smaller, facilities are non compliant there should be no allowance of opening a new facility, especially of this size, until others are brought into compliance. Furthermore the size of this facility and associated environmental degradation is in a sensitive area where groundwater, among other resources, can be negatively affected. With nitrate levels where they currently are this would be a move for large factory farming and not the people of Greater Minnesota.

Sincerely,

Rhyan Schicker
821 3rd ave madison mn
Madison, MN 56256-1013
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. I want you to know that I have some experience living near factory farms, that I live in the country now on an old farmstead, and am not sending in the quoted comments below lightly or without thought. An increase in scope proposed by the Daley farms radically increases environmental and health risks to neighbors and neighboring communities. A detailed study of potential consequences needs to be done; you cannot just 'see what happens.' It's time to be responsible to people, first, business second.

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Dan Hooley
14241 205th St. N.
Scandia, MN 55073
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Gail Bradford
16033 County Road 44
South Haven, MN 55382
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Cheryl Peterson
1640 Gray Fox Dr NE
Owatonna, MN 55060
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Sincerely,

Danielle Hernandez
2506 18 1/2 Ave NW
Rochester, MN 55901
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Dawn Pesicka
3200 S Terry Ave
Sioux Falls, SD 57106
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33278 state hwy 25
Green isle, MN 55338
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Tina Gronquist
3000 Lincoln St NE
Minneapolis, MN 55418
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Given that the United States currently has a surplus of milk, cheese and other dairy products, it makes no sense to take the risks outlined above to produce more! Only dairy subsidies keep farmers producing milk now. Please vote against allowing this dangerous factory farm to expand further!

Barbara Courneya
Pine River, Minnesota
218-947-3568
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of potra001@umn.edu
Sent: Friday, November 09, 2018 12:21 PM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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1104 15th Avenue SE
Minneapolis, MN 55414
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1539 Pheasantwood Trail
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316 Alexandria St, P.O. Box 173
Evansville, MN 56326
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Sincerely,

Nora Moore
481 Laurel ave
St paul, MN 55102
Dear Ms Grosenheider:

I personally own a 150 acres farm in Pierce County, Wisconsin and I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County.

I was surprised to see the proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

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Joshua Howe
2202 Parklands Lane
Minneapolis, MN 55416
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Sincerely,

Judy Brommerich
22878 Pleasant Ridge Rd
Winona, MN 55987-5720
Ms. Grosenheider, I urge you to do an EIS on the Daley Farms expansion. My concern is much too much water usage. This water needs to be used for the people that live in the area not just for one farm. Another huge concern is the huge amount of manure that will be stored over karst land. It will probably leak into the ground water. It has happened before. People have the right to have clean water! Common sense tells us that we need an EIS done on this expansion. Thanks you, Karen Swanson Lanesboro MN
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Melissa Gordon
1078 W. Broadway
Winona, MN 55987
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Sincerely,

Lois Kozlowski
12619 Twp Rd 106
Mount Perry, OH 43760
Dear Ms Grosenheider:

I hope the government will do its job and execute due diligence in the most thorough possible review of this proposal. CLEARLY, the potential for danger exists--I believe it is guaranteed--and it is upsetting for me to think about the MPCA opting out of an EIS. The MPCA needs to protect the citizens of Winona County as fully as it is willing to protect the interests of this mega "family" farm.

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Lynnea Pfohl
25932 County Road 9
Winona, MN 55987
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Anne Wildenborg
903 Burton St
Red Wing, MN 55066
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Sincerely,

stuart malanaphy
N7375 910th St.
Riverfalls, WI 54022
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Also, This is inhumane for the animals. Although cows are herd animals, they suffer from overcrowding and will be stressed by the level of noise and activity that would exist in such a huge group of thousands of cows.

Sincerely,

Sheila Maybanks
201 Bayberry Avenue Court
Stillwater, MN 55082
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. I am very concerned about the proposed expansion of 3,000 cows, which would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

One concern is the waste that this expanded operation will produce, particularly because it is in an area with karst geology. This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16’ manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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Sincerely,

Cecily Brown  
2232 Minneapolis Avenue  
Minneapolis, MN 55406
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of mhvlazny@charter.net
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Sincerely,

Mary Vlazny
2201 3rd Ave SW
Rochester, MN 55902
Dear Ms Grosenheider:

My comments about the Daley Farms project in Winona County are supported by the clear and undeniable facts presented below. My comment is a request for an EIS or an immediate denial of permits. The facts presented here make it crystal clear that the impact of these farms is disastrous at best. Please consider if you, your children or grandchildren lived nearby. The depression and illness caused by the pollution of air, water and soil would be insurmountable. And we are not talking of only decades. The long-term consequences will last generations and centuries. For what gain? Millions of dollars in the hands of the very few who have already proven that they are irresponsible and a relative few pennies in the hands of a few locals and County coffers. Smaller farms have been shown to be more efficient, sustainable, responsible and they keep the profits more local. Do what is right, smart and responsible. There is enough information to deny this immediately but if you must, show the facts with a required EIS. Sharon Kutter
Grey Eagle MN

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10917 County 47
Grey Eagle MN, MN 56336
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Do the right thing not only for this present moment in time but for the sanctity of life for future generations.

Sincerely,

Nancy Sogabe-Engelmayer  
2371 Nebraska Avenue East  
Maplewood, MN 55119
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Sincerely,

Curtis Speck
15877 560 lane
Good Thunder, MN 56037
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I have lived in southeaster Minnesota of nearly 70 years. I drove by the farm I grew up near Caledonia. Our closet neighbor is a 4th generation farmer and has never cost damage to the neighbors. The Daily expansions is dagerouus in this area. Please do an assessment that looks at sink holes and damage that can never be replaced.

Sharon Keefe Ormsby

Sincerely,

Sharon Ormsby
32063 Wiscoy Co-op Ln
Winona, MN 55987
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Lynne Anderson
211 Dewey Street
Jackson, MN 56143
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Sincerely,

Vernon Crowson
28247 state hwy 30
Chatfield, MN 55923
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Richard Morris
613 4th Ave SE
Rochester, MN 55904
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Sincerely,

Stewart Day
310 N. Grant St.
Minneota, MN 56264
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Sincerely,

Mary Melbo
2950 Dean Pkwy
Minneapolis, MN 55416
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of northernapiaries@gmail.com
Sent: Tuesday, November 13, 2018 11:33 AM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Mark Roalson
518 Coventry Road
Hoyt Lakes, MN 55750
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Minnesota is known for its water resources. You are supposed to protect them. PLEASE don't let big business take over yet another of our resources and ruin our environment. The almighty dollar should never be the main consideration, but it seems like it always is. Shame!

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Wendy Hagen
1322 Frank Hall Dr
Albert Lea, MN 56007-3138
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Sincerely,

Michelle Gobely
1581 Wheelock Ln Apt 202
Saint Paul, MN 55117-5965
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Virginia Mackay
2697 Riviera Dr S
White Bear Lake, MN 55110-4923
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Leo Klisch
po box 247
st. joseph, MN 56374
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Sincerely,

Jonelle Ringnalda
761 Hague Ave
Saint Paul, MN 55104
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1130 Clam Falls Drive
Frederic, WI 54837
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868 4th
Faribault, MN 55021
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Sincerely,

Debra Sluis
12668 185th Street
Milaca, MN 56353
Dear Ms Grosenheider:

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How big must our factory farms get before we realize that we have lost all perspective, all common sense and dignity regarding the way we raise our food? Must corporate farming be the only way? Is completely separating ourselves from the food growing process really a healthy way to proceed? Is it really in our (Minnesotans’) best interest to let corporate economics drive farming to the extent that small farmers are forced out?

These questions might sound philosophical. You already have other letters with the facts about numbers of gallons of water and karst geology and nitrates. I ask you to heed those facts, but I ask you also to consider the ideas behind these facts in contrast to practices that tend toward trusting the more and more and bigger and bigger mentality. There ARE other ways to raise food that promote the dignity, health and THEREFORE the wealth and prosperity of Minnesotans.

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Sandra Webb
827 Zenith St E
Lanesboro, MN 55949
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This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on
our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

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Sincerely,

Blanchard And Doris Krogstad
25894 430th St SE
Winger, MN 56592
Dear Ms Grosenheider:

The Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County is insufficient information for decision making by state and county governments. The combined effects of these huge potential expansions in our karst geology areas of SE MN is now and will continue to be a growing detriment to our ground water resources. Only an EIS can begin to show that this expansion and any others like it are a very bad idea. Having lived in SE MN all my life, I have seen enough damage done to our natural resources by larger and larger agricultural projects that are not sustainable and should have never been allowed. It is time for better, science based decisions that consider long term consequences.

Sincerely,

Mike Kennedy
316 West 7th Street
Winona, MN 55987
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows (https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php).

The EAW indicates that this factory farm expansion will generate 46 million gallons of liquid manure annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order the completion of an Environmental Impact Statement (EIS).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

Climate change has increased intense rainfall events—since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).
The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County's ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

Jim Schumer
1213 County Road 2 S
Saint Stephen, MN 56375-9603
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

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Sincerely,

Gerald Lelou
1628 Case Ln
Saint Cloud, MN 56303-1145
Dear Ms Grosenheider:

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Sincerely,

Barbara Finley-Shea
2816 17th St. SE
Austin, MN 55912
Dear Ms Grosenheider:

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Sincerely,

Lynn Albrecht
24785 Chatfield Drive
Belle Plaine, MN 56011
Dear Ms Grosenheider:

As a concerned Episcopalian and Priest, I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

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Sincerely,

Thomas Harries
10520 Beard Ave S
Bloomington, MN 55431
Dear Ms Grosenheider:

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Sincerely,

Chris Hughes
3515 Snellling Ave North
Arden Hills, MN 55112
Dear Ms Grosenheider:

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Sincerely,

Elise Kyllo
26 pincushion drive
Gand marais, MN 55604
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of linew001@umn.edu
Sent: Tuesday, November 13, 2018 10:12 AM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

Dear Ms Grosenheider:

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Sincerely,

Joe Lineweaver
305 Thompson Avenue, East
West St. Paul, MN 55118
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Sincerely,

Katherine Clinch
3717 Fairway Point
Woodbury, MN 55125
Dear Ms Grosenheider:

As 75-yr old’s, my husband and I still consume dairy products, but are alarmed at the project, as described below, to increase a dairy herd in the Winona area by 3,000 animals. We live in potato country in northern Minnesota and know what nitrate contamination of our city’s water source has meant to us. It appears to be even more consequential for the Winona area.

These comments concern the limited scope of the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. We understand that the proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

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Florence Hedeen
703 First St. West
Park Rapids, MN 56470
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com>
Sent: Tuesday, November 13, 2018 10:02 AM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Sincerely,

Ron Pribyl
415 7th St NE
Fosston, MN 56542
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I grew up on a small dairy farm in SW MN and know any 'corporate' farm trying to raise this many cows in one location will have profound, negative effects on all surrounding farmers. Even a farmer raising 200 to 300 cows near us made the air quality often sickening for us. I totally agree with the above reasons an EIS study needs to be done.

Diane Boushek

Sincerely,

Diane Boushek
506 Ardmore Dr
Golden Valley, MN 55422
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Sincerely,

Marie Piltingsrud
12346 220th Avenue
New Richland, MN 56072
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Sincerely,

Donna Butler
8438 Mississippi Blvd NW
Coon Rapids, MN 55433
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Charles and Marilyn Magnuson
2744 199th Ave NW
New London, MN 56273
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Ron Kroese
2048 Garden Avenue
Falcon Heights, MN 55113
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Sincerely,

Kassie Brown
488 Charles Avenue
Saint Paul, MN 55103
Dear Ms Grosenheider:

I am writing to express concern over the proposed expansion of the Daley dairy expansion from approximately 1600 to a proposed herd of more than 4600 cows. This is clearly a very substantial increase (>280% increase). This is clearly a "big ag" corporate farm, dwarfing the typical family owned dairy operation in MN. I am concerned about the potential adverse impact of this operations on water, both in terms of potential contamination of both surface and ground water, and the magnitude of use in dairy operations. There clearly is the risk of significant environmental impacts from this factory farm. Corporate ag would like to argue otherwise and restrict public input.

I understand that MPCA is currently conducting a preliminary assessment of the proposed expansion (EAW). The potential environmental consequences associated with this expansion are significant enough to warrant a full assessment as would be completed in an Environmental Impact Statement (EIS).

Sincerely,

John Goodfellow
PO Box 132
Marine on St Croix, MN 55047
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Joan Olson
61369 223rd St
Litchfield, MN 55355
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Sincerely,

Allen Larson
3408 Beauty Lake Rd SW
Pillager, MN 56473
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County.

As a neighbor in Wisconsin, and fellow inhabitants of the same sensitive karst geology region I am extremely concerned about the trend toward ever larger dairies and other animal operations which both draw down enormous amounts of water from the aquifer and produce even more enormous amounts of manure which are likely to eventually contaminate the same aquifer. The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground.

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17483 Kendall Ave
Norwalk, WI 54648
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81307 150th Street
Sacred Heart, MN 56285
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19289 150th st
Hanska, MN 56041
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Ron Laswell
1414 31st Street S.
La Crosse, WI 54601
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6580 Glen Rd Woodbury, MN
Saint Paul, MN 55129-9503
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17251 Marscfield LN SE
Prior Lake, MN 55372
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12327 170th ST
NEW ULM, MN 56073
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Kyle Black
1081 Gilmore Valley Road
Winona, MN 55987
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The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground water. The impact of increased nitrogen levels is unsustainable. Nitrate levels in the ground water will exceed the level for safe drinking water. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

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Sincerely,

Marian Severt
11465 Easy Street
Brainerd, MN 56401
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Large corporate farms are designed from the ground up for profit. They are a major factor in the decline of the small family farmer. Smaller farms tend to be more diversified and environmentally friendly. Survival is dependent on the health of the land. We(humans) are way beyond the time frame where we should be able to recognize that the health of our land and our water is directly connected to our health and wellbeing. We need to start considering the land and the water and the animals as sentient beings entitled to the same rights as human beings. The burden of proof belongs to the large corporations. The living ecosystems that will be violated by large corporate farming need a voice. The request for an Environmental Impact Statement should be a requirement that can not be influenced by politics, political parties and special interests. Please take a look at the big picture and ask for an Environmental Impact Statement. ALL of our lives are depending on it.

Sincerely,

Sarah Sander
3956 Cty #
Brownsville, MN 55919
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Sincerely,

Ruth Lindh  
436 Newton Av S  
Minneapolis, MN 55405-2039
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Candace Marx
47323 County 11 Blvd.
Mazeppa, MN 55956
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Dustin Szumowski
113, County Road W
River Falls, WI 54022
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My grandparents were dairy farmers. I understand something of the life. You cannot take humane care of animals in an operation this big.

I live downstream from this operation. I do NOT want their waste polluting my water.

Sincerely,

ha hulett
144 Eagles bluff
La Crescent, MN 55947
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Sincerely,

Patty Kakac
21467 County Rd 24 NW
Evansville, MN 56326
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Donna Stockman
6375 Upper 35th St N., Unit 16
Oakdale, MN 55128
Dear Ms Grosenheider:

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Sincerely,

Eric Gatehouse
S1567 Simpson Rd
Wisconsin Dells, WI 53965
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Dean Borgeson
36030 Bonnie Lakes Rd
Crosslake, MN 56442-3081
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Dawn Pesicka
3200 S Terry Ave
Sioux Falls, SD 57106
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Jean Greenwood
4515 Garfield Ave.
Minneapolis, MN 55419-4848
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Sincerely,

Christina Schmitt
3140 43rd Ave. S.
Minneapolis, MN 55406
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Sincerely,

Michael Snater
1312 Skyline Drive
Winona, MN 55987
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This expansion has serious side effects of increasing nitrate levels in the surrounding groundwaters with grave effects on people and the environment. It is due diligence to analyze this through an EIS. Another concern is the high risk karst area that this factory farm would be located in making it subject to sink holes. An EIS should address this.

Pesticide measurement and mitigation is not addressed in the EAW. This is significant in this area of Minnesota and should be acknowledged. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

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Sincerely, Dianne Polasik

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Dianne Polasik
14420 94th Street N
Stillwater, MN 55082
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. This increase of 3,000 cows would make this one of the largest dairies in the state. The huge increases in water demand and liquid manure and wastewater will definitely affect the environment greatly, especially in this area of karst geology, where sinkhole collapses of lagoons and high levels of nitrate due to accelerated entry of surface waters into groundwater are major risks. As a retired U of M soil scientist, I am shocked that these potential impacts have not triggered a more detailed environmental review process. An Environmental Impact Statement is required to address several concerns:

1) the potential for sinkhole-related manure pit failure. Moving earth (digging, displacement), pumping water, and storing water would all be required for the proposed 400’ X 400’ X 16’ manure pit and these are all contributors to sinkhole development. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

2) the potential for high nitrates and pesticides to occur in well water. We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. The EAW indicates that groundwater is present at average depths of only 16-20 feet in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

3) the potential for lagoon failure due to extreme weather. Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

4) the impact of a quadrupling of water usage on nearby communities and water bodies. This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

5) Economic and transportation impacts. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

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Sincerely,

Deborah Allan
1575 Merrill St
Saint Paul, MN 55108
-----Original Message-----
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of margolislaurence@gmail.com
Sent: Tuesday, November 13, 2018 1:34 PM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Sincerely,

Laurence Margolis
3916 Avondale St
Mitka, MN 55345
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

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Sincerely,

Joseph Adler
3305 126th Lane NE, Unit E
Blaine, MN 55449
Dear Ms Grosenheider:

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The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

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Sincerely,

Molly Nemec
12975 351st Court
Lindstrom, MN 55045
Dear Ms. Kim Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP, dairy expansion proposal near Lewiston in Winona County. This is a proposed expansion from 1,728 cows and calves to 4,628 cows, calves and heifers, making it one of the largest dairies in the state. Over 96 percent of dairies in Minnesota are 500 cows or smaller and 86 percent are less than 200 cows ([https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php](https://www.nass.usda.gov/Statistics_by_State/Minnesota/index.php)).

The EAW indicates that this factory farm expansion will generate 46 million gallons of liquid manure annually. The EAW clearly demonstrates that this facility will have the potential for significant environmental impacts and therefore, as required by law, I request that the MPCA order the completion of an Environmental Impact Statement (EIS).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

The proposal will produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" ([www.mda.state.mn.us/townshiptesting](http://www.mda.state.mn.us/townshiptesting)). This is part of the record. USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS ([https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211)).

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The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County’s ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

Ron Pribyl
415 7th St NE
Fosston, MN 56542
Dear Ms Grosenheider:

Please, please think about the dramatic costs associated with such unethical, unintelligent industrial practices. This is not farming, plain and simple.

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

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We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

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Sincerely,

Dustin Braun
3324 Portland Ave
Minneapolis, MN 55420
Dear Ms. Kim Grosenheider,

Please see attached letter regarding the purposed "mega dairy".

Thank you,

Donovan Dyrdal
Dear Ms. Kim Grosenheider,

I live in an area where one of these “mega dairies” formerly existed. This farm was also out of compliance with the MPCA. These big dairy farms are driving out small dairy farmers. Several were lost when this mega dairy came in, and now they are gone and so is the mega dairy. Don’t do this to the small farms around the proposed mega dairy.

People that grow up on dairy farms have such a strong work ethic. I can sure tell over the years in our labor force the decline in capable people available to fill the roles in the agricultural industry. The expense of the farms being out of compliance with the MPCA and the several mega dairy operations that have come and gone have already cost this state too much.

They are out of compliance with the MPCA, that should be enough said. Then you factor in the very real water quality concerns, do not contaminate our finite fresh water resources.

Do not allow the mega dairy.

The comments below further provide other information regarding the negative impact that this mega dairy would have in Winona County.

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

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Sincerely,

Donovan Dyrdal
dyr-valley@hughes.net
218.681.8606
12744 180th St NW
Thief River Falls, MN 56701
Dear Ms Grosenheider:

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CAFOs are not the right way to farm for the health of people or the health of the environment. Industrial farming should be under the same level of scrutiny of any other industrial activity and meet the same environmental standards.

Sincerely,

Mark Plemel
3875 JACKSON RD
CLOQUET, MN 55720
Dear Ms Grosenheider:

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Sincerely,

stacie spaeth
6516 channel rd
Minneapolis, MN 55432-4627
Dear Ms Grosenheider:

Please consider my comments. I have been in contact with several people who live in the area where the Factory Farm owner of Daley Farms wants to expand a herd of cows. I am opposed to Factory Farms for many reasons, including, damage to water, soil and the animals themselves, let alone pollution to the property of human neighbors. Definitely a review is necessary to assure that any such Factory Farm owner is protecting our wonderful environment for us, their neighbors and the next generations. Therefore, with others, I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrsc143_014211).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events—since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts.
on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take—if restoration is even possible.

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley’s existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult to trust that the MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

Sincerely,

Kathleen Mary Kiemen Ssnd
1284 Eldridge Ave W
Saint Paul, MN 55113-5918
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state.

This area of our state, with its karst geology of porous limestone and a high tendency to produce sinkholes, is particularly sensitive and vulnerable to groundwater contamination. The proposal will produce 46 million gallons of liquid manure and wastewater which could very quickly pollute ground water as well as aquifers. Contamination of the water would likely bring nitrate levels to an even higher level in an area where well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting). It is essential, for the good of this rural community, to thoroughly analyze the potential impact of increased nitrogen in ground water through an EIS.

There is a strong possibility of sink holes developing in this area. The creation of a larger facility involves digging and displacement of soil, pumping and storing water, all things that would increase the likelihood of new sink holes. Short of a failure of the manure lagoon, leakage from the lagoon would result in serious pollution of ground water. The Minnesota Pollution Control Agency needs to analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

A new factor that we must pay attention to and adequately plan for is the increased intense rainfall events that are occurring in Minnesota. Rainfall totals of over 9 inches in a 24- to 36- hour period have occurred three times since 2004. The capacity of a manure lagoon must be able to handle a rain storm of this nature without polluting the groundwater. (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

The total amount of water used in this project is enormous, about 92 million gallons of water per year and would put a strain on the local water supply. With additional wells needed for this project, the impact on local water supply must be evaluated. This includes the effect that additional water usage would have on the local aquifer, and potential effect on lakes, streams, and wetlands.

The overall effect on the economy of the rural community must also be considered, in particular in how it affects neighboring family farms and moderate-sized dairy farms. This includes the need to access impact on local roads.

It is essential that an EIS is conducted in order to protect natural resources, including ground water supply and quality. The health of humans as well as wildlife is at risk with this project. In considering the impact of factory farms, it is very important to consider the overall well-being of the people, the local economy, and the natural environment. Once facility can cause tremendous damage, so it is imperative that the plan for a larger operation be carefully studied through an EIS.

Sincerely,

Diane Klinefelter
1011 Iowa Ave W
Saint Paul, MN 55117-3360
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

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Sincerely,

Judith Meyer-Larson
36244 Shady Lane Trail
Cannon Falls, MN 55009
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Sincerely,

Jeanne Groebner
32526 Hugo Dr
St. Peter, MN 56082
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Sincerely,

Thomas Richards
3333 Red Oak Lane
Barnum, MN 55707
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Sincerely
Deborah Alper

Sincerely,

Deb Alper
1835 fairmount ave
St. Paul, MN 55105
Dear Ms. Kim Grosenheider:

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Lastly, I am concerned that a project that is clearly not allowed by the Winona County Ordinance is currently being considered for a state feedlot permit by the MPCA. Winona County’s ordinance states: "No permit shall be issued for a feedlot having in excess of 1,500 animal units per feedlot site." The current Daley Farms operation was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue, but not expand. The county ordinance states: "No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity."

Sincerely,

Paulette Pass
170 Good Counsel dr.
Mankato, MN 56001
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Sylvia Borgmeier
170 Good Counsel Dr
Mankato, MN 56001-3138
Dear Ms Grosenheider:

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Sincerely,

DAVID WASHBURN
225 E. 9th St., Unit 601
St Paul, MN 55101-2522
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Meg Anderson
225 9th St E
St Paul, MN 55101
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Lee Randall
3098 Alexander Lane
Mound, MN 55364
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Kathy Crandall
6259 County Road 15
Herman, MN 56248
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125 N 2nd Ave E
Duluth, MN 55805
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2931 W. 85th St.
BLoomington, MN 55431
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Gretchen Bratvold
3444 Edmund Blvd
Minneapolis, MN 55406
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Sincerely,

Wayne Hervey
502 1st Av So
WHEATON, MN 56296
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Sincerely,

Melissa Hochstetler
2200 E24th St
Minneapolis, MN 55404
Dear Ms. Grosenheider:

My first reaction was to laugh at what is certainly a preposterous plan. Over four and one-half thousand cows on one site in a karst subsoil area. Surely, this must be a joke and the Daley Farm folks are pulling our leg.

But no, it's for real. So, I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

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Please order the EIS.

Thank you for your attention and for this opportunity to comment.

Sincerely,

Joan Meierotto
13900 44th St S
Afton, MN 55001-9371
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Mark M Giese
1520 Bryn Mawr Ave
Racine, WI 53403-3606
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204 west 77th street
Chanhassen, MN 55317
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John Fisher-Merritt
2614 County Road 1
Wrenshall, MN 55797-8718
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Sincerely,

Mary Voight
951 McKnight Road
St. Paul, MN 55119
Dear Ms Grosenheider:

My name is John Harper, and I am writing to you to voice my "against the proposed expansion of the Daley farm". I grew up on a small family farm in the 70's and 80's with enough cows and hogs to raise a family of 6. Agriculture was our way of life. We knew the land and the land knew us. The land gave us crops and food for our animals, which in turn gave us a rural life that can never be taken from us. We also knew the direct importance of a clean environment and how farmers can change that. We were and are still grateful to farming and the farmers that choose this vocation of work.

My family and I currently live within 1 mile of the Daley Farm. We are DEEPLY CONCERNED about their environmental impact of their proposed farm/animal expansion. We currently have clean, fresh, low nitrate water, but will we if the Daley farm is expanded? Will their proposed water usage deplete the underground aquifers? Will sink holes develop around their proposed site-spilling millions of gallons of manure and animal waste into the aquifers? I don't know, and I don't think anyone really knows. For these reasons, I am against the Daley expansion......for the health of ALL people living within the Lewiston-Daley Farm region.

I like the Daley family, for I've even taught their kids in the public elementary school for the past 20 years. I do not like their proposed business idea for the future. I see too many people being affected in an ill way if this proposed operation passes.

Thank you for considering my point of view, John Harper Altura, MN

-----Original Message-----
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of siloways@hotmail.com
Sent: Tuesday, November 13, 2018 8:46 PM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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21579 Only Avenue
Altura, MN 55910
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-----Original Message-----
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of kimber.kurt@gmail.com
Sent: Tuesday, November 13, 2018 8:13 PM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP
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Sincerely,

Kurt Kimber
4811 35th Ave S
Minneapolis, MN 55417
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Darcy Bergh
1121 Hallam Ave N
Mahtomedi, MN 55115-1569
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732 West 4th Street
Winona, MN 55987
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16363 70th Ave
Little Falls, MN 56345-5282
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richard Laybourn
11020 oregon curve
bloomington, MN 55438
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9601 Union Road PO Box 1
Donaldson, IN 46513-0001
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Pollution of ground water, streams and rivers is no longer acceptable. The over use of our water supply is a growing concern as climate change continues.

Quality of life issues in these areas are despicable and a health hazard also.

Until these farms find a way to comply with existing rules, and prevent additional compromise of our resources, they should not be allowed to operate, much less expand.

If the MCPA can not oversee and these issues in a timely manner, they should be replaced with people that can.

We are all watching this closely. We pay taxes and WE VOTE.

Sincerely,

Wendy Peardot
4500 Southmore Dr
Minneapolis, MN 55437
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Sincerely,

Mickey Foley
1796 29th Ave NW
New Brighton, MN 55112
Dear Ms Grosenheider:

It is time for the safety of the public and rural economic stability to take precedence over corporate profits. For these reasons and all of the supporting evidence listed below you must do all the due diligence EIS work. Or Better Yet, just call it a day skip the expense and refuse to permit this operation. The risks are high (just ask North Carolina) and the potential financial benefits will only serve a very few but will hurt many small producers.

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Sylvia Luetmer
2204 E Lake Jessie Road SE
Alexandria, MN 56308-8925
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Tim Olish
7420 Izaak Walton Rd W
Bloomington, MN 55438
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Amelia Shoptaugh  
888 Thomas Avenue  
Saint Paul, MN 55104-2630
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Sincerely,

Gwen S Myers
12009 Hilloway Rd W
Minnetonka, MN 55305
Dear Ms. Grosenheider,

I am writing as a concerned citizen, user of dairy products, user of clean water and inhabitant of the Metro area. This proposal of Daley Farms to expand exponentially is a really unsound idea. There is such a thing as being too big and that looks to be true of this proposal. The expected water usage and its effects on the aquifer plus the huge issue of the manure pond containment in a geological region of karst formation speaks very strongly for a thorough Environmental Impact Statement. Also Daley Farms has a blemished record of meeting environmental standards as it is. Please protect all of us and our environment with a thorough EIS. Thank you!
Dear Ms Grosenheider:

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. When will we return to the days of COMMON GOOD over the CORPORATE PROFIT MOTIVE that destroys. Regenerative Agriculture is a solution that needs to be considered and protected in all PUC Agricultural reviews and recommendations. Study and educate yourself about the benefits you could be encouraging we move toward.

Sincerely,

Ginny Halloran
4011 Queen Ave S
Minneapolis, MN 55410
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Having many friends in this beautiful area, that is a favorite destination for us, please protect the health and safety of this place.

Sincerely,

Sheryl Samuel
891 Berme Rd
High Falls, NY 12440
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Milo Oien-Rochat
5908 Russell Ave S
Minneapolis, MN 55410
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Kathleen Blake
835 NE 3rd Ave
Grand Rapids, MN 55744-2816
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Sincerely,

Gloria Degele
1284 Eldridge Ave W
Roseville, MN 55113-5918
Dear Ms. Grosenheider,

I am writing to express my concern regarding the Massive Farm proposal and believe it is in the best interest for all to implement an EIS in response to this request. The size of this proposed farm is enormous and the demands it will have on the environment are very real and need very careful consideration.

The liquid manure and wastewater generated is of great concern and the demand of water use will be taxing. The safety of processing this amount of waste in an area prone to sinkholes is a great risk.

Minnesota has had a reputation for taking care of its natural resources, but economic claims create real challenges. I do not want the State of Minnesota to not take into consideration the long term and negative environmental and economic effects of such a proposal, with only a short term view of any economic benefits. We are all at a point in time when we can no longer afford to not fully understand the long term risks and costs of decisions that are made. We have been turning away from environmental issues for too long and it is catching up to us. Tainted drinking water and cancer rates are not something that easily goes away.

We need a balanced solution to all of the state’s farming practices. There is nothing balanced about this mega operation proposal and because of this alone, it requires careful and detailed scrutinization.

I therefore ask that a full and detailed EIS take place. I would further like there to be a discussion in general about requests such as a mega-dairy farms in Minnesota, and perhaps some guidelines could be developed so that this request and future requests may be placed within a forum that does not pit environmentalists against business and economic interests. There is too much US vs THEM going on in our discourse. We need greater understanding of how we can live and work with a quality of life that we can all be proud of.

Thank you

Elizabeth Wehrwein
1403 Albany Ave
Saint Paul, MN. 55108
c) 651-470-6943
albanyskye@mac.com
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Sincerely,

Richard Engdahl
5293 Nolan Parkway
Stillwater, MN 55082
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1112 North jSecond Street
Stillwater, MN 55082
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Dorothy Dolezal
3005 West 43rd St
Minneapolis, MN 55410
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137 w 46th  
Minneapolis, MN 55419
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Sally Vogel
19429 US Highway 218
Austin, MN 55912-5867
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18356 Sylvan Heights Rd
St. Charles, MN 55972
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The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400’ X 400’ X 16’ manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

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The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on
our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult to trust that the MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

Sincerely,

Luke Nord
2027 worcester ave
saint paul, MN 55116
Dear Ms. Grosenheider:

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The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult to trust that the MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

I am opposed to this expansion for environmental, health, and moral reasons. People are consuming less dairy and MN should be looking toward the future, with more sustainable and less harmful practices.

Sincerely,

Kellie Hoyt
3140 Bryant Ave S #4
Minneapolis, MN 55408
Dear Ms Grosenheider:

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And there is currently a national excess of milk in the market, resulting in prices below the cost of production. This has been the case for the past three years. A UMN expert economist has stated that 80% of Minnesota dairy farms should stop milking cows (close down their dairies) because they cannot get a sufficient price to cover their costs. So we do not need more milk to “feed the world” or supply our communities.

The proposed expansion will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

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Sincerely,

Joan Stockinger
4119 York Ave South
Minneapolis, MN 55410
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of Dianab.aka.mommy@gmail.com
Sent: Wednesday, November 14, 2018 1:34 PM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. An in-depth Environmental Income Statement (EIS) is absolutely necessary. I can hardly believe I have to request this when the IPCC has given us 12 years to limit climate change enough to keep the world as we know it. Worldwide, animal agriculture is responsible for 90 percent of methane emissions and the U.S. habit of raising animals for food contributes more than half of our carbon footprint. There is no longer a place in this world for this kind of factory dairy operation. I am asking you to protect us.

The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

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We have to make changes now. An EIS is required to show the true costs of an operation like this.

Sincerely,

Diana Brainard
4544 Sunset View Drive
Duluth, MN 55803
Mr Gernes,

We share the water supply (aquifer) that Daly farms is relying on for their expansion. In our region of Minnesota alone, in the last 15 years, there have been three storms with rainfall totals over 9 inches during 24- to 36-hour periods in the last decade. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation.

This should be addressed prior to any consideration of expansion.

Thank you,
Vincent Ready
11048 Cox Dr
St charles MN 55972
Mr Gernes,
Concerning the decision whether there needs to be a hearing for Daley Farms.

Although the MPCA acknowledges that Daley Farms manure pits and feed pads are out-of-compliance, they’ve been allowed to continue operating for evidently about 10 – 12 years without fixing the problem. This flies in the face of a standard of “pollution discharge elimination”.

It appears that during this period of non-compliance and non-enforcement, there has been no monitoring by MPCA of chemical and bacterial impact or any effort to measure the impact of leakage and runoff from out-of-compliance facilities on local water. Therefore, it makes no sense that Daley Farm’s proposal is being considered for permit when proposed new buildings for their expansion are still in need of plans to be developed to collect runoff.

Given the proximity to known sink hole features, construction of a new 400’ X 400’ X 16’ manure pit which would have to meet a ZERO discharge standard, it’s impossible for the public to have confidence this standard will be enforced. If the past is any indication of the future, it’s a red flag. The volume and potential harmful impact of the new manure pit alone increases current issues and threats to public health.

Please consider these facts.

Thank you,
Vince Ready
11048 Cox Dr
St Charles Mn 55972
Mr Gernes,

Given the following reasons and information, it is clear that the NPDES permit application for the Daley farm be denied and a contested Case Hearing be held:

* The MPCA has allowed the Daley farm manure lagoons and feed pads to be out of compliance for approximately 10-12 years.
* During this period of non-compliance, there has been no monitoring by the MPCA for chemical or bacterial effect, no effort to measure the impact of the out-of-compliance measures, or effort to collect data on any of these effects. Why in the world would the county trust the Daley farm or the MPCA to follow their own regulations now?
* The documented karst geological formation of the area predisposes it to catastrophic sinkhole development. Oh that’s right, that has already occurred in 1991 when the Lewiston Municipal sewage lagoon disappeared into a sinkhole. Maybe you forgot that.
* The combination of massive water use, vast amounts of animal waste producing huge quantities of nitrogen added to the soil, and likelihood of sinkhole formation require that an EIS be required as it is without a doubt that there would be "significant environmental impact" if this plan were to move forward.

No NPDES permit, and an EIS required is the least the MPCA can do at this point after wasting taxpayer dollars on an effort that would endanger the land, water, air, and citizens of Winona County.

Thanks and hopefully,
Amy Cordry
26006 County Road 9
Winona MN 55987
507.454.7731
As a concerned citizen, I must let you know I am strongly opposed to the Daley farm expansion. I have been a multi-decades long customer of several of the nearby farms, and believe that allowing this expansion would negatively impact these farms, the neighborhood, and the image of this region. The Daley farm is already out of compliance. Bypassing ordinances that are meant to protect and preserve the land and livelihood of all the local farmers and neighbors would be a disaster, and a slap in the face to those who work and live within the rules.

Respectfully,

Deborah L. Nichols
Dear Sir:

It seems insane to not demand all the studies appropriate for this expansion. #1 Karst topography. #2 They are already in violation of waste water disposal. #3 We cannot afford the to allow the vast amount of water they would take from our aquifer we all share. Please have some respect for those of us who share water with the Daleys. There are other ways they could expand their business.

Thank you for considering my concerns.
From: Margaret M Walsh <stormymonday91@hotmail.com>
Sent: Thursday, November 15, 2018 2:01 PM
To: Gernes, Mark P (MPCA) <mark.p.gernes@state.mn.us>
Cc: Stine, John (MPCA) <john.stine@state.mn.us>
Subject: NPDES: Daley Farm

Mr Gernes,

Please do not issue a NPDES permit for the Daley Farm expansion. I think that you are very knowledgeable about Winona County having worked here. You must know that this size dairy farm is not a good fit for our sinkhole prone and fragile karst geology. A request for a dairy of this size in other parts of MN may not have the same impact that one in SE MN would have on water quality. Our impaired waterways in this part of MN are substantial. Wells are contaminated and the aquifer is at risk both from pollutants as well as a reduction of water. Clean drinking water is a necessity for people.

It would also be a shame to disrupt the habitat of fish, especially trout in our area. We would be exchanging one form of commerce for another. We are nationally known for good fishing in Winona County. The fish in our streams and rivers are more in harmony with our water than the cows.

It is my understanding that the MPCA has been remiss in monitoring the Daley Farm and other operations for chemical and bacterial pollution in SE MN for over a decade. We need testing information on run off and leakage from manure pits. I do not understand why an operation would be issued a permit when not in compliance or why the Daley Farm has been allowed to continue operation under non-compliance circumstances. I view this monitoring as the responsibility of the MPCA.

I also have some concerns about giving the Daley Farm in Lewiston a NPDES Permit for their expansion before Winona County has approved a bigger dairy. I think that your issuing the permit would act as bias on behalf of the dairy.

Again, Mr Gernes, please do not issue a NPDES permit for the Daley Farm in Lewiston. Thank you.

Margaret Walsh
1775 W Broadway Street
Winona, MN  55987
507-452-2292
Mr. Gernes,

I am writing to express my opinions on the expansion of the Daley Farm dairy operation.

I OPPOSE this expansion for the following reasons;

1. As stated in the Winona press current feeding pads and manure pits are out of compliance and have been for a number of years. Granting a permit when current requirements are NOT met is asinine and gross negligence as it relates to the public health.

2. MPCA monitoring has been lax and confidence in such monitoring as it relates to future expansion is of extreme concern.

3. This area is in a karst region and with the majority of wells in Winona County exceeding nitrate levels it puts more wells in harms way with this proposed MAJOR expansion.

4. Proposed off site distribution of manure may have a broader effect on the groundwater contamination unless these sites are monitored rigorously of which there is no indication of such action being proposed. Have future(off site)manure sites been vetted and studied for their suitability for use? Who and how often will these sites be monitored?

5. Have current land areas around this expansion been monitored for ground-water contamination? Has there been monitoring of the current manure holding facilities to dispel any potential leakage?

6. EXTREME rainfall amounts such as we have had the past few months do not bode well for manure application with the prospect of contamination.

7. The amount of water needed for this operation has the potential to undermine water quantity and quality in this area. Future study and further study is CRITICAL.

8. The amount of nitrogen and methane gas produced by this expansion is a serious concern and MUST be ADDRESSED before any further action is taken on this permit.

9. I have observed over the past two years manure application on frozen ground in this area which contributes runoff and increased water impairment.

ALL of the above issues MUST be carefully examined and publicized in an open,fair and complete manner.

In summary, the NPDES permit application for this expansion must be DENIED.
A Contested Case Hearing needs to be arranged for the safety and well-being of the public.

As a final note, a retired hydrologist for the STATE of MONTANA and a registered geologist for the Nature Conservancy has looked at this expansion in depth and has determined this expansion has serious negative effects on the environmental health of the area.

Sincerely,

Patrick Byron
157 West Third Street
Winona, MN  55987
Dear Mr. Gernes:

These are comments from the Land Stewardship Project to the NPDES permit application on the proposed Daley Farms of Lewiston, LLP – 2018 Dairy Expansion from 1,728 cows (2,275 animal units) to 4,628 cows (5,968 animal units) in section 16 of Utica Township, Winona County.

For the reasons listed below we do think it is possible for Daley Farms to meet the no-discharge standard required by a NPDES permit. Therefore, we request that the NPDES permit application for Daley Farms be DENIED. We are also requesting a Contested Case Hearing.

1. **Daley Farms facilities are currently out of compliance.** Although the MPCA acknowledges that Daley Farms manure pits and feed pads are out-of-compliance, they’ve been allowed to continue operating for evidently several years without fixing the problem. This flies in the face of a standard of “pollution discharge elimination”. It appears that during this period of non-compliance and non-enforcement, there has been no monitoring by MPCA of chemical and bacterial impact or any effort to measure the impact of leakage and runoff from out-of-compliance facilities on local water. Therefore, it makes no sense that Daley Farm’s proposal is being considered for permit when proposed new buildings for their expansion are still in need of plans to be developed to collect runoff.

2. **Given the proximity to known sink hole features, construction of a new 400’ X 400’ X 16’ manure pit which would have to meet a ZERO discharge standard, it’s impossible for the public to have confidence this standard will be enforced.** If the past is any indication of the future, it’s a red flag. The volume and potential harmful impact of the new manure pit alone increases current issues and threats to public health.

3. **Climate change has increased intense rainfall events—since 2004** in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24 to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (Study available here: [https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html](https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html)).

4. The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.5% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (Study available here: [www.mda.state.mn.us/townshiptesting](http://www.mda.state.mn.us/townshiptesting)).

5. USDA Natural Resources Conservation Service studies indicate that 200 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (Study...
6. **A failure of the manure pit due to the area’s karst geology is possible and will result in a massive discharge.** The EAW does not acknowledge or analyze the potential for the pit failure. This possible pit failure due to the sensitive karst area would result in millions of gallons of raw manure and liquid waste entering the groundwater. The EAW states this factory farm will generate 46 million gallons of manure and liquid waste annually and the pits will be emptied twice a year. This means there will be millions of gallons in the pit most of the year. Three of southeast Minnesota’s 22 municipal sewage lagoons have collapsed, the most recent in 1992. (Altura in 1976, Lewiston in 1991 and BelleChester in 1992). The MPCA must analyze what the impact of a catastrophic failure of this multi-million-gallon manure pit would be. After expansion, in total all manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed new 400’ X 400’ X 16’ manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

7. **The EAW indicates that groundwater is present at average depths of between just 16 and 20 feet in the area where manure storage is planned.** Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater. Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24 to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (Study available here: [https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html](https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html)).

8. **The impact on groundwater availability and quality pose potential for significant environmental impact.** This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible. USDA Natural Resources Conservation Service studies indicate that 200 cows produce as much nitrogen as 5,000 people. (available here and study attached [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211.](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211.))

First and foremost, water wells in Utica and Lewiston have already been compromised with nitrate and radium levels nearing, matching, and/or above the maximum level of 10mg/L designated by the Minnesota Department of Health (Available here and study attached [http://www.mda.state.mn.us/sites/default/files/inline-files/alleyresults_0.pdf](http://www.mda.state.mn.us/sites/default/files/inline-files/alleyresults_0.pdf)). Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates." (Available here and study attached [www.mda.state.mn.us/townshiptesting](http://www.mda.state.mn.us/townshiptesting)).
Direct from the Department of Health web site, “…where sources of nitrate such as fertilizers, animal wastes, or human sewage are concentrated near the ground surface, nitrate may seep down and contaminate the groundwater. Elevated nitrate levels in groundwater are often caused by run-off from barnyards or feedlots, excessive use of fertilizers, or septic systems….Nitrate contamination of a well is often regarded as a first sign of deteriorating groundwater quality.” (Available here: [http://www.health.state.mn.us/divs/eh/wells/waterquality/nitrate.html](http://www.health.state.mn.us/divs/eh/wells/waterquality/nitrate.html)).

We submit that this NPDES permit application must be denied and we request a contested case hearing due to the reasons outlined here.

Sincerely,

Barbara Sogn-Frank
Land Stewardship Project
Factory Farm Policy Organizer
612-722-6377
bsognfrank@landstewardshipproject.org

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STATE OF MINNESOTA IN DISTRICT COURT

COUNTY OF FILLMORE THIRD JUDICIAL DISTRICT

File No. CX-00-306

Fillmore County Residents
Concerned For Health, Janice Poldervaard,
Loren Poldervaard, Erwin Tart, Robert
Wood, Eloda Wood, George Heidtke,
Thomas Schulz, Larry Schulz, Otto Meyer,
Judy Tart, David Appen, Donovan Ruesink,
Jeff Tart, Joyce Tart, Sandy Oeltjen, Mark Oeltjen,
Karen Angell, Arlen Angell, Laurie Appen, Gene
Merkel, Darlene Merkel, Lois VanderPlas,
Verlyn Johnson, Sara Poldervaard, Robert K.
Johnson, Judy Bly-Smith,

Plaintiffs,

vs.

ORDER AND
MEMORANDUM OF LAW

Minnesota Pollution Control Agency,

Defendant,

Reiland Farms,

Intervenor.

This matter came on for hearing before the Honorable Robert R. Benson on September 25, 2000, on cross-motions for summary judgment.

James P. Peters and Karna M. Peters of Peters and Peters, PLC, 20020 S. Lakeshore Dr., Glenwood, Minnesota 56334, appeared on behalf of the Plaintiffs.

Ann E. Cohen, Assistant Attorney General, 445 Minnesota Street, Suite 900, St. Paul, Minnesota 55101-2127, appeared on behalf of Defendant Minnesota Pollution Control Agency (MPCA).

Michael S. Dove, 2700 South Broadway, P.O. Box 458, New Ulm, Minnesota 56073-3111, appeared on behalf of Defendant-Intervenor Reiland Farms.

This Court, being fully advised, and based on the files, records, and proceedings herein hereby finds and orders as

http://www.courts.state.mn.us/districts/third/mpca.htm

1/2/01
follows:

1. Plaintiff Fillmore County Residents Concerned for Health’s motion for summary judgment is granted;
2. Defendant Minnesota Pollution Control Agency’s motion for summary judgment is denied;
3. The attached Memorandum is incorporated by reference.

LET JUDGMENT BE ENTERED ACCORDINGLY.

BY THE COURT

Dated: December 22, 2000 /s/ Robert R. Benson

Robert R. Benson
Judge of District Court

JUDGMENT

The foregoing Order and Memorandum of Law dated the 22nd day of December, 2000 constitutes the Judgment of the Court.

Judgment is hereby entered this 22nd day of December, 2000.

JAMES ATTWOOD

COURT ADMINISTRATOR
MEMORANDUM OF LAW

Introduction

This Court, like most courts, is concerned about inserting the power of our third branch of government into areas that are primarily and appropriately within the realm of the legislative or executive branches. In the instant case, a statute was propounded by the legislature, but the enforcement and interpretation of that law was delegated by the legislature to the executive branch. Defendant MPCA argues that Plaintiffs seek to have this Court second-guess the technical judgment of the MPCA on the strength of popular opinion. "Boiled down" (to borrow another phrase from Defendant’s brief) Defendant essentially argues that this issue is none of the Court’s business. This Court wishes it were so. However, the same legislature that delegated responsibility to the MPCA also specifies by law (Minn. Stat. §116D.04 subd. 10) that an executive decision on the need for an EIS is reviewable in the District Court. Plaintiffs have properly sought the review of this Court.

Fillmore County Residents Concerned for Health has filed a motion for summary judgment, which challenges MPCA’s negative declaration concerning the need for an environmental impact statement (EIS) regarding Reiland Farms’ proposal to develop a dairy feedlot in the karst area of southeastern Minnesota. Defendant MPCA has filed a cross motion for summary judgment. The Court finds that the Plaintiffs are entitled to summary judgment. The motion of Defendants for summary judgment is denied.

There has also been disagreement over the Plaintiff’s offer of proof to the Court. The Court finds that some of these items will be allowed into evidence as stated below in greater detail.

Plaintiff’s Offer of Proof

The Court may consider evidence outside the administrative record when 1) the agency’s failure to explain its action frustrates judicial review; 2) additional evidence is necessary to explain technical terms of complex subject matter involved in the agency action; 3) the agency failed to consider information relevant to making its decision; or 4) plaintiffs make a showing that the agency acted in bad faith. White v. Minnesota Department of Natural Resources, 567 N.W.2d 724, 735 (Minn. App. 1997). If the evidence submitted outside the administrative record demonstrates that the agency’s effort was clearly inadequate or that the agency failed to set forth widely shared relevant scientific views, the Court’s proper function is to remand to the agency for correction of the agency’s error. Id.

It should be noted that the Court is only addressing the offers of proof which are being admitted and which were initially contested in this decision.

Peters Exhibit C:

This exhibit shall not be admitted. Exhibit C is unclear in its comments, and there are sufficient viewpoints from Dr. E. Calvin Alexander, Jr. present in the official record.

Peters Exhibit I:

The Guidelines for Alternative EAW form for Animal Feedlots provide general guidance on the EAW form and explains how the MPCA interprets the technical terms of "phased actions" established by EQB (Environmental Quality Board) rules. Under White and Audubon (National Audubon Society v. Minnesota Pollution Control Agency, 569 N.W.2d 211 (Minn. App. 1997)), the information is relevant to explain technical terms and is therefore admitted for this purpose.

Peters Exhibit J:

This exhibit is admitted because it is not objected to by the MPCA.

http://www.courts.state.mn.us/districts/third/mpca.htm

1/2/01
Peters Exhibit N:

This exhibit shall not be admitted. It does appear to the Court that this document, which is essentially a memo from one person in the Department of Health to another person in the Department of Health, is strictly an internal memorandum, and accordingly its admission would appear to the Court to be in violation of Audubon.

Peters Exhibit O:

This exhibit has been withdrawn by the plaintiff and shall not be considered.

Peters Exhibit S:

This exhibit is withdrawn by plaintiff and shall not be considered.

Peters Exhibit W:

The MPCA does not object to this document and it shall be considered.

Peters Exhibit CC:

The Court finds that this exhibit should not be admitted. It appears to be cumulative and it does not constitute such additional evidence that would meet the White criteria.

Peters Exhibit DD:

This exhibit does discuss a report of the MPCA (the RGU (Responsible Government Unit)) and it would appear to the Court that the data in this report is something that should have been considered by the MPCA. Clearly it does discuss the information which was in the hands of the MPCA and which it should have considered. This Court finds that this information is admissible under Audubon.

Peters Exhibit EE:

This exhibit demonstrates the scientific view that manure application can cause serious bacteria contamination of groundwater, thereby meeting the standard for consideration of the evidence. It is clear, however, that the document was available to the MPCA during its deliberations. The MPCA should recognize its own studies, and it is not necessary for plaintiff in this case to submit into the administrative record information generated by the MPCA. Accordingly the Court admits this exhibit.

Peters Exhibit FF:

The Court finds that this exhibit is appropriate to include. It contains detailed information on MPCA staff reasoning on a project that is similar even though not the same as the currently proposed project. In many ways, the Court agrees that it is not the same as the proposed project but there are parts of it that contain MPCA staff reasoning. The staff reasoning in some cases relates to the types of problems that are foreseen in the current project. Therefore, the Court finds that this exhibit does meet the White criteria. The Court understands that in the above case the MPCA board did not recommend an EIS, but some of the MPCA staff certainly did.
Peters Exhibit HH:

The MPCA does not object to this document and so it shall be admitted.

Peters Exhibit II:

The MPCA does not object to this document and so it shall be admitted.

Peters Exhibit JJ:

The Court finds that this exhibit does not meet any of the White criteria and is not otherwise helpful to the Court and it therefore shall not be admitted.

Peters Exhibit KK:

The notes shown in this exhibit are not explained to the Court in any manner. These notes are also undated and do not met any of the criteria listed in White. This Court cannot determine how these notes would be helpful to it and therefore denies admission.

Tart, Poldervaard and Heidtke affidavits and pictures:

Essentially these affidavits and pictures deal with water problems alleged in the general area where the project is to be located, but not where the lagoon would actually be located. These documents do not meet any of the criteria set forth in White. This Court finds that this information is cumulative and shall not be admitted.

Facts

The parties have essentially agreed upon the facts. The Court finds the pertinent facts to be as follows:

This project is proposed to occur in the karst regions of Southeastern Minnesota. Karst is a geological term for a landscape area created over soluble rock with efficient drainage. Constructing New Manure Storage Systems in the Karst Region, Interim Guidelines Document, pg. 2 (March 2000). The underlying carbonate bedrock in a karst region dissolves over time to produce solution-enlarged joints and cracks. Id. These features can result in rapid transmission of contaminants from the land surface to the groundwater below. Id. Groundwater contamination from excessive levels of nitrates and bacteria, which exceed state health standards, is already higher in Fillmore County than in other counties in the area.

Reiland Farms is a third-generation family farm. In an effort to compete in an ever-changing agricultural arena Reiland Farms proposed to develop a dairy feedlot near their home in Fillmore County. Reiland Farms agreed to voluntarily prepare an Environmental Assessment Worksheet (EAW) to ensure the environmental integrity of its proposed dairy.

The Feedlot expands upon and aggregates with an existing feedlot at their Home site, which is permitted for 390 animal units. According to the EAW, the Feedlot proposes to use the Home site to feed replacement heifers for the new facility and may expand. The Home site sits in an area of high risk for sinkhole formation. The EAW also affirmatively states in a check-off box that the Feedlot includes a planned and likely expansion of 560 animal units.

The Feedlot includes plans for two open manure basins holding a total of 7.3 million gallons of liquid manure with capacity to serve 1,260 animal units. The Feedlot is proposed for the karst region with nearby blind valleys and sinkholes.

http://www.courts.state.mn.us/districts/third/mpca.htm  

1/2/01
The Feedlot is proposed near the North Branch of the Forestville Creek, a high quality trout stream, near the South Branch Resort River, near groundwater resources in the area and near a state park.

In February 2000, the MPCA published an EAW that summarized environmental information relative to Reiland Farms’ proposal to develop a Feedlot. After review of geological and engineering information regarding the proposed facility, the MPCA concluded that location and design of the facility were adequately protective of the environment and that the Reilands would not be required to prepare an EIS.

**Analysis**

**THE MPCA’S NEGATIVE DECISION INVOLVING AN EIS**

This Court has jurisdiction over this matter under Minn. Stat. §116D.04, subd. 10, which provides that decisions on the need for an EIS may be reviewed in the District Court of the County where the action is proposed to be taken.

Summary judgment shall be rendered if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that either party is entitled to judgment as a matter of law. Minn. R.Civ.P. 56.03. In ruling on a summary judgment motion, the Court must view the facts in the light most favorable to the non-moving party, and resolve doubts and factual inferences against the moving party. Hopkins v. Empire Fire & Marine Ins., 474 N.W.2d 209, 212 (Minn. App. 1991). The trial court’s obligation is to determine whether issues of fact exist, not to weigh the evidence, determine credibility of the witnesses or resolve the issues of fact. Schumanchev v. Heig, 454 N.W.2d 446, 448 (Minn. App. 1990); Nord v. Herreid, 305 N.W.2d 337 (Minn. 1981).

When reviewing a responsible government agency’s negative declaration of need for an EIS, this Court reviews the decision to determine if it is "unreasonable, arbitrary or capricious, with review focused on the legal sufficiency of and factual basis for the reasons given." Iron Rangers for Responsible Ridge Action v. Iron Range Resources, 531 N.W.2d 874, 880 (Minn. App. 1995) (quoting Swanson v. City of Bloomington, 421 N.W.2d 307, 303 (Minn. 1988)). An agency’s decision is arbitrary and capricious if it represents its will and not its judgment. Trout Unlimited, Inc. v. Minnesota Dep’t of Agriculture, 528 N.W.2d 903, 907 (Minn. App. 1995).

An agency ruling is arbitrary and capricious if the agency: 1) relies on factors not intended by the legislature; 2) entirely failed to consider an important aspect of the problem; 3) offered an explanation that runs counter to the evidence; or 4) the decision is so implausible that it could not be explained as a difference in view or the result of the agency’s expertise. White at 730.

Agency decisions are reversed only when they reflect an error of law, the findings are arbitrary or capricious, or the findings are unsupported by substantial evidence. Id. The Courts have endorsed the following definition of "substantial evidence": 1) such relevant evidence as a reasonable mind might accept as adequate to support a conclusion; 2) more than a scintilla of evidence; 3) more than some evidence; 4) more than any evidence; 5) evidence considered in its entirety. Id. The Court will intervene, however, where there is combination of danger signals which suggest the agency has not taken a hard look at the salient problems and the decision lacks articulated standards and reflective findings. Id.

An EIS is required where there is potential for significant environmental effects. Audubon at 216. In determining whether a project has the potential for significant environmental effects, the agency must consider four factors: 1) type, extent, and reversibility of environmental effects; 2) cumulative potential effects of related or anticipated future projects; 3) the extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority; and 4) the extent to which the environmental effects can be anticipated and controlled as a result of other environmental studies undertaken by public agencies or the project proposer, or of EIS’s previously prepared on similar projects. Id. and Rule 4410.1700 Subp. 7 Minnesota Rules (1999). The Court will address each of the four factors in turn.

1. **Type, extent, and reversibility of environmental effects**

   The Plaintiffs claim that the MPCA’s Findings: (1) do not address the substantive comments in violation of Minn. R. 4410.1700, subp. 4; (2) contain conclusions that are contrary to the comments and the evidence in the record; (3) fail to consider MPCA’s studies that show groundwater contamination from intensive agriculture; and (4) fail to consider the incremental impacts from this operation upon the already existing contamination of ground and

http://www.courts.state.mn.us/districts/third/mpca.htm
surface water.

The Plaintiffs state that there is a wealth of evidence in the record that suggests a significant potential for groundwater contamination at this particular proposed feedlot site. They also claim that during the spring melting periods and during heavy rainfall, wide channels of water run off the land around the Feedlot. The MPCA has acknowledged the close proximity of the groundwater to the surface by requiring that the land around the basins must undergo a dewatering procedure to artificially bring down the water table. The Plaintiffs also point out the concern about contaminated groundwater and claim that the MPCA did not address these concerns, making their decision arbitrary.

One of the most significant environmental impacts posed by the planned facility, according to the Plaintiffs, is the catastrophic level of water pollution that would result from a sinkhole developing under the manure storage basin and breaching the structure. If such an event were to occur, 7.3 million gallon of liquid waste could flow into groundwater through the sinkhole breach. Plaintiffs also argue that because of the close connection between groundwater flows and surface water flows in this area, it is also highly likely that liquid waste flowing into the groundwater due to a sinkhole breach would quickly reach the surface water such as Forestville Creek, one of the premier trout streams in the state, and eventually flow through Forestville State Park and nearby campground where thousands of visitors will come into direct contact with the manure- polluted water through swimming and fishing activities.

Various individuals, especially those who live closest to the proposed feedlot, commented with concerns about air emissions and odors. The Plaintiffs claim that the MPCA made no findings on air emissions and odor and allowed the project to go forward without an EIS even where the preliminary modeling predicted air emissions would exceed allowable levels. They claim that the belated permit conditions to reduce or eliminate the potential failures in air quality demonstrate MPCA’s concern for air emissions and constitute an abandonment of MPCA’s duty to determine the potential for significant effects before they occur.

The MPCA reviewed an air emissions modeling study of the facility performed by Gantzer Environmental Software and Services, Inc. The MPCA concluded that the facility could comply with ambient standards and Health Risk Values, and that it would not cause nuisance odor that could be detected by receptors beyond the property line, although some odorous emissions could be detected at the property line. Also based on their investigations the MPCA concluded that cumulative impacts should not be significant. When dealing with air emissions this Court finds that the MPCA’s findings were based on some evidence, as discussed above.

The MPCA reviewed a manure management plan submitted by the Reilands. Based on the analysis in this plan, the MPCA concluded that the manure spreading would not result in additional loading of either phosphorus or nitrates. The MPCA found no information that would support the conclusion that manure has harsher environmental impacts than chemical fertilizers. When dealing with manure management the Court finds that the MPCA’s findings were based on some evidence, as discussed above.

The MPCA states that three prongs support its conclusion that the proposed facility would not cause significant environmental impacts as the result of karst-related failure. First, the MPCA evaluated the geological evidence regarding the proposed site. This information, it claims, suggested that the land proposed for the facility "has relatively little evidence of soil collapse problems..." even though in a moderate to high-risk area. The MPCA also considered the engineering of the proposed facility, its liner system, and depth to bedrock, claiming that this information suggested that the proposed facility would not accelerate sinkhole formation.

The MPCA claims that they followed the guidelines put in place for minimum separation distances in the karst area. They state that two factors are considered: the number of animal units to be handled at the facility and the type of storage system (liner). For facilities between 300 to 999 animal units with a composite liner, the guidance proposes that there be five feet separation between the liquid manure and the bedrock. The MPCA did find the minimum of 5 feet separation required for a facility consisting of 300 to 999 animal units.

The record shows that the MPCA did research the area of environmental effects, however, this Court finds that not all major issues were discussed by this agency. The agency neglected to talk about the possibility of the storage basin being breached underground. There were discussions about a spill above ground and what could be done in this situation, but none about underground spills. The Court agrees that there was information stating that there would be limited seepage, but that does not resolve the issue of mitigation of a spill larger than limited seepage.
There should be a plan put into effect to encompass the problem of a spill underground. How would this be contained? How would the groundwater be protected? How would Forestville State Park and the trout streams be protected? This Court is concerned because these areas were not addressed and they should have been. The Plaintiffs were correct in questioning the possible contamination of the groundwater and the trout streams located in the area.

A reviewing Court will intervene only where there is a "combination of danger signals (that) suggest the agency has not taken a 'hard look' at the salient problems and "has not genuinely engaged in reasoned decision-making." Pope County Mothers v. Minnesota Pollution Control Agency, 594 N.W.2d 233, 236 (Minn. App. 1999). This Court finds that this is the situation in the case at hand. When asked about spills the Agency would respond by talking about above ground spills and by assuring people that there would not be an underground spill or only a little leakage because of the durability of composite liners, but this does not answer the question.

This Court finds that this is a very real issue and one that should have been addressed by the Agency before finding that an EIS was not in order in this case. The MPCA neglected its duties when it did not discuss the type, extent, and reversibility of the environmental effects of an underground spill. The MPCA did make a conscious effort to discuss other issues that caused concern, but completely avoided this issue. The MPCA’s neglect in discussing this issue shows that their decision was arbitrary and capricious.

Essentially this Court finds that the MPCA considered all the concerns except how to mitigate the problem of an underground spill from the pond. If a collapse occurs, how would the pollution be mitigated? There is no discussion of this and thus the MPCA did not fulfill its requirement. On all the other issues discussed, the MPCA made a decision based on some evidence. The Court might disagree with the decision, but it is bound to honor that decision.

One of the problems also not discussed is the problem of water (from the higher water table or from precipitation) migrating downward along the outside of the liner. After reviewing studies contained in the record, it appears such water would likely travel along the liner to the bottom of the lined lagoon. Would this then carry the risk of accelerated failure of the ground under the lagoon? Is this risk greater if less than 10 feet of soil is not present between the bedrock and the liner above it?

2. Cumulative potential effects of related or anticipated future projects.

The EQB rules provide that "multiple projects and multiple stages of a single project that are connected actions or phased actions must be considered in total when...preparing the EAW, and determining the need for an EIS." Minn. R. 4410.1000, subp. 4. The EQB rules define "phased action" as meaning "two or more projects to be undertaken by the same proposer that a RGU determines: (1) will have environmental effects on the same geographic area; and (2) are substantially certain to be undertaken sequentially over a limited period of time." Minn. R. 4410.0200, subp. 60.

The Plaintiffs state they have submitted evidence that the expansion is substantially certain to occur in a limited period of time, including: 1) MPCA’s own certified admission at pages 4 and 19 of the EAW; 2) the Project site map showing the exact location of the future freestall barn on Exhibit 3a, page 1 to the EAW; and 3) the May 23, 2000 Findings of MPCA verifying that the manure settling basin and the manure storage basin are designed for manure from 1,000 mature dairy cows (1,400 animal units).

The MPCA states that the definition of "phased action" in the EQB rules ensures that environmental review is not undertaken on expansions of projects that are speculative. The MPCA argues that although the EAW notes that the Reilands have designed their new dairy facility to accommodate future expansion, the MPCA would have been on solid ground had it decided not to include any information in the EAW regarding the impacts from the expansion because it was not "substantially certain" to occur in a "limited period of time."

The Court disagrees with the MPCA. This Court finds that there is a strong possibility that there will be an expansion within a limited period of time. The new freestall barn will encompass the same land as what is in dispute in this action. The Court also finds that this barn will be constructed in a limited period of time. Although there is no guidance on what "limited period of time" means, this Court finds that it is relatively certain that a barn will be constructed in the near future. This information is supported by the fact that the plans do have the freestall barn listed on them. This information is also supported by the fact that the storage basin is large enough to hold...
manure for at least 1,000 animal units.

The law is explicit that large projects must not be broken up into smaller units in order to avoid environmental review. Pope County Mothers at 237. The rules governing environmental review recognize that cumulative impacts can result from individually minor but collectively significant projects taking place over a "period of time." Id.

The Court’s decision that this is actually a phased action will also impact the minimum separation distance that is mentioned under the first factor. To determine whether the minimum separation distance will be met, the owner must conduct soil thickness investigations at a minimum of four locations for the first one-half acre of manure storage area surface and a minimum of two additional locations for each additional acre. Constructing New Manure Storage Systems at 8. According to Table 1 of this article a minimum separation distance of 10 feet is needed when the basin is serving over 1000 animal units. Id. at 9.

The Court is also perplexed by the fact that the MPCA and the Reilands argue that they can store manure in these basins for up to a year, and very well may do so, but this would not force them to have 10 feet minimum separation. Would this not be the same volume and amount of weight that would be caused by having over 1,000 animal units and emptying the basin twice a year? At any rate, this Court finds that since the current project and the anticipated freestall barn shall be considered as a phased action this project would still need to have at least a minimum separation of 10 feet between the bedrock to meet the MPCA’s own guidelines.

3. The Extent to Which the Environmental Effects are Subject to Mitigation by Ongoing Public Regulatory Authority.

The extent to which environmental effects are subject to mitigation is an important consideration when determining whether a project has the potential for significant environmental effects. Pope County Mothers at 238. The MPCA must consider the extent of the environmental effects likely to result and how those effects could be mitigated. Id. Mitigation includes avoiding or limiting the size of a project, repairing or restoring the environment, working to preserve or maintain the environment during the life of the project, or replacing or substituting resources. Trout Unlimited at 907.

The Plaintiffs state that the MPCA is improperly deferring key issues to the permitting phase; one of them being whether this proposed operation poses a significant environmental impact. The Plaintiffs claim that the MPCA is relying on soil inspections during the construction of the manure storage basin to determine whether there is subsurface evidence that suggest a possibility of sinkhole development under the manure storage basin. They state that deferring the gathering of key information to the post-permitting stage is an abandonment of the agency’s duty in an EIS determination.

The Plaintiffs are concerned because the MPCA did not seek additional Ground Penetrating Radar tests in better conditions to obtain a thorough investigation of the subsurface conditions under the manure basin before allowing the project to proceed. They state such soil investigation during construction will not provide the kind of subsurface investigation that Dr. Alexander and the DNR insist are necessary. Dr. Alexander stated that the additional investigation was easy to redo and the DNR stated that additional information was necessary and could be obtained reasonably. The Plaintiffs state that the MPCA’s negative decision was premature and based on inadequate information.

The MPCA states that the case at hand does not have the same problems as Trout Unlimited and their decision should be upheld. In Trout Unlimited, the Court struck down the Department of Agriculture’s decision to identify significant impacts associated with pesticide and fertilizer application by monitoring after permits for the use of those chemicals were issued, instead of examining whether such impacts had the potential to be significant during the environmental review process. The Court found that the purpose of environmental review was to ensure that risks were identified before they occur, and that unspecified "monitoring and permit conditions" required after the deleterious effects occurred would not suffice. Id. at 909.

The Defendant states that the Court did not hold, however, that it was improper to consider mitigation of risks by specified emission limits and operating requirements proposed for facility permits. The Defendant points out that the Court has in other cases specifically noted that consideration of such mitigation measures during environmental review is appropriate so long as they are "more than mere vague statements of good intentions." Iron Rangers at
881. The MPCA concludes that the problem in Trout Unlimited was that the Commissioner of Agriculture both failed to examine the environmental effects likely to result from the project and how any effects could be mitigated; thus, so long as the EAW sets forth specific mitigation measures to address specific environmental effect, such consideration is proper.

The very purpose of an EIS is to determine the potential for significant environmental effects before they occur. Trout Unlimited at 909. By deferring issues to later permitting and monitoring decisions, the Commissioner abandoned his duty to require an EIS where there exists a "potential for significant environmental effects." Id.

Both Plaintiff and Defendant have offered logical arguments to support their respective positions. After a thorough review of case law and the facts, the Court finds that the MPCA did not address the mitigating factors. As in Trout Unlimited, the project here would go forward without an EIS and in the event significant environmental effects did occur, the project may be cancelled. The MPCA is relying on permitting and monitoring just as the RUG did in Trout Unlimited. As stated above the MPCA does not even address certain issues, much less talk about how to mitigate them. It is the MPCA’s duty to determine the possible environmental effects; they have neglected this duty in the case at hand.

The Court also questions the fact that the basin is larger than the capacity needed at this time, which supports the finding that this project is a phased action. One of the factors to consider when looking at mitigation includes limiting the size of the project. It would make sense for the MPCA to have limited the size of the storage basin, given the sensitive karst region and the claim that there is not any immediate plan to expand. This reaffirms the Court’s finding that the MPCA did not fulfill its duty when dealing with the issue of mitigation.

4. The extent to which the environmental effects can be anticipated and controlled as a result of other environmental studies undertaken by public agencies or the project proposer, or of EIS's previously prepared on similar projects

The Plaintiffs claim that the MPCA had relevant information and disregarded it. The MPCA has been studying nitrates in Minnesota groundwater beneath agricultural land for years. In March 1999, the MPCA identified groundwater impacts from land application of manure as one of three objectives for examination in a study entitled "Effects of Manure Management on Ground Water Quality." The MPCA was also provided a copy of the Iowa Department of Public Health's article on the chemical and microbial constituents of ground and surface water proximal to large-scale swine operations. Plaintiffs claim that this study shows that pathogens in manure break down more slowly when incorporated in the ground. The Plaintiffs also state that the MPCA omitted the most pertinent studies in an arbitrary fashion.

The Interim Guidelines are established by the MPCA to define the measures and conditions generally needed to ensure that, to the maximum extent practicable, groundwater is protected when new liquid manure storage systems are constructed in the karst region. Constructing New Manure Storage Systems at 1. Minnesota Rule 7060.0500 states that it is the "policy of the Minnesota Pollution Control Agency to control wastes as may be necessary to ensure that to the maximum practicable extent the underground waters of the state are maintained at their natural quality." Id. Maintaining high quality ground water supplies is challenging in the karst region of southeastern Minnesota due to the rapid transport of contaminants from the land surface to ground water in this unique geologic setting. Id.

Three potential water quality risks associated with liquid manure storage systems in the karst region are described below. Two of the risk factors could lead to long-term (chronic) problems, whereas the third risk factor is associated with catastrophic failure. Id. at 3. The water quality risks include: 1) seepage of contaminants through the liner and underlying soil to fractured bedrock and subsequently to ground water; 2) gradual soil subsidence formation of a shallow sinkhole below the storage structure that breaches the integrity of the liner, causing slow and perhaps indetectable leaking of manure from the storage system to ground water; and 3) larger sinkhole forming below a manure storage system leading to a rapid flow of manure into ground water or causing a collapse in a basin sidewall and a release of manure onto the ground surface. Id. at 3.

Manure entering ground water will discharge into streams within a period of time ranging from hours to decades depending on the site-specific hydrogeology. Id. The karst region of Minnesota maintains a large number of high quality trout streams. A rapid discharge of a large quantity of manure into a stream will destroy the aquatic life for a stretch of the stream and also result in increased nutrient loading into the receiving waters of the Mississippi River system. Id. Manure that travels in the ground water for a longer period before discharging into streams will be more diluted and may not destroy aquatic life, but will threaten drinking water supplies as it travels toward the stream, and then still contribute to

http://www.courts.state.mn.us/districts/third/mpca.htm

1/2/01
stream pollution upon discharge. Id.

Using liners with very low seepage rates can reduce the probability of a soil collapse below a manure storage system. Id. at 4. Risks of failure can also be reduced by such measures as proper siting of the storage facility on the landscape; minimizing the manure storage capacity; preventing excess infiltration of runoff water around the storage facility; and maintaining a certain separation distance between the manure and fractured bedrock. Id.

Between 1974 and 1992, sinkholes opened below three of the twenty-two municipal wastewater treatment ponds in Minnesota's karst region. Id. at 4. These failures demonstrate the potential for sinkholes to develop in southeastern Minnesota when large quantities of liquids are stored in sinkhole prone areas with minimum barriers between the liquid and underlying materials. Id. It is important to consider that the contamination concentration of manure lagoons are often over 100 times greater than municipal wastewater pond liquids, and thus the environmental consequences of a catastrophic manure release could be much worse than municipal pond failures. Id.

Most sinkholes in southeastern Minnesota appear where there is less than 50 feet of soil cover over carbonate and sandstone bedrock. Id. at 5. The risk of soil collapse has generally been found to increase in areas of ponded or intermittently flowing water, and in areas with indication of more extensive karstification, including areas with disappearing streams, caves, springs and solution cavities. Id.

After reading the interim guidelines and reading over the briefs of counsel this Court finds that leaks and seepage can be anticipated. As a matter of fact, it seems to be the norm that these basins do have seepage. This Court finds that the MPCA did not take advantage of any of the data that was available to them. The Guidelines state that there is concern about protecting the groundwater, but there is not a plan to mitigate (or at least none was mentioned) if a sinkhole would form underneath the basin. As stated above, the MPCA does discuss an above ground spill and does have a plan if this were to occur, but nothing is mentioned about below ground spills. As the guidelines point out, the streams, as well as drinking water could be harmed if this were to occur.

As stated above, this Court does find that this is a phased action and therefore, the proposed freestall barn should be included in the evaluation of this site. Given this information and the MPCA's own guidelines, there is not enough separation distance between liquid manure and fractured bedrock to erect these basins on the proposed site.

Conclusions

An RGU's decision is arbitrary and capricious if it: (1) relied on factors the legislature never intended it to consider; (2) entirely failed to consider an important aspect of the problem; (3) offered an explanation for its decision that runs counter to the evidence; or (4) is so implausible that it could not be ascribed to a difference in view or the result of agency expertise. Pope County Mothers at 236. If the RGU's decision represents its will rather than its judgment, that decision is arbitrary and capricious. Id.

The MPCA's decision not to conduct an EIS in this matter is not supported by the record and is arbitrary and capricious. This Court finds that the MPCA failed to consider at least one important aspect of the problem, i.e., the possibility of an underground collapse of the basin. If the basin would collapse how would ground water contamination be stopped? This Court could not find any information in the MPCA's brief to answer this disturbing question. The MPCA should have addressed this issue and they did not.

This Court also finds that the MPCA violated its own interim guidelines by only requiring five feet of separation distance when using a composite liner, instead of the 10 feet required for a facility designed for over 1,000 animal units. This Court, as stated earlier, finds that this is a phased action and therefore it should be held to the standards applied for a project comprised of over 1,000 animal units instead of the 300 to 999 animal units this study was based on.

Plaintiffs have argued that the MPCA decision was improperly influenced by the threats of members of the legislative branch to change the law. Writing and rewriting of the law is what legislatures do. It is not the function of the Court to determine what is or is not proper in discussions between the legislative and executive branches of our government. Furthermore, this Court suspects that the executive branch is fully capable of protecting itself from the legislative branch. This Court doubts that the executive branch needs judicial protection from the legislature.

Obviously this decision does not bar the completion of the proposed project. It does, however, require further evaluation
by the RGU. This Court is mindful that the preparation of an EIS is costly and time consuming, but then, so is litigation. Based on all the information in the file and the law, the Plaintiff’s motion for summary judgment is granted, and Defendant’s motion for summary judgment is denied.

This decision is not meant to, and should not be read as a denigration of the work and investigation completed by the MPCA on this issue. Most of the disputed issues have been resolved in favor of the MPCA. While the Court may not have reached the same conclusions as the MPCA, where these conclusions were based on some reasonable evidence this Court should not intervene. RRB
Gambling on the Karst?
By Mary Losure, Minnesota Public Radio
September 10, 2001

Much of the rolling, picturesque farmland of southeast Minnesota is what geologists call “karst.” The soil is underlain by cracked, water-soluble rock, riddled with underground tunnels and caves. That makes the region’s groundwater highly vulnerable to pollution. Depressions, known as sinkholes, can appear without warning when the underlying rock collapses. Sinkholes act like drains, whooshing water—and contaminants—into underground aquifers.

Now, many local residents are worried as large, industrial-scale feedlots begin to move into the karst region.

Bob and Eloda Wood are retired dairy farmers who do volunteer monitoring of the south branch of the Root River in southeast Minnesota. It’s one of the state’s best trout streams, and flows through Forestville State Park.

Each point, the two drive the winding road from their farm to the stream to collect samples. On a recent day, Eloda Wood pointed out the sinkholes, disappearing stream valleys, and other classic karst features along the way.

“They tell us that much of our surface is like Swiss cheese, and wherever there is vertical crack, that’s an invitation for a sinkhole,” she says.

So the Woods were alarmed when they learned of plans to build a factory-scale feedlot, the Reiland Dairy, just up the valley from Forestville State Park.

The dairy’s earthen-lined manure lagoons would hold more than seven million gallons of manure. If a sinkhole opened up under a lagoon, the Woods and other opponents worry that all that manure would flow into the groundwater. From there it could gush through underground rock tunnels into the Root River, and devastate both it and Forestville State Park.

“Instead of just flooding with water, it would be flooding with manure,” Bob Wood says.

A University of Minnesota karst expert characterized the feedlot’s risk as “enormous.” Both the state Department of Natural Resources and the state Health Department expressed serious concerns, but the Minnesota Pollution Control Agency ruled the project could go ahead.

Opponents, including the Woods, took the PCA to court—and won. In December, a Fillmore County Judge ruled the agency had neglected its duty by failing to consider the catastrophic level of water pollution a sinkhole collapse might cause.

The judge noted that three of the areas 22 municipal sewage lagoons have collapsed, most recently in 1992. And he pointed out that manure lagoons pose a much greater environmental threat than sewage lagoons, since they are often more than 100 times more concentrated.

But PCA officials still insist the project could have gone ahead safely. “That was our decision and is still our decision,” according to Beth Lockwood, the supervisor of the agency’s environmental review program. Lockwood says the agency evaluates only environmental impacts that may be “reasonably expected” to occur from a project, and in the agency’s judgement, a sinkhole breach was too remote a possibility to consider.

“We did not feel that after the engineering was all designed, and we looked at the project as a whole and how it was designed and engineered, that we reasonably expected a catastrophic release to happen,” according to Lockwood.

The PCA did not appeal the judge’s decision, and proposers of the dairy decided to move it to another area. But it’s likely more lagoons will be proposed in the karst region, as dairy farmers there expand their operations. That could cause problems.

Manure lagoons have caused massive water contamination in North Carolina, the state where they were first widely used. They are now banned there.

Minnesota has banned them for hogs, but still allows them for dairies.

In Minnesota’s karst geology, dairy manure lagoons are permitted as long as there are no more than four sinkholes within a 1,000 feet and the bedrock is more than 10 feet down. In addition, lagoons may not be built within 300 feet of any sinkhole. Hog manure pits must be lined with cement.

If they meet those regulations, the only thing stopping big feedlots in the karst is local opposition. And that isn’t always as effective as it was in the Reiland case.

“We’re right in the middle of three big outfits,” laments Kermit Burt, whose parents own Burt’s Hilltop Poultry, a small poultry processing plant surrounded by a large turkey farm and two industrial-scale hog operations.

Now the Burts worry about their well. “What’s going to happen if our well does suddenly shoot sky high in nitrates and we’ve got to replace it? Who’s going to cover it?”

The Burts and other neighbors fought hard against the most recently built hog feedlot. Until this summer, they thought they’d stopped it.

The feedlot was not large enough to require mandatory review by the PCA, but the county board had denied it a permit because it would sit in a high-risk karst area.

The Minnesota State Court of Appeals upheld the county’s decision, ruling that “the proposed feedlot presents legitimate public health concerns.”

But this June, neighbors like Dale Pierce learned it was going up anyway. “We thought that because it was all denied by the county officials and even the state Court of Appeals, that it would not go any further. But then they changed the way animal units are counted, and one person was able to approve the permit, and we’ve got the building now and we can’t do a darn thing about it,” says neighbor Dale Pierce.

A little-noticed change in the county’s regulations had put the proposed feedlot just under the size limit for environmental review by the county.
Bobby King, an organizer for the family farm group The Land Stewardship Project in Lewiston, says with the weakened county regulations, there’s not much they can do. "Now we’re relying basically on the PCA to look out for a facility that size to make sure it’s safe. And we know they’re not doing the job," King says.

But others, like State Sen. Kenric Scheevel, R-Preston, say blanket opposition to big feedlots in karst terrain is misguided. The area has traditionally been home to small-scale livestock operations, and Scheevel if such farmers can’t expand, they’ll get out of the livestock business. He says that would mean hilly terrain that’s traditionally been used for pasture, would be plowed up and planted in row crops like corn and soybeans, which would greatly increase soil erosion.

"Frankly, a lot of those hills will end up in our waterways, because farmers are going to use their land; they’re not going to just iddle it. They’re in the business of producing either crops or livestock," Scheevel says.

Scheevel says large feedlots can be built safely, as long as they’re properly located. "There is a certain level of risk to anything you build in the karst region," he says, "but you can also map out the sinkhole plains, and you find that there are regions in which the sinkholes tend to follow a specific pattern. You get away from those sinkhole plains, and the risk of a sinkhole opening up is probably minimal, if not almost irrelevant."

But others are not convinced the risks are minimal, especially if more and more factory-style farms move into the karst region.

The State Health department has asked the PCA to develop guidelines for emergency response plans in the area to handle possible catastrophic spills.

RISKY TERRAIN
Karat geology underlies many of Minnesota’s existing dairy operations. As farms on the karst expand, more manure lagoons may be built on the region’s fragile geology.

(Karat map courtesy of E. Calvin Alexander Jr., and Yongli Gao, University of Minnesota department of geology. Copyright 2001. (See map)

Dairy operations map courtesy of Land Management Information Center, Minnesota Office of Strategic and Long Range Planning. Source: Minnesota Department of Agriculture) (See map) To view this map, you will need the, Adobe Acrobat Reader.
Historic Mega-Rain Events in Minnesota

Minnesota is no stranger to heavy rain events. The early surveyors mapping out the state witnessed such events.

The DNR climate office has assembled a list of so-called "Mega-rain" events that have occurred since statehood. These are events in which six inches of rain covers more than 1000 square miles and the core of the event topped eight inches. Rainfalls of of this magnitude and geographic extent have the potential to become catastrophic. Using newspaper accounts, diaries, and the historical climate record, 15 such events in Minnesota's post-settlement history have been identified. However, our ability to detect these events has improved dramatically since the 1970s.

The number of daily rainfall observers in Minnesota exploded in the early 1970s, thanks to the foresight and ambitions of Dr. Don Baker, and then-State Climatologist Earl Kuehnast. Since that period, the state has benefited from an unusually dense network of observations (/climate/summaries_and_publications/appliedmain.html). This network has remained intact, plus or minus year-to-year changes, and has enabled climatologists to identify mega-rainfall events that undoubtedly would have been missed during periods of much sparser observations.

Thus, the State Climatology Office considers the "stable" period of record to stretch from 1973 through present. Any given year during that period has roughly the same chance of capturing (or missing) an actual mega-event. The years prior to 1973, however, are likely to have some number of missing events.

If we examine the period 1973-2016, Minnesota has seen eleven mega-rains, with a sharp uptick since 2000, despite a small decrease in observer numbers. Of these 11 events, two were in the 1970s, one was in the 1980s, none were in the 1990s, but four occurred in both the 2000s, and the 2010s (still underway). Thus, the 18 years from 2000-2017 have seen nearly three times as many mega-rains as the 27 years spanning 1973-99. Although it is difficult to assess the statistical significance of that rapid increase, we do know that these trends are consistent with the expectation that Minnesota and the Upper Midwest will receive more precipitation, and more precipitation from large events (http://nca2014.globalchange.gov/report/regions/midwest#graphic-17083), in response to increasing global temperatures and increased available moisture for passing storm systems.

Documented Mega-Rains in Minnesota

(There may be other events prior to 1973 that require further investigation such as September 11-15, 1903 (https://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/COEsto
• **August 6, 1866 Southern Minnesota**

Also known as the *Wisel Flood*, this event killed 16 people, including 3 members of the Wisel family in Fillmore County. 10.30 inches of rain fell at the Sibley Indian Agency located in Sibley County. The story of the Wisel family in peril appeared in the Harmony/Mabel/Canton News Record Newspaper.

• **July 17-19 1867 Central Minnesota**

Climatologists and historians believe this to be Minnesota's most extreme flash flood of the past 200 years. In his *Minnesota Weather Almanac*, Mark Seeley referred to this event as "Minnesota's Greatest Thunderstorm." Torrential rains pounded portions of west-central Minnesota relentlessly. Unfortunately, the rains escaped direct measurement, but astute observers of the time estimated from unobstructed upright barrels and other such containers, that 30-36 inches of rain fell in 36 hours. No official observation in Minnesota has come anywhere near those magnitudes. The few surviving details of the storm back up the claims, however, as the flooding that resulted was unimaginable and catastrophic. Most of what we do know about this event comes from a paper [PDF](http://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/n) that was read before the Minnesota Academy of Sciences on March 7, 1876. Climate Historian Tom St. Martin [summarized](http://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/1) the event as well.

• **July 20-22, 1909 Northern Minnesota**

Extensive flood event from Northwest Minnesota to the UP of Michigan [PDF](http://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/C). Highest one day rainfall total was 10.75 inches at Beaulieu in Mahnomen County (11.10 inches for the three day total.) This storm also did extensive damage in Duluth and killed two children in the city when they were swept out of their mother's arms.

• **September 9-10 1947, Iron Range**

24 hour totals of 6 inches or more at Hibbing, Ely and Winton. Unofficial report of 8.60 inches in five hours at Hibbing. Extensive damage over the Iron Range district.

• **July 21-22, 1972 Grand Daddy Flash Flood**

10.84 inches fell in 24 hours was set at Fort Ripley [PDF](http://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/fi). This was the state record for a highest 24 hour total at a National Weather Service station until Hokah broke the record in 2007.
- **June 28-29 and July 1-2, 1975, Northwest Minnesota**

Geographically extensive and intense rains fell on eastern North Dakota and Northwest Minnesota in two separate events.

- **July 23-24, 1987 Twin Cities Superstorm**

Greatest calendar day precipitation on record for Twin Cities International Airport with 9.15 inches.

- **June 9-10, 2002 Northern Minnesota**

48 hour rainfall totals topped 12 inches in some areas of Roseau and Lake of the Woods counties.

- **June 22-23, 2002 Northern Minnesota**

This event was so large, two different parts of northern Minnesota met the mega-rainfall definition used here.

- **September 14-15, 2004 Southern Minnesota**

More than ten inches of rain fell in a 36 hour period in Faribault and Freeborn Counties.

- **August 18-20, 2007 Southern Minnesota**

Although the 1867 storm detailed above likely produced higher totals, the 15.10 inches measured one mile south of Hokah stands as the official record for 24-hour rainfall at a Minnesota National Weather Service Cooperative station. The three day total for this station was 16.27 inches.

- **September 22-23, 2010 Southern Minnesota**

The National Weather Service site in Amboy measured 9.48 inches on September 23, with 10.68 inches for the event.

- **June 19-20, 2012 Northeast Minnesota**

The two day total at Duluth was 7.24 inches. The St. Louis River at Scanlon set a new record crest at 16.62 feet, rising 10 feet in 24 hours.

- **July 11-12, 2016, East-central Minnesota**
Extreme rainfall affected a swath from the Brainerd Lakes area, eastward into Pine County (climate/journal/160711_12_flood.html) (and also well into Wisconsin). Clovorton in Pine county recorded 9.34 inches.

- **August 10-11, 2016, Central Minnesota, Southeastern Minnesota**

  Two distinct areas received over 6 inches of rainfall (climate/journal/160810_11_flood.html): one near Willmar, and another in Wabasha County. The highest total of 9.74 inches was recorded just east of Willmar.

For more information contact: climate@umn.edu (mailto:climate@umn.edu)

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Questions?

Call 651-296-6157 or 888-MINNDNR (646-6367)

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The Minnesota Department of Agriculture (MDA) has designed a Township Testing Program to determine current nitrate-nitrogen concentrations in private wells. The initial criteria used to select townships for testing is based on the percentage of township land vulnerable to groundwater contamination (30% or greater) and amount of land in row crop production (20% or greater). The MDA uses the final results to determine if additional action is needed to minimize potential sources of nitrate pollution in the state’s groundwater.

Program testing and the summarizing of results are ongoing. Tables were created with current data, 3/22/2018.

**Table 1: Final Township Testing Results***

<table>
<thead>
<tr>
<th>County</th>
<th>Number of Townships Tested</th>
<th>Final Well Dataset</th>
<th>Number of Townships with Wells Over the Health Risk Limit (≥10 mg/L Nitrate-N)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Benton</td>
<td>3</td>
<td>472</td>
<td>1</td>
</tr>
<tr>
<td>Dakota</td>
<td>15</td>
<td>1179</td>
<td>4</td>
</tr>
<tr>
<td>Morrison</td>
<td>11</td>
<td>1104</td>
<td>3</td>
</tr>
<tr>
<td>Olmsted</td>
<td>11</td>
<td>923</td>
<td>10</td>
</tr>
<tr>
<td>Otter Tail</td>
<td>21</td>
<td>2276</td>
<td>15</td>
</tr>
<tr>
<td>Pope</td>
<td>6</td>
<td>283</td>
<td>6</td>
</tr>
<tr>
<td>Sherburne</td>
<td>6</td>
<td>1992</td>
<td>0</td>
</tr>
<tr>
<td>Stearns</td>
<td>14</td>
<td>1788</td>
<td>8</td>
</tr>
<tr>
<td>Wadena</td>
<td>4</td>
<td>224</td>
<td>1</td>
</tr>
<tr>
<td>Washington</td>
<td>2</td>
<td>441</td>
<td>0</td>
</tr>
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</table>

**Table 2: Initial Township Testing Results-Final Township Testing Results are Not Yet Available***

<table>
<thead>
<tr>
<th>County</th>
<th>Number of Townships Tested</th>
<th>Number of Wells</th>
<th>Number of Townships with Wells Over the Health Risk Limit (≥10 mg/L Nitrate-N)</th>
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<td></td>
<td></td>
<td></td>
<td>&lt;5%</td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Clay</td>
<td>11</td>
<td>1159</td>
<td>7</td>
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<tr>
<td>Goodhue</td>
<td>22</td>
<td>2071</td>
<td>2</td>
</tr>
<tr>
<td>Fillmore</td>
<td>24</td>
<td>1477</td>
<td>3</td>
</tr>
<tr>
<td>Rice</td>
<td>4</td>
<td>478</td>
<td>1</td>
</tr>
<tr>
<td>Wabasha</td>
<td>14</td>
<td>1087</td>
<td>0</td>
</tr>
</tbody>
</table>

| 2015-2016|                           |                | 11   | 0     | 0      | 0      | 0       |
| Becker   | 3                         | 200             | 0    | 1     | 2      | 0      | 0       |
| Benton   | 1                         | 321             | 0    | 1     | 0      | 0      | 0       |
| Dodge    | 7                         | 654             | 3    | 1     | 3      | 0      | 0       |
| Douglas  | 9                         | 1864            | 7    | 2     | 0      | 0      | 0       |
| Hubbard  | 6                         | 1106            | 1    | 2     | 3      | 0      | 0       |
| Kandiyohi| 4                         | 313             | 1    | 3     | 0      | 0      | 0       |
| Nobles   | 4                         | 45              | 0    | 0     | 0      | 0      | 0       |
| Otter Tail| 11                        | 2160            | 9    | 2     | 0      | 0      | 0       |
| Rock     | 7                         | 171             | 0    | 0     | 0      | 0      | 0       |
| Todd     | 9                         | 797             | 4    | 5     | 0      | 0      | 0       |
| Winona   | 13                        | 940             | 2    | 2     | 5      | 1      | 1       |
* The initial township testing results include data from all wells initially tested. An optional follow-up testing and well survey is offered to homeowners that have a presence of nitrate in their initial sample. Wells with nitrate-nitrogen results over 5 mg/L and a nearby non-fertilizer source or identified well problem are removed. The remaining wells form the final township testing well dataset.

** Additional information for these townships is available in Table 3.

Table 3: Townships with > 40% of Wells Exceeding the Health Risk Limit (> 10 mg/L Nitrate-N)

<table>
<thead>
<tr>
<th>Final Township Testing Results</th>
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<tbody>
<tr>
<td>County</td>
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<tr>
<td>Dakota</td>
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<tr>
<td>Morrison</td>
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<tr>
<th>Initial Township Testing Results</th>
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<tbody>
<tr>
<td>County</td>
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</tr>
<tr>
<td>Winona</td>
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<tr>
<td>Winona</td>
</tr>
</tbody>
</table>

Additional Information
Township Testing Program: [www.mda.state.mn.us/townshiptesting](http://www.mda.state.mn.us/townshiptesting)

Minnesota Nitrogen Fertilizer Management Plan (NFMP): To learn more about the NFMP, the state's blueprint for preventing or minimizing impacts of nitrogen fertilizer on groundwater, visit: [www.mda.state.mn.us/nfmp](http://www.mda.state.mn.us/nfmp).

Funding Acknowledgement
Funding for this project is provided by the Clean Water, Land and Legacy Amendment.

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.

March 2018
Winona County: Final Overview of Nitrate Levels in Private Wells (2016-2017)

The Minnesota Department of Agriculture (MDA) determines current nitrate-nitrogen concentrations in private wells, on a township scale, through the Township Testing Program. The MDA has identified townships throughout the state that are vulnerable to groundwater contamination and have significant row crop production. The MDA plans to offer nitrate testing to more than 70,000 private well owners in over 300 townships by 2019.

Each selected township is offered testing in two steps, the “initial” sampling and the “follow-up” sampling. In the initial sampling, all township homeowners using private wells are sent a nitrate test kit. If nitrate is detected in their initial sample, the homeowner is offered a follow-up nitrate test, pesticide test and well site visit. Trained MDA staff visit willing homeowners to resample the well and then conduct a site assessment. The assessment helps to identify possible non-fertilizer sources of nitrate and to see the condition of the well. A well with construction problems may be more susceptible to contamination.

The MDA and Winona County Environmental Services worked together to select townships and implement the nitrate testing project. The following townships were selected: Elba, Fremont, Hart, Hillsdale, Mt. Vernon, Norton, Pleasant Hill, St. Charles, Saratoga, Utica, Warren, Wilson, and Wiscoy. The initial sampling in Winona County started in 2016 and follow-up sampling ended in 2017.

Results
Two datasets are used to evaluate nitrate. The initial well dataset contains 940* wells; the final dataset contains 731 wells. Wells that had nitrate-nitrogen results over 5 mg/L were removed from the initial dataset if a non-fertilizer source or well problem was identified, to form the final well dataset. A total of 209 wells (22%) were removed. The results from the initial and final well datasets are summarized in the table below.

In Fremont, Saint Charles, Utica, and Warren Townships, more than 10% of the wells were over the Health Risk Limit of 10 mg/L of nitrate-nitrogen (map below). The percent of wells over the Health Risk Limit in each township ranged from 0% to 42.9%. The Winona County Final Report will be available on the MDA website in 2018: www.mda.state.mn.us/townshiptesting.

Next steps
The MDA uses the final well dataset to determine if additional action is warranted, as described in the Minnesota Nitrogen Fertilizer Management Plan (NFMP). The MDA uses the assessment process and prioritization guidelines in the NFMP to determine next steps. Find more information about the NFMP on the MDA website at www.mda.state.mn.us/nfmp.

Funding Acknowledgement
Funding for this project is provided by the Clean Water, Land and Legacy Amendment

Published May 2018
Table: Winona County Private Well Nitrate Results, 2018.

<table>
<thead>
<tr>
<th>Township</th>
<th>Initial Well Dataset</th>
<th>Final Well Dataset</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Total Wells*</td>
<td>Percent of Wells ≥10 mg/L Nitrate-Nitrogen</td>
</tr>
<tr>
<td>Elba</td>
<td>62</td>
<td>16.1%</td>
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<tr>
<td>Fremont</td>
<td>42</td>
<td>54.8%</td>
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<tr>
<td>Hart</td>
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<tr>
<td>Hillsdale</td>
<td>52</td>
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<tr>
<td>Mt. Vernon</td>
<td>33</td>
<td>15.2%</td>
</tr>
<tr>
<td>Norton</td>
<td>80</td>
<td>11.3%</td>
</tr>
<tr>
<td>Pleasant Hill</td>
<td>58</td>
<td>8.6%</td>
</tr>
<tr>
<td>St. Charles</td>
<td>85</td>
<td>34.1%</td>
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<tr>
<td>Saratoga</td>
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<td>19.6%</td>
</tr>
<tr>
<td>Utica</td>
<td>86</td>
<td>46.5%</td>
</tr>
<tr>
<td>Warren</td>
<td>92</td>
<td>28.3%</td>
</tr>
<tr>
<td>Wilson</td>
<td>196</td>
<td>6.1%</td>
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<tr>
<td>Wiscoy</td>
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<td>0.0%</td>
</tr>
<tr>
<td>Total</td>
<td>940</td>
<td>19.1%</td>
</tr>
</tbody>
</table>

* All well types included.

Figure: Winona County Final Well Dataset Map, 2018.
Animal Manure Management

RCA Issue Brief #7 December 1995

What are organic by-products, and how are they quantified?
How much manure can actually be collected?
How much manure do different types of livestock produce?
Recoverable manure, by livestock type
What natural resource problems are associated with manure management?
What are the trends in manure production?
Animal population summaries, 1994
What can be done?
How does manure management help?

Did you know ...

...that the manure from a dairy milking 200 cows produces as much nitrogen as is in the sewage from a community of 5,000-10,000 people? Or that the annual litter from a typical broiler house of 22,000 birds contains as much phosphorus as is in the sewage from a community of 6,000 people?

...that any increase in animal numbers results in an equal increase in the problems arising from manure collection, storage, treatment, and utilization?

...that beef production in the United States decreased almost 15 percent between 1982 and 1992, while broiler production increased 59 percent and turkey production increased 62 percent, with a corresponding increase in manure and other residual materials?

Words are important!

Richard Kashmanian, in an editorial for BIOCYCLE, stresses the importance of words. He points out that words such as "wastes," "garbage," and "trash" send negative signals to readers or listeners and set in motion a sequence of events that is difficult to reverse.

The following definitions are taken from Webster's New Collegiate Dictionary: "Waste: garbage, rubbish, discarded as worthless, defective, or of no use." Dispose: "to get rid of." Various synonyms listed in Webster's New World Thesaurus for waste are "garbage, refuse, filth, litter, debris, and junk." Not very attractive!

Efforts are underway by various groups to change the vocabulary used to define their products or services. For example, the American Forest and Paper Institute is discontinuing the use of the term "waste paper" when referring to recycled paper. The Water and Environment Federation, formerly the Water Pollution and Control Federation, is using the term "biosolids" to refer to or define the largely organic material commonly called "sludges."

More and more, the agricultural sector recognizes that the reference to livestock manure as livestock "waste" has helped lead to the undervaluation of manure as a source of nutrients, the loss of manure nutrients through mishandling and misapplication, and the overapplication of manure to the land. Understanding that a term's use implies a value, the agricultural sector can replace the use of the word "waste" with "manure," "residuals," or "by-products."

What are organic by-products, and how are they quantified?

Organic by-products, or "wastes," of the livestock industry include a variety of materials such as solid and liquid animal manures, used bedding, spilled feed, and a variety of other substances. Most livestock-associated organic by-products are animal manures.

The amount and consistency of manures varies with animal type, climate, feed ration, animal age and health, and other factors. To compare manure production between animal types or between animals of the same type, manure production is expressed in terms of 1,000-pound animal units. For reference, a single dairy cow weighs about 1,400 pounds, or 1.4 animal units. A typical steer weighs about 1,000 pounds, or 1 animal unit, and most hogs weigh between 200 and 300 pounds, or 0.2 to 0.3 animal unit. A mature broiler, on the other hand, weighs between 4 and 5 pounds, so it takes as many as 250 birds to make up an animal unit.
Nitrate in Well Water
Well Management Program

Introduction
Nitrate is a common contaminant found in many wells in Minnesota. Too much nitrate in drinking water can cause serious health problems for young infants. This page provides a basic explanation of nitrate in wells and gives steps that you as a well owner can take to protect your family and visitors from illness.

What is nitrate?
Nitrate (NO₃⁻) is a naturally occurring chemical made of nitrogen and oxygen. Nitrate is found in air, soil, water, and plants. Much of the nitrate in our environment comes from decomposition of plants and animal wastes. People also add nitrate to the environment in the form of fertilizers.

How does nitrate get into well water?
Natural levels of nitrate in Minnesota groundwater are usually quite low (less than 1 milligram per liter [mg/L] of nitrate-nitrogen). However, where sources of nitrate such as fertilizers, animal wastes, or human sewage are concentrated near the ground surface, nitrate may seep down and contaminate the groundwater. Elevated nitrate levels in groundwater are often caused by run-off from barnyards or feedlots, excessive use of fertilizers, or septic systems.

Wells most vulnerable to nitrate contamination include shallow wells, dug wells with casing which is not watertight, and wells with damaged, leaking casing or fittings.

Nitrate contamination of a well is often regarded as a first sign of deteriorating groundwater quality.

What are the health risks of nitrate in well water?
Too much nitrate in drinking water poses a risk to infants under six months of age. If an infant is fed water or formula made with water that is high in nitrate, a condition called "blue baby syndrome" (or "methemoglobinemia") can develop. Bacteria which are present in an infant's stomach can convert nitrate to nitrite (NO₂⁻), a chemical which can interfere with the ability of the infant's blood to carry oxygen. As the condition worsens, the baby's skin turns a bluish color, particularly around the eyes and mouth. If nitrate levels in the water are high enough and prompt medical
attention is not received, death can result. See also [http://www.health.state.mn.us/divs/eh/wells/waterquality/safebaby.html]: Safe Drinking Water For Your Baby
(http://www.health.state.mn.us/divs/eh/wells/waterquality/safebaby.html).

Why are young infants more susceptible?
As an infant ages, its stomach acidity increases, reducing the numbers of nitrite-producing bacteria. After six months, the conversion of nitrate to nitrite in the stomach no longer occurs. Most adults can consume large amounts of nitrate with no ill effects. In fact, the average adult in the United States consumes about 20-25 milligrams of nitrate-nitrogen every day in food, largely from vegetables.

Pregnant women, people with reduced stomach acidity, and people with certain blood disorders may also be susceptible to nitrate-induced methemoglobinemia. Some research has suggested that nitrate may also play a role in the development of some cancers. However, at this time there is no clear evidence that nitrate ingestion results in an increased cancer risk.

How much nitrate is too much?
The federal drinking water standard for nitrate is 10 mg/L of nitrate-nitrogen, which provides newborns with reasonable protection against blue baby syndrome. This level is mandatory for all public water systems, and recommended for private wells.

How do I know if my well water has nitrate?
Nitrate is tasteless, odorless, and colorless. To find out if there is nitrate in your water, have it tested by a laboratory that is certified for nitrate testing by the Minnesota Department of Health. Laboratories will provide sampling bottles and instructions. Visit the Environmental Laboratory Accreditation Program (https://eldo.web.health.state.mn.us/public/accreditedlabs/labsearch_seam) website for all your water testing needs. Regardless of which tests you want done, always make sure to use a laboratory that has been certified to perform each of those particular tests.

How often should I have my well tested for nitrate?
It's a good idea to have a routine nitrate test every two or three years, more frequently if nitrate has been detected in previous sampling. State regulations require well contractors to have a water sample tested for bacteria and nitrate when they construct a new well. After that, owners of private wells must arrange for their own water testing.

You should also have your water tested for nitrate if you are a woman planning on becoming pregnant or if infants will be using the water.

What if nitrate is found in my water?
1. If the nitrate-nitrogen concentration exceeds the health limit of 10 mg/L, do not give the water to any infant under six months of age, either directly or in formula. Infants should be provided with water from a source which has been tested and shown to be low in nitrate and bacterially safe. Commercially bottled water is required to meet the nitrate standard.
2. Do not boil to "treat" high nitrate water. Nitrate is not removed from the water by boiling. Boiling actually concentrates the nitrate, due to evaporation of the water.
3. Have your well inspected. It's a good idea to have your well inspected by a licensed well contractor if the well is old, or you do not know if it is structurally sound. Nitrate and bacteria problems are sometimes caused by structural flaws which allow contaminated surface water to enter the well. Repairing the well or constructing a new, deeper well often results in a results in a significant reduction in the nitrate level. To find licensed well drillers (http://www.health.state.mn.us/divs/eh/wells/lwc/index.html) in your area, look in the Yellow Pages under "Well Drilling and Service."
4. Identify and remove sources of nitrate near the well. Fertilizers, animal wastes, and sewage systems should be located and managed so that they do not contaminate the well. If a nitrate source is too close to the well and
cannot be moved, then you may need to consider having the well permanently sealed and replaced by a licensed well contractor.

What about a water treatment unit?
Home water treatment units are not recommended for treating high nitrate water which will be given to infants. There is no foolproof way of knowing when the treatment system may fail, and blue baby syndrome has been known to occur after just one day of exposure to high nitrate water.

Should I test my well for anything other than nitrate?
Yes. Private wells should be tested at least once a year for bacterial safety. It is also wise to test well water for bacteria any time the water changes in taste, odor, or appearance. See also: Bacterial Safety of Well Water (http://www.health.state.mn.us/divs/eh/wells/waterquality/bacteria.html).

In addition, water can absorb lead from old lead pipes, lead-soldered copper pipes, or brass plumbing components, when the water stands idle in the pipes for more than a few hours. It is recommended to either flush standing water until you feel the water get colder (usually 30-60 seconds), or have your water tested for lead after it has been standing in the pipes at least six hours. Also, never use water from hot water faucets for drinking or cooking. See also: Lead in Well Water Systems (http://www.health.state.mn.us/divs/eh/wells/waterquality/lead.html).

Arsenic occurs naturally in about half the wells in Minnesota, and about 10 percent of wells produce water which exceeds 10 micrograms per liter (parts per billion), the federal drinking water standard. Arsenic is more prevalent in western Minnesota, but can occur almost anywhere in the state (see map on arsenic occurrence (http://www.health.state.mn.us/divs/eh/wells/waterquality/arsenicmap.pdf)). Long-term consumption of arsenic above the drinking water standard may increase the risk of health problems of the skin, circulatory system, nervous system, lungs, and bladder, including some forms of cancer. Every private well should be tested at least once or twice to determine if arsenic is present in the water. See also: Arsenic in Minnesota’s Well Water (http://www.health.state.mn.us/divs/eh/wells/waterquality/arsenic.html).

Other contaminants sometimes occur in private water systems, but much less frequently than bacteria, nitrate, arsenic, or lead. If the well is located close to fuel tanks or to a commercial or industrial area, a test for "volatile organic chemicals" (VOCs) is a good idea. A brochure, VOCs, is available from the MDH. Agricultural chemicals are sometimes found in wells located near cropped fields or handling areas for agricultural chemicals. Shallow wells are more vulnerable to pesticide contamination than are deep wells. If your well is located in an agricultural area, and especially if it is a shallow well, testing for several of the pesticides most commonly used in the area may be warranted.

If children or adolescents are drinking the water, a test for natural levels of fluoride will give your dentist useful information when considering fluoride supplements. A small number of wells in Minnesota (primarily northeastern Minnesota) do have naturally-occurring levels of fluoride that exceed the health standard.

Questions?
Contact the MDH Well Management Section
651-201-4600 or 800-383-9808
health.wells@state.mn.us

Minnesota Department of Health
Updated Thursday, June 28, 2018 at 10:18AM
Dear Mr. Gernes,

I am writing to express my opposition to the Daley Farm expansion. This proposed expansion is just not right for our county given its karst topography. I ask that the NPDES application be Denied, especially since the farm is already out of compliance. I would also like you to know that we are requesting a Contested Case Hearing. We feel very strongly about this issue and expect your attention.

Jane Cowgill
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.
The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult to trust that the MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

Sincerely,

Mary Tacheny
170 Good Counsel Drive, Mankato MN
Mankato, MN 56001-3138
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion will make this a HUGE dairy operation and that means we need a real in-depth look at the environmental consequences.

The amount of liquid manure and wastewater this will produce is very concerning. Smaller operations have struggled to manage their waste produce, and I do not think allowing an operation like this over karst geology makes any sense from a groundwater perspective.

An EIS is the minimum of due diligence we should do before this farm is allowed to begin operation.

Sincerely,

Madeline Neenan
3623 Elliot Ave
Minneapolis, MN 55407
Dear Ms Grosenheider:

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Sincerely,

John Zschetsche
1311 Bpxelder St.
Mountain Lake, MN 56159
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Sincerely,

Eva Barr
17289 County 8
Wykoff, MN 55990-2134
John Stine, Commissioner, MPCA

Dear Commissioner Stine:

This is to support the requests for an Environmental Impact Statement for the proposed dairy (feedlot) expansion sought by Daley Farms of Lewiston, Winona County.

Most of the key points have been well made by Land Stewardship Project members and don't need repetition by me.

The project would annually use 92 million gallons of water. The city of Lewiston (pop. 1,564) uses about 33 million gallons of water per year.

From the EAW: "Daley received DNR's preliminary approval letter to construct the new wells for the Project on October 30, 2017. The DNR has stated in the preliminary approval letter, that DNR has 'determined that the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands.' Also, "The DNR's preliminary approval to construct a well is not an approval to use or pump the well." Thus, it does not seem to be established that the proposed withdrawals would be sustainable.

The proposal would annually produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from surface water deep into the ground.

Lewiston's municipal sewage lagoon disappeared into a sinkhole in 1991. What if one of the multi-million gallon lagoons at this project disappears into a sinkhole? The municipal lagoon in Altura failed due to a sinkhole in 1976. The same thing happened in Bellechester in 1992.

Well testing conducted by the Minnesota Department of Agriculture in 2016 showed that 46.3 percent of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates.

According to the USDA Natural Resources Conservation Service, 250 cows produce as much nitrate/nitrogen as 5,000 people. By that count, the 4,628-cow Daley Dairy would conservatively produce as much nitrate/nitrogen as a town of 90,000 people. Citation: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211

The proposed manure basin would have a surface area equal to 3.3 football fields – and it's designed to be 16-feet deep.

Winona County has, since 1998, limited feedlots to 1,500 animal units. This cap acknowledges the reality that, in karst country, there is a limit to how many animals you can sensibly pack into one location when you are storing liquid manure in lagoons. The Daleys' farm was over the 1,500-animal unit cap at the time the ordinance was adopted and so was "grandfathered" in. This means it could continue but could not expand (increase its non-conformity). The application, as I understand it, is for 5968 animal units, 3.98 times the county cap.

Serious questions have been raised about the scheduling of the Oct 16 meeting, ostensibly held by the MPCA,
and whether it was not arranged to minimize public participation. If the applicants were acting in good faith and confident of community support they would presumably not need to use these tactics. Nor would they be litigating against expansion of the public comment period.

As you know, an EAW is intended to be a brief screening document used to help decide whether an EIS is necessary. It is clear that the impact of the proposed facility would be substantial, in an area already impacted by other feedlot operations. Thus the need for an EIS seems apparent and indisputable. Please order one.

It hardly needs to be said that such massive feedlot operations are profoundly unsustainable from a "climate" point of view.

Yours very truly,

Alan Muller
1110 West Avenue
Red Wing, MN 55066
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400’ X 400’ X 16’ manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on
our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley’s existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult to trust that the MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

Sincerely,

Peg Zahorik
P.O. Box 127
Knife river, MN 55609
From: j lenczewski <jlenczewski@comcast.net>
Sent: Thursday, November 15, 2018 4:34 PM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Daley Farms EAW

Please see attached.

John P. Lenczewski
Executive Director
Minnesota Trout Unlimited
P.O. Box 845
Chanhasen, MN 55317
612-670-1629
jlenczewski@comcast.net
November 15, 2018

Kim Grosenheider
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155
kim.grosenheider@state.mn.us  

via electronic mail

Re: Daley Farms of Lewiston, LLP – 2018 Dairy Expansion  
Comments on the EAW and need for an EIS

Dear Ms. Grosenheider:

I am writing on behalf of Minnesota Trout Unlimited and its several thousand members to express our concerns over the proposed expansion of the Daley Farms feedlot near Lewiston, Minnesota. Because the information provided as part of the Environmental Assessment Worksheet for this project makes it clear that the project will have significant environmental effects, we urge the MPCA to follow state law and require the preparation of an Environmental Impact Statement (EIS).

Minnesota Trout Unlimited is a grassroots conservation organization with several thousand members in six chapters around the state. We work to protect, restore, reconnect and sustain coldwater fisheries and their watersheds. In the past seven years we focused more than One Million Dollars restoring habitat in and along more than four miles of stream in the Rush Creek watershed and more than three miles of stream in the Garvin Brook watershed. Next summer we will restore habitat on an 8,000 foot segment of the South Branch of the Whitewater River downstream from the project site. Many of our members live in the Rush Creek, Whitewater River and Peterson Creek/Garvin Brook sub watersheds which will be impacted by the proposed project. Hundreds more fish these streams ever year and pump thousands of dollars into the local communities. In short, we are deeply invested in restoring and protecting the high quality trout fisheries found in these special streams.

We pride ourselves on working closely with the agricultural producers who live and work along these streams to restore good trout habitat while accommodating the needs of working farms. Local farmers are valued partners and we appreciate the many challenges they face turning a
profit year after year. In addition, some of our members know members of the Daley family and can attest to the fact that they are good people and good farmers. So it is with some trepidation that we write to share our concerns about the significant environmental effects which the proposed expansion of the Daley Farms’ feedlot operation would likely have. We hope these comments will be received with an open mind and spur agreement that further study is needed to make sure this significant expansion is a sustainable use of the land and water.

Given the scale of the project and its location on sensitive soils at the headwaters of these three top notch trout streams we believe that the project as proposed is very likely to have significant adverse impacts on the wells, aquifers and trout streams in the area. Given the information gaps in the EAW materials we cannot say how large the impacts will be and to what degree they could be avoided. However, the information provided does indicate that significant environmental effects are likely. Consequently, preparation of an EIS is warranted.

The information provided in the EAW appears to be accurate, but it is incomplete in several important areas and warrants further investigation. There are significant impacts that are reasonably expected to occur that warrant further investigation via an EIS. Most important from a water resources standpoint is the inevitable pollution of the aquifers and trout streams from manure applications.

A few major gaps or flaws in analysis are listed below:

The EAW fails to consistently factor in that the entire area of the operation, especially the manure application areas, is on relatively shallow soils over fractured bedrock, which provides an easy pathway for pollutants and bacteria to leach into wells, aquifers and eventually the trout streams.

The EAW indicates that at the manure application sites the depth to groundwater averages just 6.5 feet and depth to bedrock is less than 10 feet. The average depth to bedrock is “unknown”. The soils maps are of little help, since they flag only areas where bedrock is 40 inches or less and tell us nothing about the vast majority of soil depths. The bulk could be less than 50” for all we know. Given that the depth to groundwater averages just 6.5 feet, the cumulative impact of applying 46,000,000 gallons of manure annually needs to be determined. Furthermore, the amount and impact should be determined for each sub watershed (Whitewater, Garvin, and Rush).

The degree to which the underlying bedrock is fractured at the manure application sites is another significant unknown. Only the largest fractures will appear as sinkholes. Yet the ability of pollutants to enter wells, aquifers and streams increases exponentially where extensive fractures exist. This warrants closer study.
The EAW also fails to adequately examine the impacts on both runoff and leaching rates of a major precipitation event.

The adequacy of the feed pad runoff basin also needs closer analysis. The EAW indicates that the liquid level in the feed pad runoff basin will be managed so that sufficient storage is available “for the runoff volume generated by a 25-year 24-hour storm event (5.4 inches).” But larger rain events are all too common and it is likely that larger precipitation events will occur within the next 5 to 10 years. Has MPCA or the project proposer examined precipitation records from the past 10 years to determine how many times more than 5.4” fell within a 24 hour period? And what about the slightly smaller events that followed heavy rains which had saturated the soils?

The EAW failed to adequately examine the potential impacts of manure applications on the e. coli levels of each stream. The ability of the MMP to prevent significant increases in e coli levels is assumed, but nowhere critically analyzed. This needs far greater scrutiny, especially given the substantial increases in application amounts in some sub watersheds.

The EAW erroneously equates liquid manure for the operation with nitrogen fertilizer. Manure contains has other chemicals and bacteria, yet the EAW largely ignores their impacts.

The EAW fails to break out how much manure will be applied in each sub watershed. Based upon the current number of AUs in the Rush Creek (1,783 AU), which does not include any animals from Daley’s existing operations, it seems likely that the manure applied by the expanded operation in the Rush Creek sub watershed will exceed this amount. In other words the amount of manure spread on these sensitive soils with double. The likelihood of increased levels of pollutants and bacteria levels was not examined. It should be for this sub watershed, as well as the others.

The EAW also assumes that the state mandated buffer strips and setback strips by sinkholes will be followed and are actually adequate to remove pollutants. Yet there is much research collected by BWSR and other state agencies that indicates the 50 foot buffer strips do not remove all pollutants. This area needs further study, as does the cumulative impacts of manure applications around this many sinkholes and streams in a small area.

The proposed project is likely to have significant environmental effects, especially on the quality of aquifers and surface waters, as well as the trout and other aquatic organism which populate the trout streams in the area. For this reason we respectfully request that the MPCA order an EIS be prepared for this project.
Respectfully submitted,

John P. Lenczewski
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. After reading the EAW and seeing the proposed expansion of 3,000 cows I am concerned about the potential impact on the water resources of the sub-watersheds where the expansion project is located. The geology of the area and vulnerable groundwater resource needs to be better considered in an EIS. One map included shows a sinkhole at the edge of the LLP boundary. There are multiple karst formations and special consideration areas in manure application fields.

I have many concerns, including that fact that small family dairy operations are already suffering from oversupply of milk and reduced prices and this megafarm will make those economics much worse. The risks being taken on are not reasonable given the oversupply already. This economic concern that is not addressed in the EAW is in addition to the failure to adequately address the potential water pollution impacts.

A few of many environmental concerns are listed below:
- The probability of groundwater pollution in this sensitive porous limestone area is great - The consequence of further groundwater pollution added to the fact that many nearby towns already have elevated nitrate levels (i.e., close to meeting or exceeding allowable nitrate limits of 10 ppm), putting at risk the population including pregnant women and children -The health consequence are potentially very large -The concentration of the enormous volume of manure is setting up the likelihood for a massive pollution event from either "routine" leakage or a breach.
- The EAW does not address how the lagoon will withstand extreme weather events that are now a matter of time with our altered MN climate.
- Given that Daley will drill 2 new wells and increase water draw from ~32MG annually to 92MG annually. This is not a small increase, but a considerable one. The current EAW shows Daley has a permit to build the wells, but does not have a DNR permit to pump - more information on impact on hydrology of the area is warranted justifying an EIS -It is not clear that the total manure pit and feedpad runoff basin storage is adequate for the extreme weather events that have already occurred in MN with climate change and ones anticipated to be much more frequent and with larger volumes of rain in shorter periods. For example, the EAW listed management of feedpad runoff to accommodate a 25-year 24-hour storm event of 5.4 inches has been exceeded in MN this year. More realistic estimates of extreme weather events that will have consequences to manure pit and runoff basin storage capacities, and the potential for overflows and their consequences needs to be better addressed in an EIS.
- The manure pit storage volume of 281 days estimated by Daley seems marginal given the large amount of manure being generated, the sensitive geologic area, and the chance for extreme weather events that can increase the volume of waste in the pit and runoff basins and decrease the access to fields for spreading manure at critical times when pits and retention basins may overflow.
- Daley's Manure management does not anticipate any change in stormwater runoff characteristics (physically and chemically) from the Project manure application sites. Again consideration of increase in number and intensity of extreme weather events is missing and needs to be addressed in an EIS.

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult to trust that
the MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance. This is of great concern.

Sincerely,

Pat Schmieder
7100 Mikkonen Rd
Two Harbors, MN 55616-8060
Dear Ms. Grosenheider,

I am writing to comment on the EAW for the Daley Farms proposal and to request that MPCA require an EIS on the project, as state law clearly requires in this case. It is entirely obvious that this factory farm has the potential for significant environmental impacts, and therefore an EIS must be carried out. Failing to order the EIS would be not only an insult to Winona County residents, but a violation of state statute, and yet another tragic example of our government failing to protect the best interests of rural people. Is this the legacy the Dayton administration wants to leave? Is this how the Walz administration wants to begin its time in office?

I am a Winona County resident who works in Lewiston. I grew up on my family's farm only a few miles from the Daley operation. It is ALREADY a hazard to the community and far larger than is safe, appropriate, or necessary for any farm to be, particularly in this vulnerable region. I am extremely concerned about the potential harm this proposed expansion would cause to my family and to the entire Lewiston area and Winona County community. I am particularly concerned about the harm to our water. The Daley factory farm would use 92 million gallons of groundwater per year, an outrageous amount that is nearly 3 times the amount used by the entire town of Lewiston annually. The Daleys do not have more right to use water than anyone else in the community. The proposal would also generate 46 million gallons of liquid manure and wastewater per year, to be stored in open pits directly above vulnerable karst topography. I do not want to see my family members' or our neighbors' wells (including the Lewiston municipal wells) dry up or become contaminated with manure due to the Daleys' proposed abuse of public resources for private profit. The purpose of Minnesota's environmental review process is to identify and prevent such outcomes before they can occur.

Like all factory farms, this proposal is also a threat to air quality for rural neighbors. Odors generated by this operation are already a problem. Manure produced and concentrated at this scale generates literally poisonous gases, even beyond the foul odors that also cause unacceptable harm to rural people's quality of life.

Winona County itself has already recognized that an operation of this scale carries an unacceptable risk to the environment and people's health, safety, and quality of life. The Daley operation at its current scale is already above Winona County's animal unit cap of 1,500.

MPCA must not allow itself to be swayed by the Daleys' use of rhetoric to the effect that they are a "family farm" or that their proposal would somehow be of benefit to the community. It would bring no benefit to anyone but its owners, only harm and perhaps disaster. The Daleys' unwillingness to undergo an EIS has no bearing on whether or not one must be ordered: state law is clear. The role of our government is to protect the common good, for people and the land.

Thank you,
Johanna Rupprecht
460 E Mark St
Winona, MN 55987
320-305-4096
johanna.rupprecht@gmail.com
I strongly encourage implementation of a complete environmental impact statement on the large Winona country dairy proposal. My position is entirely in line with that advanced by the Land Stewardship Project.

I emphasize the social impact considering the impact of large dairies in my region, west central Minnesota. There is a need to study and consider the community breakdown that results from over-large farms. This impact statement might provide a start in that direction.

Dennis Johnson, retired U of M dairy scientist.
21474 430th Ave, Morris, MN 56267

320 760 4431, dairydgj@gmail.com
Attached and below are our comments:

Dear Ms. Grosenheider:

These are comments from the Land Stewardship Project to the Environmental Assessment Worksheet on the proposed Daley Farms of Lewiston, LLP – 2018 Dairy Expansion from 1,728 cows or 2,275 animal units to 4,628 cows or 5,968 animal units in section 16 of Utica Township, Winona County.

The project has the potential for significant environmental impacts and an Environmental Impact Statement (EIS) is required. Among others, this proposed dairy expansion contains the following potential significant negative environmental impacts:

1. **A failure of the manure pit due to the area’s karst geology is possible and must be analyzed through an EIS.** The EAW does not acknowledge or analyze the potential for the pit failure. This possible pit failure due to the sensitive karst area would result in millions of gallons of raw manure and liquid waste entering the groundwater. The EAW states this factory farm will generate 46 million gallons of manure and liquid waste annually and the pits will be emptied twice a year. This means there will be millions of gallons in the pit most of the year. Three of southeast Minnesota’s 22 municipal sewage lagoons have collapsed, the most recent in 1992. (Altura in 1976, Lewiston in 1991 and BelleChester in 1992). The MPCA must analyze what the impact of a catastrophic failure of this multi-million-gallon manure pit would be. After expansion, in total all manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed new 400' X 400' X 16' manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be and that requires an EIS.

   In a December 22, 2000 ruling on Fillmore County Residents Concerned for Health vs MPCA, District Court Judge Benson writes, “The MPCA’s decision not to conduct an EIS in this matter is not supported by the record and is arbitrary and capricious. The Court finds that the MPCA failed to consider at least one important aspect of the problem, i.e. the possibility of an underground collapse of the basin. If the basin would collapse how would ground water contamination be stopped? This Court could not find any information in the MPCA’s brief to answer this disturbing question. The MPCA should have addressed this issue and they did not.” (Ruling attached.) Much of the analysis in this ruling applies directly to this proposed dairy expansion. The EAW does not indicate that the pit is constructed to withstand the opening of one or several sinkholes beneath it.

2. **The impact on groundwater availability could be significantly, negatively impacted and must be analyzed through an EIS.** This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands."
If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

3. The impact on groundwater quality has the potential to be significantly, negatively impacted. The EAW indicates that groundwater is present at average depths of only 16 and 20 feet in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater. Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone according to the Minnesota Department of Natural Resources (DNR), there have been three mega-storms with rainfall totals over 9 inches during 24 to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation. (Source attached and available online here: [https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html](https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).)

Water wells in the nearby city of Utica and Lewiston are already compromised with nitrate and radium levels nearing, matching, and/or above the maximum level of 10mg/L designated by the Minnesota Department of Health. (Study attached and available here: [http://www.mda.state.mn.us/sites/default/files/inline-files/allctyresults_0.pdf](http://www.mda.state.mn.us/sites/default/files/inline-files/allctyresults_0.pdf)) Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.5% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates." (Study attached and available here: [www.mda.state.mn.us/townshiptesting](http://www.mda.state.mn.us/townshiptesting).) USDA Natural Resources Conservation Service studies indicate that 200 cows produce as much nitrogen as 5,000 people. (Source attached and available: [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).)

From the Minnesota Department of Health web site, “...where sources of nitrate such as fertilizers, animal wastes, or human sewage are concentrated near the ground surface, nitrate may seep down and contaminate the groundwater. Elevated nitrate levels in groundwater are often caused by run-off from barnyards or feedlots, excessive use of fertilizers, or septic systems….Nitrate contamination of a well is often regarded as a first sign of deteriorating groundwater quality.” (Attached and available here: [http://www.health.state.mn.us/divs/eh/wells/waterquality/nitrate.html](http://www.health.state.mn.us/divs/eh/wells/waterquality/nitrate.html).)

When nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water. The EAW indicates that groundwater is present at average depths of between just 16 and 20 feet in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater. Therefore, the law requires an EIS on Daley Farms proposal.

4. Daley Farms facilities are currently out of compliance with their NPDES permit. Although the MPCA acknowledges that Daley Farms manure pits and feed pads are out-of-compliance, they’ve been allowed to continue operating for about for many years without fixing the problem and coming into compliance. This flies in the face of a standard of “pollution discharge elimination”. It appears that during this period of non-compliance and non-enforcement, there has been no monitoring by MPCA of chemical and bacterial impact or any effort to measure the impact of leakage and runoff from out-of-compliance facilities on local water. In closing, we submit that “the potential for significant environmental impacts” is clear within the EAW for this project and therefore the law requires an EIS.

Sincerely,
Barbara Sogn-Frank
Land Stewardship Project
Factory Farm Policy Organizer
612-722-6377
bsognfrank@landstewardshipproject.org

Barb Sogn-Frank, Factory Farm Policy Organizer
Land Stewardship Project
bsognfrank@landstewardshipproject.org
507-479-9119 (cell)
612-722-6377 (office)
Kim Grosenheider  
Resource Management and Assistance Division  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, MN 55155

Nov. 15, 2018

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These are comments from the Land Stewardship Project to the Environmental Assessment Worksheet on the proposed Daley Farms of Lewiston, LLP – 2018 Dairy Expansion from 1,728 cows or 2,275 animal units to 4,628 cows or 5,968 animal units in section 16 of Utica Township, Winona County.

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3. **The impact on groundwater quality has the potential to be significantly, negatively impacted.** The EAW indicates that groundwater is present at average depths of only 16 and 20 feet in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater. Climate change has increased intense rainfall events—since 2004 in southern Minnesota alone according to the Minnesota Department of Natural Resources (DNR), there have been three mega-storms with rainfall totals over 9 inches during 24 to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation. (Source attached and available online here: [https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html](https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).)

Water wells in the nearby city of Utica and Lewiston are already compromised with nitrate and radium levels nearing, matching, and/or above the maximum level of 10mg/L designated by the Minnesota Department of Health. (Study attached and available here: [http://www.mda.state.mn.us/sites/default/files/inline-files/allcyrresults_0.pdf](http://www.mda.state.mn.us/sites/default/files/inline-files/allcyrresults_0.pdf)) Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.5% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates.” (Study attached and available here: [www.mda.state.mn.us/township testing](http://www.mda.state.mn.us/township testing).) USDA Natural Resources Conservation Service studies indicate that 200 cows produce as much nitrogen as 5,000 people. (Source attached and available: [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211))

From the Minnesota Department of Health web site, “...where sources of nitrate such as fertilizers, animal wastes, or human sewage are concentrated near the ground surface, nitrate may seep down and contaminate the groundwater. Elevated nitrate levels in groundwater are often caused by run-off from barnyards or feedlots, excessive use of fertilizers, or septic systems...Nitrate contamination of a well is often regarded as a first sign of deteriorating groundwater quality.” (Attached and available here: [http://www.health.state.mn.us/divs/eh/wells/waterquality/nitrate.html](http://www.health.state.mn.us/divs/eh/wells/waterquality/nitrate.html).)
When nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water. The EAW indicates that groundwater is present at average depths of between just 16 and 20 feet in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater. Therefore, the law requires an EIS on Daley Farms proposal.

4. Daley Farms facilities are currently out of compliance with their NPDES permit.
Although the MPCA acknowledges that Daley Farms manure pits and feed pads are out-of-compliance, they’ve been allowed to continue operating for about for many years without fixing the problem and coming into compliance. This flies in the face of a standard of “pollution discharge elimination”. It appears that during this period of non-compliance and non-enforcement, there has been no monitoring by MPCA of chemical and bacterial impact or any effort to measure the impact of leakage and runoff from out-of-compliance facilities on local water.

In closing, we submit that “the potential for significant environmental impacts” is clear within the EAW for this project and therefore the law requires an EIS.

Sincerely,

[Signature]

Barbara Sogn-Frank
Land Stewardship Project
Factory Farm Policy Organizer
612-722-6377
bsognfrank@landstewardshipproject.org
STATE OF MINNESOTA

STATE OF MINNESOTA IN DISTRICT COURT

COUNTY OF FILLMORE THIRD JUDICIAL DISTRICT

File No. CX-00-306

Fillmore County Residents
Concerned For Health, Janice Poldervaard,
Loren Poldervaard, Erwin Tart, Robert
Wood, Eloda Wood, George Heidtke,
Thomas Schulz, Larry Schulz, Otto Meyer,
Judy Tart, David Applen, Donovan Ruesink,
Jeff Tart, Joyce Tart, Sandy Oeljien, Mark Oeljien,
Karen Angell, Arlen Angell, Laurie Applen, Gene
Merkel, Darlene Merkel, Lois VanderPlas,
Verlyn Johnson, Sara Poldervaard, Robert K.
Johnson, Judy Bly-Smith,

Plaintiffs,

vs.

ORDER AND
MEMORANDUM OF LAW

Minnesota Pollution Control Agency,

Defendant,

Reiland Farms,

Intervenor.

This matter came on for hearing before the Honorable Robert R. Benson on September 25, 2000, on cross-motions for summary judgment.

James P. Peters and Karna M. Peters of Peters and Peters, PLC, 20020 S. Lakeshore Dr., Glenwood, Minnesota 56334, appeared on behalf of the Plaintiffs.

Ann E. Cohen, Assistant Attorney General, 445 Minnesota Street, Suite 900, St. Paul, Minnesota 55101-2127, appeared on behalf of Defendant Minnesota Pollution Control Agency (MPCA).

Michael S. Dove, 2700 South Broadway, P.O. Box 458, New Ulm, Minnesota 56073-3111, appeared on behalf of Defendant-Intervenor Reiland Farms.

This Court, being fully advised, and based on the files, records, and proceedings herein hereby finds and orders as
follows:

1. Plaintiff Fillmore County Residents Concerned for Health's motion for summary judgment is granted;
2. Defendant Minnesota Pollution Control Agency's motion for summary judgment is denied;
3. The attached Memorandum is incorporated by reference.

LET JUDGMENT BE ENTERED ACCORDINGLY.

BY THE COURT

Dated: December 22, 2000 /s/ Robert R. Benson

Robert R. Benson
Judge of District Court

JUDGMENT

The foregoing Order and Memorandum of Law dated the 22nd day of December, 2000 constitutes the Judgment of the Court.

Judgment is hereby entered this 22nd day of December, 2000.

JAMES ATTWOOD
COURT ADMINISTRATOR

http://www.courts.state.mn.us/districts/third/mpca.htm 1/2/01
MEMORANDUM OF LAW

Introduction

This Court, like most courts, is concerned about inserting the power of our third branch of government into areas that are primarily and appropriately within the realm of the legislative or executive branches. In the instant case, a statute was propounded by the legislature, but the enforcement and interpretation of that law was delegated by the legislature to the executive branch. Defendant MPCA argues that Plaintiffs seek to have this Court second-guess the technical judgment of the MPCA on the strength of popular opinion. "Boiled down" (to borrow another phrase from Defendant's brief) Defendant essentially argues that this issue is none of the Court's business. This Court wishes it were so. However, the same legislature that delegated responsibility to the MPCA also specifies by law (Minn. Stat. §116D.04 subd. 10) that an executive decision on the need for an EIS is reviewable in the District Court. Plaintiffs have properly sought the review of this Court.

Fillmore County Residents Concerned for Health has filed a motion for summary judgment, which challenges MPCA's negative declaration concerning the need for an environmental impact statement (EIS) regarding Reiland Farms' proposal to develop a dairy feedlot in the karst area of southeastern Minnesota. Defendant MPCA has filed a cross motion for summary judgment. The Court finds that the Plaintiffs are entitled to summary judgment. The motion of Defendants for summary judgment is denied.

There has also been disagreement over the Plaintiff's offer of proof to the Court. The Court finds that some of these items will be allowed into evidence as stated below in greater detail.

Plaintiff's Offer of Proof

The Court may consider evidence outside the administrative record when 1) the agency's failure to explain its action frustrates judicial review; 2) additional evidence is necessary to explain technical terms of complex subject matter involved in the agency action; 3) the agency failed to consider information relevant to making its decision; or 4) plaintiffs make a showing that the agency acted in bad faith. White v. Minnesota Department of Natural Resources, 567 N.W.2d 724, 735 (Minn. App. 1997). If the evidence submitted outside the administrative record demonstrates that the agency's effort was clearly inadequate or that the agency failed to set forth widely shared relevant scientific views, the Court's proper function is to remand to the agency for correction of the agency's error. Id.

It should be noted that the Court is only addressing the offers of proof which are being admitted and which were initially contested in this decision.

Peters Exhibit C:

This exhibit shall not be admitted. Exhibit C is unclear in its comments, and there are sufficient viewpoints from Dr. E. Calvin Alexander, Jr. present in the official record.

Peters Exhibit I:

The Guidelines for Alternative EAW form for Animal Feedlots provide general guidance on the EAW form and explains how the MPCA interprets the technical terms of "phased actions" established by EQB (Environmental Quality Board) rules. Under White and Audubon (National Audubon Society v. Minnesota Pollution Control Agency, 569 N.W.2d 211 (Minn. App. 1997)), the information is relevant to explain technical terms and is therefore admitted for this purpose.

Peters Exhibit J:

This exhibit is admitted because it is not objected to by the MPCA.
Peters Exhibit N:

This exhibit shall not be admitted. It does appear to the Court that this document, which is essentially a memo from one person in the Department of Health to another person in the Department of Health, is strictly an internal memorandum, and accordingly its admission would appear to the Court to be in violation of Audubon.

Peters Exhibit O:

This exhibit has been withdrawn by the plaintiff and shall not be considered.

Peters Exhibit S:

This exhibit is withdrawn by plaintiff and shall not be considered.

Peters Exhibit W:

The MPCA does not object to this document and it shall be considered.

Peters Exhibit CC:

The Court finds that this exhibit should not be admitted. It appears to be cumulative and it does not constitute such additional evidence that would meet the White criteria.

Peters Exhibit DD:

This exhibit does discuss a report of the MPCA (the RGU (Responsible Government Unit)) and it would appear to the Court that the data in this report is something that should have been considered by the MPCA. Clearly it does discuss the information which was in the hands of the MPCA and which it should have considered. This Court finds that this information is admissible under Audubon.

Peters Exhibit EE:

This exhibit demonstrates the scientific view that manure application can cause serious bacteria contamination of groundwater, thereby meeting the standard for consideration of the evidence. It is clear, however, that the document was available to the MPCA during its deliberations. The MPCA should recognize its own studies, and it is not necessary for plaintiff in this case to submit into the administrative record information generated by the MPCA. Accordingly the Court admits this exhibit.

Peters Exhibit FF:

The Court finds that this exhibit is appropriate to include. It contains detailed information on MPCA staff reasoning on a project that is similar even though not the same as the currently proposed project. In many ways, the Court agrees that it is not the same as the proposed project but there are parts of it that contain MPCA staff reasoning. The staff reasoning in some cases relates to the types of problems that are foreseen in the current project. Therefore, the Court finds that this exhibit does meet the White criteria. The Court understands that in the above case the MPCA board did not recommend an EIS, but some of the MPCA staff certainly did.
Peters Exhibit HH:

The MPCA does not object to this document and so it shall be admitted.

Peters Exhibit II:

The MPCA does not object to this document and so it shall be admitted.

Peters Exhibit JJ:

The Court finds that this exhibit does not meet any of the White criteria and is not otherwise helpful to the Court and it therefore shall not be admitted.

Peters Exhibit KK:

The notes shown in this exhibit are not explained to the Court in any manner. These notes are also undated and do not meet any of the criteria listed in White. This Court cannot determine how these notes would be helpful to it and therefore denies admission.

Tart, Poldervaard and Heidtke affidavits and pictures:

Essentially these affidavits and pictures deal with water problems alleged in the general area where the project is to be located, but not where the lagoon would actually be located. These documents do not meet any of the criteria set forth in White. This Court finds that this information is cumulative and shall not be admitted.

Facts

The parties have essentially agreed upon the facts. The Court finds the pertinent facts to be as follows:

This project is proposed to occur in the karst regions of Southeastern Minnesota. Karst is a geological term for a landscape area created over soluble rock with efficient drainage. Constructing New Manure Storage Systems in the Karst Region, Interim Guidelines Document, pg. 2 (March 2000). The underlying carbonate bedrock in a karst region dissolves over time to produce solution-enlarged joints and cracks. Id. These features can result in rapid transmission of contaminants from the land surface to the groundwater below. Id. Groundwater contamination from excessive levels of nitrates and bacteria, which exceed state health standards, is already higher in Fillmore County than in other counties in the area.

Reiland Farms is a third-generation family farm. In an effort to compete in an ever-changing agricultural arena Reiland Farms proposed to develop a dairy feedlot near their home in Fillmore County. Reiland Farms agreed to voluntarily prepare an Environmental Assessment Worksheet (EAW) to ensure the environmental integrity of its proposed dairy.

The Feedlot expands upon and aggregates with an existing feedlot at their Home site, which is permitted for 390 animal units. According to the EAW, the Feedlot proposes to use the Home site to feed replacement heifers for the new facility and may expand. The Home site sits in an area of high risk for sinkhole formation. The EAW also affirmatively states in a check-off box that the Feedlot includes a planned and likely expansion of 560 animal units.

The Feedlot includes plans for two open manure basins holding a total of 7.3 million gallons of liquid manure with capacity to serve 1,260 animal units. The Feedlot is proposed for the karst region with nearby blind valleys and sinkholes.
The Feedlot is proposed near the North Branch of the Forestville Creek, a high quality trout stream, near the South Branch Root River, near groundwater resources in the area and near a state park.

In February 2000, the MPCA published an EAW that summarized environmental information relative to Reiland Farms' proposal to develop a Feedlot. After review of geological and engineering information regarding the proposed facility, the MPCA concluded that location and design of the facility were adequately protective of the environment and that the Reilands would not be required to prepare an EIS.

Analysis

THE MPCA'S NEGATIVE DECISION INVOLVING AN EIS

This Court has jurisdiction over this matter under Minn. Stat. §116D.04, subd. 10, which provides that decisions on the need for an EIS may be reviewed in the District Court of the County where the action is proposed to be taken.

Summary judgment shall be rendered if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that either party is entitled to judgment as a matter of law. Minn. R.Civ.P. 56.03. In ruling on a summary judgment motion, the Court must view the facts in the light most favorable to the non-moving party, and resolve doubts and factual inferences against the moving party. Hopkins v. Empire Fire & Marine Ins., 474 N.W.2d 209, 212 (Minn. App. 1991). The trial court's obligation is to determine whether issues of fact exist, not to weigh the evidence, determine credibility of the witnesses or resolve the issues of fact. Schumacher v. Heig, 454 N.W.2d 446, 448 (Minn. App. 1990); Nord v. Herreid, 305 N.W.2d 337 (Minn. 1981).

When reviewing a responsible government agency's negative declaration of need for an EIS, this Court reviews the decision to determine if it is "unreasonable, arbitrary or capricious, with review focused on the legal sufficiency of and factual basis for the reasons given." Iron Rangers for Responsible Ridge Action v. Iron Range Resources, 531 N.W.2d 874, 880 (Minn. App. 1995) (quoting Swanson v. City of Bloomington, 421 N.W.2d 307, 303 (Minn. 1988)). An agency's decision is arbitrary and capricious if it does not represent its will and not its judgment. Trout Unlimited, Inc. v. Minnesota Dep't of Agriculture, 528 N.W.2d 903, 907 (Minn. App. 1995).

An agency ruling is arbitrary and capricious if the agency: 1) relies on factors not intended by the legislature; 2) entirely failed to consider an important aspect of the problem; 3) offered an explanation that runs counter to the evidence; or 4) the decision is so implausible that it could not be explained as a difference in view or the result of the agency's expertise.

White at 730.

Agency decisions are reversed only when they reflect an error of law, the findings are arbitrary or capricious, or the findings are unsupported by substantial evidence. Id. The Courts have endorsed the following definition of "substantial evidence": 1) such relevant evidence as a reasonable mind might accept as adequate to support a conclusion; 2) more than a scintilla of evidence; 3) more than some evidence; 4) more than any evidence; 5) evidence considered in its entirety. Id. The Court will intervene, however, where there is combination of danger signals which suggest the agency has not taken a hard look at the salient problems and the decision lacks articulated standards and reflective findings. Id.

An EIS is required where there is potential for significant environmental effects. Audubon at 216. In determining whether a project has the potential for significant environmental effects, the agency must consider four factors: 1) type, extent, and reversibility of environmental effects; 2) cumulative potential effects of related or anticipated future projects; 3) the extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority; and 4) the extent to which the environmental effects can be anticipated and controlled as a result of other environmental studies undertaken by public agencies or the project proposer, or of EIS's previously prepared on similar projects. Id. and Rule 4410.1700 Subp. 7 Minnesota Rules (1999). The Court will address each of the four factors in turn.

1. Type, extent, and reversibility of environmental effects

The Plaintiffs claim that the MPCA's Findings: (1) do not address the substantive comments in violation of Minn. R. 4410.1700, subp. 4; (2) contain conclusions that are contrary to the comments and the evidence in the record; (3) fail to consider MPCA's studies that show groundwater contamination from intensive agriculture; and (4) fail to consider the incremental impacts from this operation upon the already existing contamination of ground and

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surface water.

The Plaintiffs state that there is a wealth of evidence in the record that suggests a significant potential for groundwater contamination at this particular proposed feedlot site. They also claim that during the spring melting periods and during heavy rainfall, wide channels of water run off the land around the Feedlot. The MPCA has acknowledged the close proximity of the groundwater to the surface by requiring that the land around the basins must undergo a dewatering procedure to artificially bring down the water table. The Plaintiffs also point out the concern about contaminated groundwater and claim that the MPCA did not address these concerns, making their decision arbitrary.

One of the most significant environmental impacts posed by the planned facility, according to the Plaintiffs, is the catastrophic level of water pollution that would result from a sinkhole developing under the manure storage basin and breaching the structure. If such an event were to occur, 7.3 million gallon of liquid waste could flow into groundwater through the sinkhole breach. Plaintiffs also argue that because of the close connection between groundwater flows and surface water flows in this area, it is also highly likely that liquid waste flowing into the groundwater due to a sinkhole breach would quickly reach the surface water such as Forestville Creek, one of the premier trout streams in the state, and eventually flow through Forestville State Park and nearby campground where thousands of visitors will come into direct contact with the manure-polluted water through swimming and fishing activities.

Various individuals, especially those who live closest to the proposed feedlot, commented with concerns about air emissions and odors. The Plaintiffs claim that the MPCA made no findings on air emissions and odor and allowed the project to go forward without an EIS even where the preliminary modeling predicted air emissions would exceed allowable levels. They claim that the belated permit conditions to reduce or eliminate the potential failures in air quality demonstrate MPCA's concern for air emissions and constitute an abandonment of MPCA's duty to determine the potential for significant effects before they occur.

The MPCA reviewed an air emissions modeling study of the facility performed by Gantzer Environmental Software and Services, Inc. The MPCA concluded that the facility could comply with ambient standards and Health Risk Values, and that it would not cause nuisance odor that could be detected by receptors beyond the property line, although some odorous emissions could be detected at the property line. Also based on their investigations the MPCA concluded that cumulative impacts should not be significant. When dealing with air emissions this Court finds that the MPCA's findings were based on some evidence, as discussed above.

The MPCA reviewed a manure management plan submitted by the Reilands. Based on the analysis in this plan, the MPCA concluded that the manure spreading would not result in additional loading of either phosphorus or nitrates. The MPCA found no information that would support the conclusion that manure has harsher environmental impacts than chemical fertilizers. When dealing with manure management the Court finds that the MPCA's findings were based on some evidence, as discussed above.

The MPCA states that three prongs support its conclusion that the proposed facility would not cause significant environmental impacts as the result of karst-related failure. First, the MPCA evaluated the geological evidence regarding the proposed site. This information, it claims, suggested that the land proposed for the facility "has relatively little evidence of soil collapse problems..." even though in a moderate to high-risk area. The MPCA also considered the engineering of the proposed facility, its liner system, and depth to bedrock, claiming that this information suggested that the proposed facility would not accelerate sinkhole formation.

The MPCA claims that they followed the guidelines put in place for minimum separation distances in the karst area. They state that two factors are considered: the number of animal units to be handled at the facility and the type of storage system (liner). For facilities between 300 to 999 animal units with a composite liner, the guidance proposes that there be five feet separation between the liquid manure and the bedrock. The MPCA did find the minimum of 5 feet separation required for a facility consisting of 300 to 999 animal units.

The record shows that the MPCA did research the area of environmental effects, however, this Court finds that not all major issues were discussed by this agency. The agency neglected to talk about the possibility of the storage basin being breached underground. There were discussions about a spill above ground and what could be done in this situation, but none about underground spills. The Court agrees that there was information stating that there would be limited seepage, but that does not resolve the issue of mitigation of a spill larger than limited seepage.
There should be a plan put into effect to encompass the problem of a spill underground. How would this be contained? How would the groundwater be protected? How would Forestville State Park and the trout streams be protected? This Court is concerned because these areas were not addressed and they should have been. The Plaintiffs were correct in questioning the possible contamination of the groundwater and the trout streams located in the area.

A reviewing Court will intervene only where there is a "combination of danger signals (that) suggest the agency has not taken a 'hard look' at the salient problems and "has not genuinely engaged in reasoned decision-making." Pope County Mothers v. Minnesota Pollution Control Agency, 594 N.W.2d 233, 236 (Minn. App. 1999). This Court finds that this is the situation in the case at hand. When asked about spills the Agency would respond by talking about above ground spills and by assuring people that there would not be an underground spill or only a little leakage because of the durability of composite liners, but this does not answer the question.

This Court finds that this is a very real issue and one that should have been addressed by the Agency before finding that an EIS was not in order in this case. The MPCA neglected its duties when it did not discuss the type, extent, and reversibility of the environmental effects of an underground spill. The MPCA did make a conscious effort to discuss other issues that caused concern, but completely avoided this issue. The MPCA's neglect in discussing this issue shows that their decision was arbitrary and capricious.

Essentially this Court finds that the MPCA considered all the concerns except how to mitigate the problem of an underground spill from the pond. If a collapse occurs, how would the pollution be mitigated? There is no discussion of this and thus the MPCA did not fulfill its requirement. On all the other issues discussed, the MPCA made a decision based on some evidence. The Court might disagree with the decision, but it is bound to honor that decision.

One of the problems also not discussed is the problem of water (from the higher water table or from precipitation) migrating downward along the outside of the liner. After reviewing studies contained in the record, it appears such water would likely travel along the liner to the bottom of the lined lagoon. Would this then carry the risk of accelerated failure of the ground under the lagoon? Is this risk greater if less than 10 feet of soil is not present between the bedrock and the liner above it?

2. Cumulative potential effects of related or anticipated future projects.

The EQB rules provide that "multiple projects and multiple stages of a single project that are connected actions or phased actions must be considered in total when...preparing the EAW, and determining the need for an EIS." Minn. R. 4410.1000, subp. 4. The EQB rules define "phased action" as meaning "two or more projects to be undertaken by the same proposer that a RGU determines: (1) will have environmental effects on the same geographic area; and (2) are substantially certain to be undertaken sequentially over a limited period of time." Minn. R. 4410.0200, subp. 60.

The Plaintiffs state they have submitted evidence that the expansion is substantially certain to occur in a limited period of time, including: 1) MPCA's own certified admission at pages 4 and 19 of the EAW; 2) the Project site map showing the exact location of the future freestall barn on Exhibit 3a, page 1 to the EAW; and 3) the May 23, 2000 Findings of MPCA verifying that the manure settling basin and the manure storage basin are designed for manure from 1,000 mature dairy cows (1,400 animal units).

The MPCA states that the definition of "phased action" in the EQB rules ensures that environmental review is not undertaken on expansions of projects that are speculative. The MPCA argues that although the EAW notes that the Reilands have designed their new dairy facility to accommodate future expansion, the MPCA would have been on solid ground had it decided not to include any information in the EAW regarding the impacts from the expansion because it was not "substantially certain" to occur in a "limited period of time."

The Court disagrees with the MPCA. This Court finds that there is a strong possibility that there will be an expansion within a limited period of time. The new freestall barn will encompass the same land as what is in dispute in this action. The Court also finds that this barn will be constructed in a limited period of time. Although there is no guidance on what "limited period of time" means, this Court finds that it is relatively certain that a barn will be constructed in the near future. This information is supported by the fact that the plans do have the freestall barn listed on them. This information is also supported by the fact that the storage basin is large enough to hold
manure for at least 1,000 animal units.

The law is explicit that large projects must not be broken up into smaller units in order to avoid environmental review. Pope County Mothers at 237. The rules governing environmental review recognize that cumulative impacts can result from individually minor but collectively significant projects taking place over a "period of time." Id.

The Court’s decision that this is actually a phased action will also impact the minimum separation distance that is mentioned under the first factor. To determine whether the minimum separation distance will be met, the owner must conduct soil thickness investigations at a minimum of four locations for the first one-half acre of manure storage area surface and a minimum of two additional locations for each additional acre. Constructing New Manure Storage Systems at 8. According to Table 1 of this article a minimum separation distance of 10 feet is needed when the basin is serving over 1000 animal units. Id. at 9.

The Court is also perplexed by the fact that the MPCA and the Reilands argue that they can store manure in these basins for up to a year, and very well may do so, but this would not force them to have 10 feet minimum separation. Would this not be the same volume and amount of weight that would be caused by having over 1,000 animal units and emptying the basin twice a year? At any rate, this Court finds that since the current project and the anticipated freestall barn shall be considered as a phased action this project would still need to have at least a minimum separation of 10 feet between the bedrock to meet the MPCA’s own guidelines.

3. The Extent to Which the Environmental Effects are Subject to Mitigation by Ongoing Public Regulatory Authority.

The extent to which environmental effects are subject to mitigation is an important consideration when determining whether a project has the potential for significant environmental effects. Pope County Mothers at 238. The MPCA must consider the extent of the environmental effects likely to result and how those effects could be mitigated. Id. Mitigation includes avoiding or limiting the size of a project, repairing or restoring the environment, working to preserve or maintain the environment during the life of the project, or replacing or substituting resources. Trout Unlimited at 907.

The Plaintiffs state that the MPCA is improperly deferring key issues to the permitting phase; one of them being whether this proposed operation poses a significant environmental impact. The Plaintiffs claim that the MPCA is relying on soil inspections during the construction of the manure storage basin to determine whether there is subsurface evidence that suggest a possibility of sinkhole development under the manure storage basin. They state that deferring the gathering of key information to the post-permitting stage is an abandonment of the agency’s duty in an EIS determination.

The Plaintiffs are concerned because the MPCA did not seek additional Ground Penetrating Radar tests in better conditions to obtain a thorough investigation of the subsurface conditions under the manure basin before allowing the project to proceed. They state such soil investigation during construction will not provide the kind of subsurface investigation that Dr. Alexander and the DNR insist are necessary. Dr. Alexander stated that the additional investigation was easy to redo and the DNR stated that additional information was necessary and could be obtained reasonably. The Plaintiffs state that the MPCA’s negative decision was premature and based on inadequate information.

The MPCA states that the case at hand does not have the same problems as Trout Unlimited and their decision should be upheld. In Trout Unlimited, the Court struck down the Department of Agriculture’s decision to identify significant impacts associated with pesticide and fertilizer application by monitoring after permits for the use of those chemicals were issued, instead of examining whether such impacts had the potential to be significant during the environmental review process. The Court found that the purpose of environmental review was to ensure that risks were identified before they occur, and that unspecified "monitoring and permit conditions" required after the deleterious effects occurred would not suffice. Id. at 909.

The Defendant states that the Court did not hold, however, that it was improper to consider mitigation of risks by specified emission limits and operating requirements proposed for facility permits. The Defendant points out that the Court has in other cases specifically noted that consideration of such mitigation measures during environmental review is appropriate so long as they are "more than mere vague statements of good intentions." Iron Rangers at
881. The MPCA concludes that the problem in Trout Unlimited was that the Commissioner of Agriculture both failed to examine the environmental effects likely to result from the project and how any effects could be mitigated; thus, so long as the EAW sets forth specific mitigation measures to address specific environmental effect, such consideration is proper.

The very purpose of an EIS is to determine the potential for significant environmental effects before they occur. Trout Unlimited at 909. By deferring issues to later permitting and monitoring decisions, the Commissioner abandoned his duty to require an EIS where there exists a "potential for significant environmental effects." Id.

Both Plaintiff and Defendant have offered logical arguments to support their respective positions. After a thorough review of case law and the facts, the Court finds that the MPCA did not address the mitigating factors. As in Trout Unlimited, the project here would go forward without an EIS and in the event significant environmental effects did occur, the project may be cancelled. The MPCA is relying on permitting and monitoring just as the RGU did in Trout Unlimited. As stated above the MPCA does not even address certain issues, much less talk about how to mitigate them. It is the MPCA’s duty to determine the possible environmental effects; they have neglected this duty in the case at hand.

The Court also questions the fact that the basin is larger than the capacity needed at this time, which supports the finding that this project is a phased action. One of the factors to consider when looking at mitigation includes limiting the size of the project. It would make sense for the MPCA to have limited the size of the storage basin, given the sensitive karst region and the claim that there is not any immediate plan to expand. This reaffirms the Court’s finding that the MPCA did not fulfill its duty when dealing with the issue of mitigation.

4. The extent to which the environmental effects can be anticipated and controlled as a result of other environmental studies undertaken by public agencies or the project proposer, or of EIS’s previously prepared on similar projects

The Plaintiffs claim that the MPCA had relevant information and disregarded it. The MPCA has been studying nitrates in Minnesota groundwater beneath agricultural land for years. In March 1999, the MPCA identified groundwater impacts from land application of manure as one of three objectives for examination in a study entitled "Effects of Manure Management on Ground Water Quality." The MPCA was also provided a copy of the Iowa Department of Public Health’s article on the chemical and microbial constituents of ground and surface water proximal to large-scale swine operations. Plaintiffs claim that this study shows that pathogens in manure break down more slowly when incorporated in the ground. The Plaintiffs also state that the MPCA omitted the most pertinent studies in an arbitrary fashion.

The Interim Guidelines are established by the MPCA to define the measures and conditions generally needed to ensure that, to the maximum extent practicable, groundwater is protected when new liquid manure storage systems are constructed in the karst region. Constructing New Manure Storage Systems at 1. Minnesota Rule 7060.0500 states that it is the "policy of the Minnesota Pollution Control Agency to control wastes as may be necessary to ensure that to the maximum practicable extent the underground waters of the state are maintained at their natural quality." Id. Maintaining high quality ground water supplies is challenging in the karst region of southeastern Minnesota due to the rapid transport of contaminants from the land surface to ground water in this unique geologic setting. Id.

Three potential water quality risks associated with liquid manure storage systems in the karst region are described below. Two of the risk factors could lead to long-term (chronic) problems, whereas the third risk factor is associated with catastrophic failure. Id. at 3. The water quality risks include: 1) seepage of contaminants through the liner and underlying soil to fractured bedrock and subsequently to ground water; 2) gradual soil subsidence of formation of a shallow sinkhole below the storage structure that breaches the integrity of the liner, causing slow and perhaps indetectable leaking of manure from the storage system to ground water; and 3) larger sinkhole forming below a manure storage system leading to a rapid flow of manure into ground water or causing a collapse in a basin sidewall and a release of manure onto the ground surface. Id. at 3.

Manure entering ground water will discharge into streams within a period of time ranging from hours to decades depending on the site-specific hydrogeology. Id. The karst region of Minnesota maintains a large number of high quality trout streams. A rapid discharge of a large quantity of manure into a stream will destroy the aquatic life for a stretch of the stream and also result in increased nutrient loading into the receiving waters of the Mississippi River system. Id. Manure that travels in the ground water for a longer period before discharging into streams will be more diluted and may not destroy aquatic life, but will threaten drinking water supplies as it travels toward the stream, and then still contribute to
stream pollution upon discharge. Id.

Using liners with very low seepage rates can reduce the probability of a soil collapse below a manure storage system. Id. at 4. Risks of failure can also be reduced by such measures as proper siting of the storage facility on the landscape; minimizing the manure storage capacity; preventing excess infiltration of runoff water around the storage facility; and maintaining a certain separation distance between the manure and fractured bedrock. Id.

Between 1974 and 1992, sinkholes opened below three of the twenty-two municipal wastewater treatment ponds in Minnesota’s karst region. Id. at 4. These failures demonstrate the potential for sinkholes to develop in southeastern Minnesota when large quantities of liquids are stored in sinkhole prone areas with minimum barriers between the liquid and underlying materials. Id. It is important to consider that the contamination concentration of manure lagoons are often over 100 times greater than municipal wastewater pond liquids, and thus the environmental consequences of a catastrophic manure release could be much worse than municipal pond failures. Id.

Most sinkholes in southeastern Minnesota appear where there is less than 50 feet of soil cover over carbonate and sandstone bedrock. Id. at 5. The risk of soil collapse has generally been found to increase in areas of ponded or intermittently flowing water, and in areas with indication of more extensive karstification, including areas with disappearing streams, caves, springs and solution cavities. Id.

After reading the interim guidelines and reading over the briefs of counsel this Court finds that leaks and seepage can be anticipated. As a matter of fact, it seems to be the norm that these basins do have seepage. This Court finds that the MPCA did not take advantage of some of the data that was available to them. The Guidelines state that there is concern about protecting the groundwater, but there is not a plan to mitigate (or at least none was mentioned) if a sinkhole would form underneath the basin. As stated above, the MPCA does discuss an above ground spill and does have a plan if this were to occur, but nothing is mentioned about below ground spills. As the guidelines point out, the streams, as well as drinking water could be harmed if this were to occur.

As stated above, this Court does find that this is a phased action and therefore, the proposed freestall barn should be included in the evaluation of this site. Given this information and the MPCA’s own guidelines, there is not enough separation distance between liquid manure and fractured bedrock to erect these basins on the proposed site.

Conclusions

An RGU’s decision is arbitrary and capricious if it: (1) relied on factors the legislature never intended it to consider; (2) entirely failed to consider an important aspect of the problem; (3) offered an explanation for its decision that runs counter to the evidence; or (4) is so implausible that it could not be ascribed to a difference in view or the result of agency expertise. Pope County Mothers at 236. If the RGU’s decision represents its will rather than its judgment, that decision is arbitrary and capricious. Id.

The MPCA’s decision not to conduct an EIS in this matter is not supported by the record and is arbitrary and capricious. This Court finds that the MPCA failed to consider at least one important aspect of the problem, i.e., the possibility of an underground collapse of the basin. If the basin would collapse how would ground water contamination be stopped? This Court could not find any information in the MPCA’s brief to answer this disturbing question. The MPCA should have addressed this issue and they did not.

This Court also finds that the MPCA violated its own interim guidelines by only requiring five feet of separation distance when using a composite liner, instead of the 10 feet required for a facility designed for over 1,000 animal units. This Court, as stated earlier, finds that this is a phased action and therefore it should be held to the standards applied for a project comprised of over 1,000 animal units instead of the 300 to 999 animal units this study was based on.

Plaintiffs have argued that the MPCA decision was improperly influenced by the threats of members of the legislative branch to change the law. Writing and rewriting of the law is what legislatures do. It is not the function of the Court to determine what is or is not proper in discussions between the legislative and executive branches of our government. Furthermore, this Court suspects that the executive branch is fully capable of protecting itself from the legislative branch. This Court doubts that the executive branch needs judicial protection from the legislature.

Obviously this decision does not bar the completion of the proposed project. It does, however, require further evaluation
by the RGU. This Court is mindful that the preparation of an EIS is costly and time consuming, but then, so is litigation. Based on all the information in the file and the law, the Plaintiff's motion for summary judgment is granted, and Defendant's motion for summary judgment is denied.

This decision is not meant to, and should not be read as a denigration of the work and investigation completed by the MPCA on this issue. Most of the disputed issues have been resolved in favor of the MPCA. While the Court may not have reached the same conclusions as the MPCA, where these conclusions were based on some reasonable evidence this Court should not intervene. RRB
Gambling on the Karst?
By Mary Losure, Minnesota Public Radio
September 10, 2001

Much of the rolling, picturesque farmland of southeast Minnesota is what geologists call "karst." The soil is underlain by cracked, water-soluble rock, riddled with underground tunnels and caves. That makes the region's groundwater highly vulnerable to pollution. Depressions, known as sinkholes, can appear without warning when the underlying rock collapses. Sinkholes act like drains, whooshing water - and contaminants - into underground aquifers.

Now, many local residents are worried as large, industrial-scale feedlots begin to move into the karst region.

Bob and Eloda Wood are retired dairy farmers who do volunteer monitoring of the south branch of the Root River in southeast Minnesota. It's one of the state's best trout streams, and flows through Forestville State Park.

Each week, the two drive the winding road from their farm to the stream to collect samples. On a recent day, Eloda Wood pointed out the sinkholes, disappearing stream valleys, and other classic karst features along the way.

"They tell us that much of our surface is like Swiss cheese, and wherever there is vertical crack, that's an invitation for a sinkhole," she says.

So the Woods were alarmed when they learned of plans to build a factory-scale feedlot, the Reiland Dairy, just up the valley from Forestville State Park.

The dairy's earthen-lined manure lagoons would hold more than seven million gallons of manure. If a sinkhole opened up under a lagoon, the Woods and other opponents worry that all that manure would flow into the groundwater. From there it could gush through underground rock tunnels into the Root River and devastate both it and Forestville State Park.

"Instead of just flooding with water, it would be flooding with manure," Bob Wood says.

A University of Minnesota karst expert characterized the feedlot's risk as "enormous." Both the state Department of Natural Resources and the state Health Department expressed serious concerns, but the Minnesota Pollution Control Agency ruled the project could go ahead.

Opponents, including the Woods, took the PCA to court - and won. In December, a Fillmore County Judge ruled the agency had neglected its duty by failing to consider the catastrophic level of water pollution a sinkhole collapse might cause.

The judge noted that three of the areas 22 municipal sewage lagoons have collapsed, the most recent in 1992. And he pointed out that manure lagoons pose a much greater environmental threat than sewage lagoons, since they are often more than 100 times more concentrated.

But PCA officials still insist the project could have gone ahead safely. "That was our decision and is still our decision," according to Beth Lockwood, the supervisor of the agency's environmental review program. Lockwood says the agency evaluates only environmental impacts that may be "reasonably expected" to occur from a project, and in the agency's judgement, a sinkhole breach was too remote a possibility to consider.

"We did not feel that after the engineering was all designed, and we looked at the project as a whole and how it was designed and engineered, that we reasonably expected a catastrophic release to happen," according to Lockwood.

The PCA did not appeal the judge's decision, and proposers of the dairy decided to move it to another area. But it's likely more lagoons will be proposed in the karst region, as as dairy farmers there expand their operations. That could cause problems.

Manure lagoons have caused massive water contamination in North Carolina, the state where they were first widely used. They are now banned there.

Minnesota has banned them for hogs, but still allows them for dairies.

In Minnesota's karst geology, dairy manure lagoons are permitted as long as there are no more than four sinkholes within a 1,000 feet and the bedrock is more than 10 feet down. In addition, lagoons may not be built within 300 feet of any sinkhole. Hog manure pits must be lined with cement.

If they meet those regulations, the only thing stopping big feedlots in the karst is local opposition. And that isn't always as effective as it was in the Reiland case.

"We're right in the middle of three big outfits," laments Kermit Burt, whose parents own Burt's Hilltop Poultry, a small poultry processing plant surrounded by a large turkey farm and two industrial-scale hog operations.

Now the Burts worry about their well. "What's going to happen if our well does suddenly shoot sky high in nitrates and we've got to replace it? Who's going to cover it?"

The Burts and other neighbors fought hard against the most recently built hog feedlot. Until this summer, they thought they'd stopped it.

The feedlot was not large enough to require mandatory review by the PCA, but the county board had denied it a permit because it would sit in a high-risk karst area.

The Minnesota State Court of Appeals upheld the county's decision, ruling that "the proposed feedlot presents legitimate public health concerns."

But this June, neighbors like Dale Pierce learned it was going up anyway. "We thought that because it was all denied by the county officials and even the state Court of Appeals, that it would not go any further. But then they changed the way animal units are counted, and one person was able to approve the permit, and we've got the building now and we can't do a darn thing about it," says neighbor Dale Pierce.

A little-noticed change in the county's regulations had put the proposed feedlot just under the size limit for environmental review by the county.
Bobby King, an organizer for the family farm group The Land Stewardship Project in Lewiston, says with the weakened county regulations, there's not much they can do. "Now we're relying basically on the PCA to look out for a facility that size to make sure it's safe. And we know they're not doing the job," King says.

But others, like State Sen. Kenric Scheevel, R-Preston, say blanket opposition to big feedlots in karst terrain is misguided. The area has traditionally been home to small-scale livestock operations, and Scheevel says if such farmers can't expand, they'll get out of the livestock business. He says that would mean hilly terrain that's traditionally been used for pasture, would be plowed up and planted in row crops like corn and soybeans, which would greatly increase soil erosion.

"Frankly, a lot of those hills will end up in our waterways, because farmers are going to use their land; they're not going to just idle it. They're in the business of producing either crops or livestock," Scheevel says.

Scheevel says large feedlots can be built safely, as long as they're properly located. "There is a certain level of risk to anything you build in the karst region," he says, "but you can also map out the sinkhole plains, and you find that there are regions in which the sinkholes tend to follow a specific pattern. You get away from those sinkhole plains, and the risk of a sinkhole opening up is probably minimal, if not almost irrelevant."

But others are not convinced the risks are minimal, especially if more and more factory-style farms move into the karst region.

The State Health department has asked the PCA to develop guidelines for emergency response plans in the area to handle possible catastrophic spills.

RISKY TERRAIN
Karst geology underlies many of Minnesota’s existing dairy operations. As farms on the karst expand, more manure lagoons may be built on the region’s fragile geology.

(See map)

Dairy operations map courtesy of the Land Management Information Center, Minnesota Office of Strategic and Long Range Planning. Source: Minnesota Department of Agriculture) See map. To view this map, you will need the Adobe Acrobat Reader.
Historic Mega-Rain Events in Minnesota

Minnesota is no stranger to heavy rain events. The early surveyors mapping out the state witnessed such events.

The DNR climate office has assembled a list of so-called "Mega-rain" events that have occurred since statehood. These are events in which six inches of rain covers more than 1000 square miles and the core of the event topped eight inches. Rainfalls of of this magnitude and geographic extent have the potential to become catastrophic. Using newspaper accounts, diaries, and the historical climate record, 15 such events in Minnesota’s post-settlement history have been identified. However, our ability to detect these events has improved dramatically since the 1970s.

The number of daily rainfall observers in Minnesota exploded in the early 1970s, thanks to the foresight and ambitions of Dr. Don Baker, and then-State Climatologist Earl Kuehnast. Since that period, the state has benefited from an unusually dense network of observations (/climate/summaries_and_publications/appliedmain.html). This network has remained intact, plus or minus year-to-year changes, and has enabled climatologists to identify mega-rainfall events that undoubtedly would have been missed during periods of much sparser observations.

Thus, the State Climatology Office considers the "stable" period of record to stretch from 1973 through present. Any given year during that period has roughly the same chance of capturing (or missing) an actual mega-event. The years prior to 1973, however, are likely to have some number of missing events.

If we examine the period 1973-2016, Minnesota has seen eleven mega-rains, with a sharp uptick since 2000, despite a small decrease in observer numbers. Of these 11 events, two were in the 1970s, one was in the 1980s, none were in the 1990s, but four occurred in both the 2000s, and the 2010s (still underway). Thus, the 18 years from 2000-2017 have seen nearly three times as many mega-rains as the 27 years spanning 1973-99. Although it is difficult to assess the statistical significance of that rapid increase, we do know that these trends are consistent with the expectation that Minnesota and the Upper Midwest will receive more precipitation, and more precipitation from large events (http://nca2014.globalchange.gov/report/regions/midwest#graphic-17083), in response to increasing global temperatures and increased available moisture for passing storm systems.

Documented Mega-Rains in Minnesota

(There may be other events prior to 1973 that require further investigation such as September 11-15, 1903 (https://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/COEsto
- **August 6, 1866 Southern Minnesota**

  Also known as the *Wisel Flood*, this event killed 16 people, including 3 members of the Wisel family in Fillmore County. 10.30 inches of rain fell at the Sibley Indian Agency located in Sibley County. The story of the Wisel family in peril appeared in the Harmony/Mabel/Canton News Record Newspaper.

- **July 17-19 1867 Central Minnesota**

  Climatologists and historians believe this to be Minnesota's most extreme flash flood of the past 200 years. In his *Minnesota Weather Almanac*, Mark Seeley referred to this event as "Minnesota's Greatest Thunderstorm." Torrential rains pounded portions of west-central Minnesota relentlessly. Unfortunately, the rains escaped direct measurement, but astute observers of the time estimated from unobstructed upright barrels and other such containers, that 30-36 inches of rain fell in 36 hours. No official observation in Minnesota has come anywhere near those magnitudes. The few surviving details of the storm back up the claims, however, as the flooding that resulted was unimaginable and catastrophic. Most of what we do know about this event comes from a paper (https://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/n_pdf) that was read before the Minnesota Academy of Sciences on March 7, 1876. Climate Historian Tom St. Martin summarized (https://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/1_pdf) the event as well.

- **July 20-22, 1909 Northern Minnesota**

  Extensive flood event from Northwest Minnesota to the UP of Michigan (https://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/C_PDF. Highest one day rainfall total was 10.75 inches at Beaulieu in Mahnomen County (11.10 inches for the three day total.) This storm also did extensive damage in Duluth and killed two children in the city when they were swept out of their mother's arms.

- **September 9-10 1947, Iron Range**

  24 hour totals of 6 inches or more at Hibbing, Ely and Winton. Unofficial report of 8.60 inches in five hours at Hibbing. Extensive damage over the Iron Range district.

- **July 21-22, 1972 Grand Daddy Flash Flood**

  10.84 inches fell in 24 hours was set at Fort Ripley (https://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/ff_PDF. This was the state record for a highest 24 hour total at a National Weather Service station until Hokah broke the record in 2007.
• June 28-29 and July 1-2, 1975, Northwest Minnesota

Geographically extensive and intense rains (https://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/ff) fall on eastern North Dakota and Northwest Minnesota in two separate events.

• July 23-24, 1987 Twin Cities Superstorm

Greatest calendar day precipitation on record for Twin Cities International Airport (https://files.dnr.state.mn.us/natural_resources/climate/summaries_and_publications/ff) with 9.15 inches.

• June 9-10, 2002 Northern Minnesota

48 hour rainfall totals topped 12 inches (/climate/journal/ff020609-10.html) in a some areas of Roseau and Lake of the Woods counties.

• June 22-23, 2002 Northern Minnesota

This event was so large (http://climateapps.dnr.state.mn.us/doc/journal/flash_floods/ff020622-23.htm), two different parts of northern Minnesota met the mega-rainfall definition used here.

• September 14-15, 2004 Southern Minnesota

More than ten inches of rain fell in a 36 hour period (/climate/journal/ff040914_15.html) in Faribault and Freeborn Counties.

• August 18-20, 2007 Southern Minnesota

Although the 1867 storm detailed above likely produced higher totals, the 15.10 inches measured one mile south of Hokah stands as the official record for 24-hour rainfall (/climate/journal/ff070820.html) at a Minnesota National Weather Service Cooperative station. The three day total for this station was 16.27 inches.

• September 22-23, 2010 Southern Minnesota

The National Weather Service site in Amboy measured 9.48 inches (/climate/journal/ff100924.html) on September 23, with 10.68 inches for the event.

• June 19-20, 2012 Northeast Minnesota

The two day total at Duluth was 7.24 inches (/climate/journal/duluth_flooding_120620.html). The St. Louis River at Scanlon set a new record crest at 16.62 feet, rising 10 feet in 24 hours.

• July 11-12, 2016, East-central Minnesota
Extreme rainfall affected a swath from the Brainerd Lakes area, eastward into Pine County (/climate/journal/160711_12_flood.html) (and also well into Wisconsin). Cloverton in Pine county recorded 9.34 inches.

- **August 10-11, 2016, Central Minnesota, Southeastern Minnesota**

  Two distinct areas received over 6 inches of rainfall (/climate/journal/160810_11_flood.html): one near Willmar, and another in Wabasha County. The highest total of 9.74 inches was recorded just east of Willmar.

For more information contact: climate@umn.edu (mailto:climate@umn.edu)
Nitrate Testing for Private Wells
Results as of March 22, 2018

The Minnesota Department of Agriculture (MDA) has designed a Township Testing Program to determine current nitrate-nitrogen concentrations in private wells. The initial criteria used to select townships for testing is based on the percentage of township land vulnerable to groundwater contamination (30% or greater) and amount of land in row crop production (20% or greater). The MDA uses the final results to determine if additional action is needed to minimize potential sources of nitrate pollution in the state’s groundwater.

Program testing and the summarizing of results are ongoing. Tables were created with current data, 3/22/2018.

**Table 1: Final Township Testing Results**

<table>
<thead>
<tr>
<th>County</th>
<th>Number of Townships Tested</th>
<th>Final Well Dataset</th>
<th>Number of Townships with Wells Over the Health Risk Limit (≥10 mg/L Nitrate-N) (Listed by percentage of wells exceeding the health risk limit.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Benton</td>
<td>3</td>
<td>472</td>
<td>1</td>
</tr>
<tr>
<td>Dakota</td>
<td>15</td>
<td>1179</td>
<td>4</td>
</tr>
<tr>
<td>Morrison</td>
<td>11</td>
<td>1104</td>
<td>3</td>
</tr>
<tr>
<td>Olmsted</td>
<td>11</td>
<td>923</td>
<td>10</td>
</tr>
<tr>
<td>Otter Tail</td>
<td>21</td>
<td>2276</td>
<td>15</td>
</tr>
<tr>
<td>Pope</td>
<td>6</td>
<td>283</td>
<td>6</td>
</tr>
<tr>
<td>Sherburne</td>
<td>6</td>
<td>1992</td>
<td>0</td>
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<tr>
<td>Stearns</td>
<td>14</td>
<td>1788</td>
<td>8</td>
</tr>
<tr>
<td>Wadena</td>
<td>4</td>
<td>224</td>
<td>1</td>
</tr>
<tr>
<td>Washington</td>
<td>2</td>
<td>441</td>
<td>0</td>
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**Table 2: Initial Township Testing Results-Final Township Testing Results are Not Yet Available**

<table>
<thead>
<tr>
<th>County</th>
<th>Number of Townships Tested</th>
<th>Number of Wells</th>
<th>Number of Townships with Wells Over the Health Risk Limit (≥10 mg/L Nitrate-N) (Listed by percentage of wells exceeding the health risk limit.)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;5%</td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clay</td>
<td>11</td>
<td>1159</td>
<td>11</td>
</tr>
<tr>
<td>Goodhue</td>
<td>22</td>
<td>2071</td>
<td>7</td>
</tr>
<tr>
<td>Fillmore</td>
<td>24</td>
<td>1477</td>
<td>2</td>
</tr>
<tr>
<td>Rice</td>
<td>4</td>
<td>478</td>
<td>3</td>
</tr>
<tr>
<td>Wabasha</td>
<td>14</td>
<td>1087</td>
<td>1</td>
</tr>
<tr>
<td>2015-2016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Becker</td>
<td>3</td>
<td>200</td>
<td>0</td>
</tr>
<tr>
<td>Benton</td>
<td>1</td>
<td>321</td>
<td>0</td>
</tr>
<tr>
<td>Dodge</td>
<td>7</td>
<td>654</td>
<td>3</td>
</tr>
<tr>
<td>Douglas</td>
<td>9</td>
<td>1864</td>
<td>7</td>
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<tr>
<td>Hubbard</td>
<td>6</td>
<td>1106</td>
<td>1</td>
</tr>
<tr>
<td>Kandiyohi</td>
<td>4</td>
<td>313</td>
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<td>Nobles</td>
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<td>Otter Tail</td>
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<tr>
<td>Rock</td>
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<td>171</td>
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</tr>
<tr>
<td>Todd</td>
<td>9</td>
<td>797</td>
<td>4</td>
</tr>
<tr>
<td>Winona</td>
<td>13</td>
<td>940</td>
<td>2</td>
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</table>
* The initial township testing results include data from all wells initially tested. An optional follow-up testing and well survey is offered to homeowners that have a presence of nitrate in their initial sample. Wells with nitrate-nitrogen results over 5 mg/L and a nearby non-fertilizer source or identified well problem are removed. The remaining wells form the final township testing well dataset.

** Additional information for these townships is available in Table 3.

**Table 3: Townships with > 40% of Wells Exceeding the Health Risk Limit (> 10 mg/L Nitrate-N)**

<table>
<thead>
<tr>
<th>County</th>
<th>Township</th>
<th>Years Sampled (initial, follow-up)</th>
<th>Total Wells</th>
<th>Number of Wells ≥ 10 mg/L Nitrate-N</th>
<th>Percentage of Wells ≥ 10 mg/L Nitrate-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dakota</td>
<td>Marshan</td>
<td>2013, 2015</td>
<td>95</td>
<td>41</td>
<td>43.2%</td>
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<tr>
<td>Morrison</td>
<td>Agram</td>
<td>2013, 2015</td>
<td>93</td>
<td>44</td>
<td>47.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>County</th>
<th>Township</th>
<th>Year Sampled</th>
<th>Total Wells</th>
<th>Number of Wells ≥ 10 mg/L Nitrate-N</th>
<th>Percentage of Wells ≥ 10 mg/L Nitrate-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nobles</td>
<td>Grand Prairie</td>
<td>2016</td>
<td>14</td>
<td>13</td>
<td>92.9%</td>
</tr>
<tr>
<td>Nobles</td>
<td>Westside</td>
<td>2016</td>
<td>15</td>
<td>13</td>
<td>86.7%</td>
</tr>
<tr>
<td>Nobles</td>
<td>Lismore</td>
<td>2016</td>
<td>7</td>
<td>5</td>
<td>71.4%</td>
</tr>
<tr>
<td>Nobles</td>
<td>Olney</td>
<td>2016</td>
<td>9</td>
<td>4</td>
<td>44.4%</td>
</tr>
<tr>
<td>Rock</td>
<td>Clinton</td>
<td>2016</td>
<td>10</td>
<td>8</td>
<td>80.0%</td>
</tr>
<tr>
<td>Rock</td>
<td>Battle Plain</td>
<td>2016</td>
<td>23</td>
<td>15</td>
<td>65.2%</td>
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<td>Fremont</td>
<td>2016</td>
<td>42</td>
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<tr>
<td>Winona</td>
<td>Utica</td>
<td>2016</td>
<td>86</td>
<td>40</td>
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Additional Information
Township Testing Program: www.mda.state.mn.us/townshiptesting

Minnesota Nitrogen Fertilizer Management Plan (NFMP): To learn more about the NFMP, the state’s blueprint for preventing or minimizing impacts of nitrogen fertilizer on groundwater, visit: www.mda.state.mn.us/nfmp.

Funding Acknowledgement
Funding for this project is provided by the Clean Water, Land and Legacy Amendment.

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.

March 2018
Winona County: Final Overview of Nitrate Levels in Private Wells (2016-2017)

The Minnesota Department of Agriculture (MDA) determines current nitrate-nitrogen concentrations in private wells, on a township scale, through the Township Testing Program. The MDA has identified townships throughout the state that are vulnerable to groundwater contamination and have significant row crop production. The MDA plans to offer nitrate testing to more than 70,000 private well owners in over 300 townships by 2019.

Each selected township is offered testing in two steps, the “initial” sampling and the “follow-up” sampling. In the initial sampling, all township homeowners using private wells are sent a nitrate test kit. If nitrate is detected in their initial sample, the homeowner is offered a follow-up nitrate test, pesticide test and well site visit. Trained MDA staff visit willing homeowners to resample the well and then conduct a site assessment. The assessment helps to identify possible non-fertilizer sources of nitrate and to see the condition of the well. A well with construction problems may be more susceptible to contamination.

The MDA and Winona County Environmental Services worked together to select townships and implement the nitrate testing project. The following townships were selected: Elba, Fremont, Hart, Hillsdale, Mt. Vernon, Norton, Pleasant Hill, St. Charles, Saratoga, Utica, Warren, Wilson, and Wiscoy. The initial sampling in Winona County started in 2016 and follow-up sampling ended in 2017.

Results

Two datasets are used to evaluate nitrate. The initial well dataset contains 940* wells; the final dataset contains 731 wells. Wells that had nitrate-nitrogen results over 5 mg/L were removed from the initial dataset if a non-fertilizer source or well problem was identified, to form the final well dataset. A total of 209 wells (22%) were removed. The results from the initial and final well datasets are summarized in the table below.

In Fremont, Saint Charles, Utica, and Warren Townships, more than 10% of the wells were over the Health Risk Limit of 10 mg/L of nitrate-nitrogen (map below). The percent of wells over the Health Risk Limit in each township ranged from 0% to 42.9%. The Winona County Final Report will be available on the MDA website in 2018: [www.mda.state.mn.us/townshiptesting](http://www.mda.state.mn.us/townshiptesting).

Next steps

The MDA uses the final well dataset to determine if additional action is warranted, as described in the Minnesota Nitrogen Fertilizer Management Plan (NFMP). The MDA uses the assessment process and prioritization guidelines in the NFMP to determine next steps. Find more information about the NFMP on the MDA website at [www.mda.state.mn.us/nfmp](http://www.mda.state.mn.us/nfmp).

Funding Acknowledgement

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Published May 2018
Table: Winona County Private Well Nitrate Results, 2018.

<table>
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<tr>
<th>Township</th>
<th>Initial Well Dataset</th>
<th></th>
<th>Final Well Dataset</th>
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<td><strong>Total Wells</strong></td>
<td><strong>Percent of Wells ≥10 mg/L Nitrate-Nitrogen</strong></td>
<td><strong>Total Wells</strong></td>
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<td>62</td>
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<td>Utica</td>
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<td>Warren</td>
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<td>Wilson</td>
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<td>Wiscoy</td>
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<tr>
<td>Total</td>
<td>940</td>
<td>19.1%</td>
<td>731</td>
<td>7.1%</td>
</tr>
</tbody>
</table>

* All well types included.

Figure: Winona County Final Well Dataset Map, 2018.

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Animal Manure Management

RCA Issue Brief #7 December 1995

What are organic by-products, and how are they quantified?
How much manure can actually be collected?
How much manure do different types of livestock produce?
Recoverable manure, by livestock type
What natural resource problems are associated with manure management?
What are the trends in manure production?
Animal population summaries, 1994
What can be done?
How does manure management help?

Did you know ...

...that the manure from a dairy milking 200 cows produces as much nitrogen as is in the sewage from a community of 5,000-10,000 people? Or that the annual litter from a typical broiler house of 22,000 birds contains as much phosphorus as is in the sewage from a community of 6,000 people?

...that any increase in animal numbers results in an equal increase in the problems arising from manure collection, storage, treatment, and utilization?

...that beef production in the United States decreased almost 15 percent between 1982 and 1992, while broiler production increased 59 percent and turkey production increased 62 percent, with a corresponding increase in manure and other residual materials?

Words are important!

Richard Kashmanian, in an editorial for BICOCYCLE, stresses the importance of words. He points out that words such as "wastes," "garbage," and "trash" send negative signals to readers or listeners and set in motion a sequence of events that is difficult to reverse.

The following definitions are taken from Webster’s New Collegiate Dictionary: "Waste: garbage, rubbish, discarded as worthless, defective, or of no use." Dispose: "to get rid of." Various synonyms listed in Webster’s New World Thesaurus for waste are "garbage, refuse, filth, litter, debris, and junk." Not very attractive!

Efforts are underway by various groups to change the vocabulary used to define their products or services. For example, the American Forest and Paper Institute is discontinuing the use of the term "waste paper" when referring to recycled paper. The Water and Environment Federation, formerly the Water Pollution and Control Federation, is using the term "biosolids" to refer to or define the largely organic material commonly called "sludges."

More and more, the agricultural sector recognizes that the reference to livestock manure as livestock "waste" has helped lead to the undervaluation of manure as a source of nutrients, the loss of manure nutrients through mishandling and misapplication, and the overapplication of manure to the land. Understanding that a term’s use implies a value, the agricultural sector can replace the use of the word "waste" with "manure," "residuals," or "by-products."

What are organic by-products, and how are they quantified?

Organic by-products, or "wastes," of the livestock industry include a variety of materials such as solid and liquid animal manures, used bedding, spilled feed, and a variety of other substances. Most livestock-associated organic by-products are animal manures.

The amount and consistency of manures varies with animal type, climate, feed ration, animal age and health, and other factors. To compare manure production between animal types or between animals of the same type, manure production is expressed in terms of 1,000-pound animal units. For reference, a single dairy cow weighs about 1,400 pounds, or 1.4 animal units. A typical steer weighs about 1,000 pounds, or 1 animal unit, and most hogs weigh between 200 and 300 pounds; or 0.2 to 0.3 animal unit. A mature broiler, on the other hand, weighs between 4 and 5 pounds, so it takes as many as 250 birds to make up an animal unit.
Minnesota Department of Health

Nitrate in Well Water
Well Management Program

On this page:
Introduction
What is nitrate?
How does nitrate get in well water?
What are the health risks of nitrate in well water?
Why are young infants more susceptible?
How much nitrate is too much?
How do I know if my well water has nitrate?
How often should I have my well tested for nitrate?
What if nitrate is found in my water?
What about a water treatment unit?
Should I test my well water for anything other than nitrate?

Introduction
Nitrate is a common contaminant found in many wells in Minnesota. Too much nitrate in drinking water can cause serious health problems for young infants. This page provides a basic explanation of nitrate in wells and gives steps that you as a well owner can take to protect your family and visitors from illness.

What is nitrate?
Nitrate (NO<sub>3</sub>) is a naturally occurring chemical made of nitrogen and oxygen. Nitrate is found in air, soil, water, and plants. Much of the nitrate in our environment comes from decomposition of plants and animal wastes. People also add nitrate to the environment in the form of fertilizers.

How does nitrate get into well water?
Natural levels of nitrate in Minnesota groundwater are usually quite low (less than 1 milligram per liter [mg/L] of nitrate-nitrogen). However, where sources of nitrate such as fertilizers, animal wastes, or human sewage are concentrated near the ground surface, nitrate may seep down and contaminate the groundwater. Elevated nitrate levels in groundwater are often caused by run-off from barnyards or feedlots, excessive use of fertilizers, or septic systems.

Wells most vulnerable to nitrate contamination include shallow wells, dug wells with casing which is not watertight, and wells with damaged, leaking casing or fittings.

Nitrate contamination of a well is often regarded as a first sign of deteriorating groundwater quality.

What are the health risks of nitrate in well water?
Too much nitrate in drinking water poses a risk to infants under six months of age. If an infant is fed water or formula made with water that is high in nitrate, a condition called "blue baby syndrome" (or "methemoglobinemia") can develop. Bacteria which are present in an infant's stomach can convert nitrate to nitrite (NO<sub>2</sub>), a chemical which can interfere with the ability of the infant's blood to carry oxygen. As the condition worsens, the baby's skin turns a bluish color, particularly around the eyes and mouth. If nitrate levels in the water are high enough and prompt medical
attention is not received, death can result. See also (http://www.health.state.mn.us/divs/eh/wells/waterquality/safebaby.html): Safe Drinking Water For Your Baby. (http://www.health.state.mn.us/divs/eh/wells/waterquality/safebaby.html).

Why are young infants more susceptible?
As an infant ages, its stomach acidity increases, reducing the numbers of nitrite-producing bacteria. After six months, the conversion of nitrate to nitrite in the stomach no longer occurs. Most adults can consume large amounts of nitrate with no ill effects. In fact, the average adult in the United States consumes about 20-25 milligrams of nitrate-nitrogen every day in food, largely from vegetables.

Pregnant women, people with reduced stomach acidity, and people with certain blood disorders may also be susceptible to nitrate-induced methemoglobinemia. Some research has suggested that nitrate may also play a role in the development of some cancers. However, at this time there is no clear evidence that nitrate ingestion results in an increased cancer risk.

How much nitrate is too much?
The federal drinking water standard for nitrate is 10 mg/L of nitrate-nitrogen, which provides newborns with reasonable protection against blue baby syndrome. This level is mandatory for all public water systems, and recommended for private wells.

How do I know if my well water has nitrate?
Nitrate is tasteless, odorless, and colorless. To find out if there is nitrate in your water, have it tested by a laboratory that is certified for nitrate testing by the Minnesota Department of Health. Laboratories will provide sampling bottles and instructions. Visit the Environmental Laboratory Accreditation Program (https://eldoweb.health.state.mn.us/public/accreditedlabs/labsearch.seam) website for all your water testing needs. Regardless of which tests you want done, always make sure to use a laboratory that has been certified to perform each of those particular tests.

How often should I have my well tested for nitrate?
It’s a good idea to have a routine nitrate test every two or three years, more frequently if nitrate has been detected in previous sampling. State regulations require well contractors to have a water sample tested for bacteria and nitrate when they construct a new well. After that, owners of private wells must arrange for their own water testing.

You should also have your water tested for nitrate if you are a woman planning on becoming pregnant or if infants will be using the water.

What if nitrate is found in my water?
1. If the nitrate-nitrogen concentration exceeds the health limit of 10 mg/L, do not give the water to any infant under six months of age, either directly or in formula. Infants should be provided with water from a source which has been tested and shown to be low in nitrate and bacterially safe. Commercially bottled water is required to meet the nitrate standard.
2. Do not boil to "treat" high nitrate water. Nitrate is not removed from the water by boiling. Boiling actually concentrates the nitrate, due to evaporation of the water.
3. Have your well inspected. It’s a good idea to have your well inspected by a licensed well contractor if the well is old, or you do not know if it is structurally sound. Nitrate and bacteria problems are sometimes caused by structural flaws which allow contaminated surface water to enter the well. Repairing the well or constructing a new, deeper well often results in a results in a significant reduction in the nitrate level. To find licensed well drillers (http://www.health.state.mn.us/divs/eh/wells/lwc/index.html) in your area, look in the Yellow Pages under "Well Drilling and Service."
4. Identify and remove sources of nitrate near the well. Fertilizers, animal wastes, and sewage systems should be located and managed so that they do not contaminate the well. If a nitrate source is too close to the well and
cannot be moved, then you may need to consider having the well permanently sealed and replaced by a licensed well contractor.

What about a water treatment unit?
Home water treatment units are not recommended for treating high nitrate water which will be given to infants. There is no foolproof way of knowing when the treatment system may fail, and blue baby syndrome has been known to occur after just one day of exposure to high nitrate water.

Should I test my well for anything other than nitrate?
Yes. Private wells should be tested at least once a year for bacterial safety. It is also wise to test well water for bacteria any time the water changes in taste, odor, or appearance. See also: Bacterial Safety of Well Water (http://www.health.state.mn.us/divs/eh/wells/waterquality/bacteria.html).

In addition, water can absorb lead from old lead pipes, lead-soldered copper pipes, or brass plumbing components, when the water stands idle in the pipes for more than a few hours. It is recommended to either flush standing water until you feel the water get colder (usually 30-60 seconds), or have your water tested for lead after it has been standing in the pipes at least six hours. Also, never use water from hot water faucets for drinking or cooking. See also: Lead in Well Water Systems (http://www.health.state.mn.us/divs/eh/wells/waterquality/lead.html).

Arsenic occurs naturally in about half the wells in Minnesota, and about 10 percent of wells produce water which exceeds 10 micrograms per liter (parts per billion), the federal drinking water standard. Arsenic is more prevalent in western Minnesota, but can occur almost anywhere in the state (see map on arsenic occurrence (http://www.health.state.mn.us/divs/eh/wells/waterquality/arsenicmap.pdf)). Long-term consumption of arsenic above the drinking water standard may increase the risk of health problems of the skin, circulatory system, nervous system, lungs, and bladder, including some forms of cancer. Every private well should be tested at least once or twice to determine if arsenic is present in the water. See also: Arsenic in Minnesota's Well Water (http://www.health.state.mn.us/divs/eh/wells/waterquality/arsenic.html).

Other contaminants sometimes occur in private water systems, but much less frequently than bacteria, nitrate, arsenic, or lead. If the well is located close to fuel tanks or to a commercial or industrial area, a test for "volatile organic chemicals" (VOCs) is a good idea. A brochure, VOCs, is available from the MDH. Agricultural chemicals are sometimes found in wells located near cropped fields or handling areas for agricultural chemicals. Shallow wells are more vulnerable to pesticide contamination than are deep wells. If your well is located in an agricultural area, and especially if it is a shallow well, testing for several of the pesticides most commonly used in the area may be warranted.

If children or adolescents are drinking the water, a test for natural levels of fluoride will give your dentist useful information when considering fluoride supplements. A small number of wells in Minnesota (primarily northeastern Minnesota) do have naturally-occurring levels of fluoride that exceed the health standard.

Questions?
Contact the MDH Well Management Section
651-201-4600 or 800-383-9808
health.wells@state.mn.us

Minnesota Department of Health
Updated Thursday, June 28, 2018 at 10:18AM
Dear Ms. Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates” (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400’ X 400’ X 16’ manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events—since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take—if restoration is even possible.

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on
our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult to trust that the MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

Sincerely,

Aleta Borrud
2411 Merrihills Dr SW, Rochester
Rochester, MN 55902-1165
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Ryan Franke
3641 10th Ave. South Apt. #3
Minneapolis, MN 55407
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Sincerely,

Mark Erickson
50114 140th Street
Donnelly, MN 56235
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Sincerely,

Sandra D Jones
5567 Spruce Road
Mound, MN 55364
-----Original Message-----
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com> On Behalf Of janettenoelle@gmail.com
Sent: Thursday, November 15, 2018 11:57 AM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP

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Sincerely,

Janette Dean
103 N. Gjere Avenue, #5
Caledonia, MN 55921
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As a personal comment, there is no doubt in my mind that the proposed mega dairy in S E Minnesota is not wanted nor needed. The effect to the land, water and even air is appalling. The quote by Mahatmas Gandhi seems to apply here---"Earth provides enough to satisfy every man's needs but not every man's greed". Sincerely, Becky Ault

Sincerely,

Becky Ault
51564 262 St.
Austin, MN 55912
Hello Ms Grosenheider

Attached are my comments on the Daley Farm Expansion EAW near Lewiston, MN.

Best regards,

Calvin Alexander

--

E. Calvin Alexander, Jr.
Morse-Alumni Professor Emeritus
Earth Sciences Department
University of Minnesota
John T. Tate Hall, Room 150
116 Church Street SE
Minneapolis, MN 55455
alex001@umn.edu
(612) 624-3517
Introduction:

The proposed Daley Farms expansion, if approved and constructed, will create a significant environmental risk to the Lewiston area. The site is surrounded by many sinkholes. Many of the wells in the first two aquifers under the area are already at or above the nitrate-nitrogen drinking water standard. The Lewiston Waste Water Treatment Lagoon catastrophically collapsed (Jannik et al., 1992). The failed lagoon is about 1.8 miles southeast of the Daley Farms site -- at approximately the same elevation and in the same hydrogeologic stratigraphic environment.

Mapped Sinkhole:

There is a mapped sinkhole, MN85:D00422 (hereafter D422), in the Minnesota Karst Features Data base that is about 450 feet from the existing manure storage lagoons at the Daley Farm operations. The feature is readily visible on historic air photos and is shown as a pond on the USGS topo sheet of the area. “The Daley Family describes the feature as a landfill that was miss-classified as a sinkhole in the 1980s and they do not recall any subsidence during the years they have lived on the farm.” (Dogwiler, 2015, p. 6) That feature was later filled as part of a grassed water way construction. Two Electrical Resistivity Imaging lines (ERI) were conducted at the site by Professor Toby Dogwiler (then at Winona State University -- currently at Missouri State University, Springfield, MO) in April 2015. Professor Dogwiler's ERI specifically ran two ERI lines across the mapped location of D422. Those two lines are reproduced below as Professor Dogwiler’s Figures 12 and Figure 11.

Figure 12, the ERI line down the axis of the grassed waterway, shows an approximately 30 m deep pit in the bedrock surface at D422's location (shown by the added dashed rectangle in Figure 12). Professor Dogwiler interpreted this apparent bedrock pit as an artifact of the disturbed and compacted materials used to fill the depression before and during the construction of the grassed waterway. Last week at the 2018 Geological Society of America’s annual meeting in Indianapolis, IN, I discussed the Daley Farms ERI study with Professor Dogwiler. He quickly reviewed his interpretation and said that he was comfortable with his
interpretation of the line -- but would check with a couple of his ERI mentors to see what they felt about his interpretation.

Professor Dogwiler, however, was not aware of the EAW for an expansion to almost 5000 dairy cows. In view of that proposal, given that development he recommended that the ERI results from his lines 5 and 6 below should be ground truthed with deep drilling and/or deep back hoe excavations. I share that recommendation and it was supported by two karst hydrogeologists who routinely use ERI to characterize sites in karst who looked at the Daley Report at my request.

**ERI Images of D422**
Reproduced below are the two ERI lines crossing mapped sinkhole D422 from Dogwiler's (2015) Daley Farms study. The area of the mapped sinkhole is outlined in the black dashed rectangle. Dogwiler’s Fig. 12 (line 6) ran down the axis of the grassed waterway through D422. This figure shows the prominent, roughly 30 m deep, apparent pit in the surface of the red bedrock. This is the feature Professor Dogwiller interpreted as an artifact of the compacted fill near the surface.

![ERI Image of D422](image_url)

*Figure 12. A profile of ERI Line 6 (see Figures 1 and 2 for the location of the line and Figure 7 for an overview of interpreting ERI profiles and the characteristics of different types of ERI arrays).*
Professor Dogwiller’s Figure 11 (line 5) below was run across the location of D422 perpendicular to line 6. The near surface, red, compacted fill is not evident in this ERI line but there is still a clear, roughly 10 me deep depression in the surface of the bedrock -- consistent with D422 being a filled sinkhole.

Recommendation:

Given the prominent karst features all around the Daley Farms site, the nearby catastrophic collapse of the Lewiston Waste Water Treatment Lagoon on similar karst stratigraphy, the documented growing nitrate pollution of Lewiston’s wells and many local wells, and the enormous size of this proposed CAFO this facility should not be permitted at this site without a full scale EIS.

If this EAW is approved it should be contingent on a deep excavation of the D422 feature to check Professor Dogwiller’s interpretation. Simple soil borings to
“refusal” will not be sufficient. Given that the Daley’s used the site as a landfill before it was converted to a grassed waterway, there are probably metal or demolition debris in the fill that will stop a soil boring. An extensive, deep excavation of D422 will be necessary to document what the feature actually is.

If it is a filled sinkhole, the expansion should not be permitted.

References:
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PS - this operation needs to be reviewed for "sink holes" in the Karst topography --- as within 5 miles of the farming operations - is the City of Lewiston. That City lost its sewage system ponds about 20 years ago, as they "dropped" out of the bottom- due to the Karst topography.

Concerns for keeping our water aquifers from pollution. This is for animals and humans - clean water is the "life blood" for all living creatures. Prevention is better than expensive water treatment if pollution occurs.

Lynn Theurer - Winona Co. Citizen - former Public Health Nurse

Sincerely,

Lynn Theurer
498 Kerry Court
Winona, MN 55987
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Sincerely,

Denise Zabinski
26320 State Highway 78 NW
Ashby, MN 56309
Kim Grosenheider,

Attached is the Winona County Planning and Environmental Services comments on the Daley Farms of Lewiston, LLP expansion EAW.

Thank you,

Carly McGinty
Feedlot Officer
Winona County
177 Main Street
Winona, MN 55987
(507) 457-6580
11/15/2018

Kim Grosenheider
Resource Management and Assistance Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155

Re: Daley Farms of Lewiston, LLP EAW, Utica Township, Winona County, MN

Ms. Grosenheider,

Winona County Planning and Environmental Services Department appreciates the opportunity to comment on the Daley Farms of Lewiston, LLP Environmental Assessment Worksheet (EAW).

Upon review of the Daley Farms of Lewiston, LLP EAW, the following comments by the Winona County Planning and Environmental Services Department (Feedlot Division) are provided:

On page 7, section B: Compatibility with plans and land use regulations. Is the project subject to any of the following adopted plans or ordinances?

- The expansion is subject to the Winona County Local Comprehensive Plan.
  - Winona County’s Comprehensive Plan section of Natural Resource Protection, Goals state:
    - Goal 1: Protection and enhancement of the air, water and land resources in the County as a vital ingredient of the living environment.
    - Goal 6: A water quality level in the County that at a minimum is equivalent to the national goals of fishable and swimmable. Fishable and swimmable being defined as water capable of supporting healthy fish populations and safe for normal body contact. *(Extreme rainfall events could provide impacts in this area).*
    - Protection of all water resources in the County from sources of pollution.
  - Winona County’s Comprehensive Plan section of Natural Resource Protection, Policies state:
    - Policy 17: Control the location and size of feedlots and other animal confinement areas in the County following the State regulations, to minimize pollution and nuisance problems using nutrient management requirements and acreage for manure spreading to determine carrying capacity. *(Over application of manure could impact surface and groundwater if not handled properly).*
The expansion is subject to the Lewiston Wellhead Protection Plan.

General Comments regarding MMP:
The Daley farm expansion Manure Management Plan (MMP) states that 4,083.3 acres of land is needed to spread manure within the proposed feedlot expansion. Of these spreadable acres, 2385 acres are owned by the Daley family, and 1698.3 acres are rented or available. Verbal agreements are mentioned as part of the total spreadable acreage management plan for renters and might need to be addressed in a more formalized manner for verification.

Sincerely,

Winona County
Planning and Environmental Services Department
177 Main Street
Winona, MN 55987
Dear Ms Grosenheider:

I am a retired watershed biologist (USFWS) who spent the last 25 years of my career working in the area that would be affected by this expansion, in an effort to keep eroded sediment, nutrients and other harmful pollutants and contaminants from further damaging our streams and Mississippi River backwater habitats - this is the most biologically diverse and ecologically fragile part of the state.

Rules and restrictions have been created to protect this landscape and its inhabitants from further damage in an ongoing effort to restore water quality and landscape integrity. These limits on further land use intensification, ownership consolidation and resource exploitation need to be upheld rather than diluted or compromised for private profit at public expense. The state's future depends on it.

I concur with the following comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.

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Climate change has increased intense rainfall events—since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

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The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult to trust that the MPCA will be thorough enough in its oversight and enforcement - as time passes and its workload increases despite staffing limitations - to prevent noncompliance and resulting environmental impacts and costs.

Sincerely,

Arthur S. Hawkins
Retired Biologist and WSU Sustainability Advisor

Sincerely,

Arthur Hawkins
318 West King St.
Winona, MN 55987
Hi Kim,

Attached are comments from the DNR.

Becky

Rebecca Horton  
Region Environmental Assessment Ecologist | Ecological and Water Resources

Minnesota Department of Natural Resources
1200 Warner Road
St. Paul, MN 55404
Phone: 651-259-5755
Fax: 651-772-7977
Email: becky.horton@state.mn.us
mndnr.gov
November 13, 2018

Kim Grosenheider
520 Lafayette Road North
Saint Paul, MN 55155

RE: Daley Farms EAW

Dear Kim Grosenheider,

The Minnesota Department of Natural Resources (DNR) has reviewed the Environmental Assessment Worksheet (EAW) for the Daley Farms dairy expansion in Winona County. Regarding matters for which the DNR has regulatory responsibility or other interests, we offer the following comments for your consideration.

Item 2C (pages 7 – 9) does not describe the Rush Creek Aquatic Management Area (a public recreation area), Rush Creek, a designated trout stream, or the designated trout stream tributaries that lie nearby some of the manure application Sites (Matt’s, Lappiers, and Orlies). Rush Creek is one of Minnesota’s premier trout streams. These resources, and any project-related impacts to these resources, should be discussed and any measure to minimize and avoid adverse impacts should be described.

It is not clear if a karst walk has occurred on the project site or on all proposed manure application sites in order to determine presence of karst features, or if the information provided in the EAW is from the publicly available “Karst Feature Inventory Points” GIS data layer. Within this GIS data layer, an unverified sinkhole is shown within manure application Site 4. This sinkhole appears on the map in Attachment F, however this feature is not shown on the associated map for the site in Attachment G. Also, not all of the maps within Attachment G show all sinkholes mapped in the Karst Feature Inventory Points GIS layer; for example, the map for Site 39 shows a sinkhole to be present along the northern edge of the site, however, this same sinkhole is not shown on the map for Site 25, which is directly adjacent to the north. The DNR recommends that these maps be updated to be accurate so that it is clear where sinkhole application restrictions are required. Since new sinkholes can appear, we also recommend that karst walks be completed yearly, in order to accurate changes and properly inform permitting.

As noted in the EAW, Daley Farms currently has a DNR Water Appropriation Permit (No. 2010-0352) for the existing facility. DNR Water Appropriation Permit 2010-0352 authorizes the use of up to 30.0 million gallons per year from two wells at a combined rate of 160 gallons per minute for the use of livestock watering. The addition of two new installations (wells) required a DNR preliminary well assessment (2017-4001). After the wells are constructed, DNR Water Appropriation Permit 2010-0352 will need to be amended to reflect the existence and use of the new wells, as well as the additional water use. If the pump test for the new wells indicate that it is likely that the wells will interfere with neighboring wells or trout streams, then an aquifer test may be required for the facilities.

On behalf of the DNR, thank you for consideration of these comments.

Sincerely,

/s/ Rebecca Horton
Region Environmental Assessment Ecologist
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Sincerely,

Jill Crafton
10351 Decatur Ave S
Bloomington, MN 55438
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Sincerely,

John King
15125 County Road 38
Long Prairie, MN 56347
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Sincerely,

Nancy Wagner
23133 Highway 14
Lewiston, MN 55952
Subject: Daley Farms proposal

Dear Kim Grosenheider,

Just a quick note here respectfully but strongly suggesting that a comprehensive EIS be completed before determining whether to move forward on the Daley Farms proposal.

I have many relatives in Winona--and Wabasha--County and I know their concerns about protecting water resources as well as community life. At a minimum, they, we all, deserve a full EIS before making such a consequential decision. It's simply the right thing for our precious resources, the environment, the people and our fragile democracy. Please do what is right now and for our shared future.

Thank you very much.

Tom Richards
Rural Barnum, Minnesota
Dear Ms Grosenheider:

I represent People’ Food Co-op of Rochester, Minnesota. We have 3,614 owners in the southern Minnesota area. To serve our customers, we purchase millions of dollars annually from 200 farms in Minnesota, Wisconsin and Iowa.

Our owners and farmers are concerned about the potential for groundwater pollution food to mega-dairies.

Requiring an EIS on the Daley farm is a matter of putting human health, and our natural resources, in priority positions for Minnesota citizens.

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

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Sincerely,

Lizzy Haywood
519 1st Ave south
Rochester, MN 55902
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Sincerely,

Mary Lundell
33100 42nd Ave
Cannon Falls, MN 55009-7362
Dear Ms Grosenheider:

I live in the town of Rollingstone, less than 20 miles from the Daley Farms of Lewiston. As a neighbor and 25-year resident of rural Winona County, I am concerned about the Daley Farms' proposed expansion for a variety of reasons, many of them enumerated in concerns already sent to you by others.

I very much want to see the MNPCA require a full Environmental Impact Statement that addresses those concerns, including:
1. risk of groundwater contamination from runoff 2. risk of contamination of drinking water in the event of failure of manure containment caused by potential sinkhole collapse or other unforeseen causes 3. probable presence of pesticides concentrated in runoff and leakage 4. planning for additional risk from extreme climate events 5. effects on nearby municipal and private wells of using 92 million gallons of water annually (nearly three times as much as nearby Lewiston!) 6. Daley's record of noncompliance with Federal pollutant discharge requirements at 3 of 4 other facilities 7. impact on geography, air quality, and general perceived quality of life in areas of Winona County within vicinity of Daley Farms

I understand that some Winona County residents who live near the Daleys are supportive of their expansion plan. While it's nice to know that the Daleys have been good neighbors and employers, that is not nearly sufficient to answer the various scientific and health concerns related to this project.

Please fulfill your regulatory responsibilities and require an EIS, containing specific, enforceable answers in regards to these and any other serious concerns about the Daley mega-dairy proposal. Thank you!

Sincerely,

Scott Lowery
461 Sunnyview Drive
Rollingstone, MN 55969
Dear Ms Grosenheider:

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

The Daley Farms expansion would come at too big a cost. I urge you to conduct a full environmental review of the impacts.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Three of southeastern Minnesota’s 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewiston in 1991, and Bellechester in 1992. The Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

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-----Original Message-----
From: mailagent@thesoftedge.com <mailagent@thesoftedge.com>
Sent: Wednesday, November 14, 2018 9:47 PM
To: Grosenheider, Kim (MPCA) <kim.grosenheider@state.mn.us>
Subject: Request for Environmental Impact Statement on Daley Farms of Lewiston, LLP
For all the reasons outlined above, an EIS is needed.

Sincerely,

Hilary Reeves
210 North 2nd St.
Minneapolis, MN 55401
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Bonnie Nord
2027 Worcester Ave
Saint Paul, MN 55116
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Sincerely,

Roger Wacek
646 E Vine St, Owatonna, MN
Owatonna, MN 55060-2521
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Sincerely,

Keith Johnson
340 N Minnesota St
Muscoda, WI 53573-9496
Dear Ms Grosenheider:

I agree with the following statements. No one operation should be allowed to use so much water with so many potential problems surrounding it.

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Laurie Hougen-Eitzman

Sincerely,

Laurie Hougen-Eitzman
10752 Nerstrand Blvd
Nerstrand, MN 55053
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414 Goodrich Ave
St Paul, MN 55102
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Judith Moore
1430 Independence Ave. S.
St. Louis Park, MN 55426
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During the public information session in Lewiston, MPCA feedlot official, Mark Gernes, stated that 3 out of 4 of the Daley's existing facilities are out of compliance with Federal pollutant discharge requirements. It is difficult to trust that the MPCA will be thorough in oversight and enforcement when years go by with full awareness of active noncompliance.

Sincerely,

Douglas Anderson
21 Malcolm ave SE
Minneapolis, MN 55414
Dear Ms Grosenheider:

Good sunny crisp afternoon as I add my comments to prepared comments that I agree with.

I am a grazing diary farmer residing and farming in Canton Township of Fillmore County. I am not typically against dairy farming, but this dairy farming plan has too many concerns to be allowed to operate. My primary concern is for the water quality and quantity. Aquifers are not being recharged at the same pace that we draw water out, and this will exacerbate the issue. Water quality will be at risk from any possible leaks or over application of manure. We can employ the best of engineers, construction workers, maintenance workers, and still these lagoons can and will leak, allowing manure to enter the karst water channels. I have places on my farm where the water appears or disappears. That farm proposal may be approximately 45 miles from me, but water channels travels that far and more. It is even riskier if these dairy operators have not kept their other farms in compliance.

The water draw and the amount of manure concentration is of the magnitude that an EIS (Environmental Impact Statement) should be done. Other factors such as air quality, community impacts should also be studied. I have a friend and colleague farming by Kerkhoven, Minnesota, and he tells me of the community negative issues with the expanding dairies in his neighborhood. The manure pipes and extra tractor/truck traffic is only one of the magnifide concerns in addition to the water quality and quantity. Business growth of this type and size is not automatically acceptable.

I am submitting comments to the Environmental Assessment Worksheet (EAW) on the Daley Farms of Lewiston, LLP in Winona County. The proposed expansion of 3,000 cows would result in a total of 4,628 cows, calves and heifers, making this one of the largest dairies in the state. For perspective, Over 96% of dairies in Minnesota are 500 cows or smaller and 86% are less than 200 cows.

The proposal will produce 46 million gallons of liquid manure and wastewater in an area where karst geology channels contaminants from the surface deep into the ground. Well testing conducted by the Minnesota Department of Agriculture in 2016 shows that, "...46.3% of the wells tested in Utica Township exceeded the safe drinking water standard for nitrates" (www.mda.state.mn.us/townshiptesting) USDA Natural Resources Conservation Service studies indicate that 250 cows produce as much nitrogen as 5,000 people. The impact of this increased nitrogen load must be fully analyzed through an EIS (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211).

This factory dairy operation, with its new 13.6-million-gallon manure pit, is proposed in a high-risk karst area. Three of southeastern Minnesota's 22 municipal sewage lagoons have collapsed due to sinkholes opening beneath them: Altura in 1976, Lewistan in 1991, and Bellecheester in 1992. After expansion, in total all of the manure lagoons at the Daley Farms facility will be able to store 35.6 million gallons of raw liquid manure. The three actions that encourage sinkhole development in karst country are: moving earth (digging, displacement), pumping water, and storing water. All three actions would be involved if the proposed 400' X 400' X 16' manure pit were to be constructed. Therefore, the Minnesota Pollution Control Agency must analyze what the impact of a catastrophic failure of the new 13.6-million-gallon manure pit would be, and that requires an EIS.

We know that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides. Pesticide measurement and mitigation is not addressed in the EAW. Also, western Winona County is informally known as a "cancer cluster" as cancer rates are already high in this area. It would stand to reason that threats to human and animal health is threatened in an already compromised region when additional carcinogens are added to the environment through run-off and leakage of contaminated water.
The EAW indicates that groundwater is present at average depths of between 16 and 20 feet only in the area where manure storage is planned. Leakage from the lagoon, even without a lagoon failure, will quickly impact and pollute groundwater.

Climate change has increased intense rainfall events--since 2004 in southern Minnesota alone, there have been three mega-storms with rainfall totals over 9 inches during 24- to 36-hour periods. The capacity of the proposed lagoon is not designed to handle this kind of rainfall situation (https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html).

This project would annually use 92 million gallons of water. The nearby city of Lewiston (pop. 1,564) uses 33.5 million gallons per year. The impact of this additional major draw of water on the local aquifer must be analyzed through an EIS. The Department of Natural Resources, in its analysis of an initial permit for drilling of an additional well for this expansion, stated that: "...the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands." If lakes, streams and wetlands are negatively impacted, there must be a detailed analysis as to how that damage would be undone and how long restoration might take--if restoration is even possible.

The economic impact of this operation needs to be analyzed, especially its impact on the many neighboring family-owned and moderate-sized dairy farms. Increased consolidation in the dairy industry will have a devastating impact on our rural community, and an EIS is needed to evaluate this. In addition, the impacts to roads needs assessment and only an EIS will address that.

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Sincerely,

Bonnie Haugen
12620 Deer Rd
Canton, MN 55922
I am writing to express my concerns about the Daley’s application to expand their dairy operation in Winona County.

Winona County has serious issues with nitrate contamination of ground water. This is not a new situation and monitoring going back to the 80’s confirms this. Utica Township where the Daley Farm is located has a very high level of nitrates in the wells tested. It is part of a "cluster" of townships: Utica, St. Charles, Warren and Fremont with the highest levels of nitrate contamination in the County. Not coincidentally it is an area of concentration of livestock operations. Two large expansions have recently been permitted in that area, both of them increasing their number of animals to just under the animal unit cap. One of these is a dairy SW of Lewiston in Utica Township, and the other, Holden Farms, is in St. Charles Township. Daley’s expansion would be the third and largest in an already compromised area.

These farms produce a tremendous amount of manure. And they aren’t the only animal operations in that area. I realize that manure management plans are required, but again; this is a lot of manure concentrated in a relatively small geographic area. And it’s an area that impinges on the wellhead protection areas of several small communities.

Groundwater doesn’t recognize property or township boundaries, particularly in this karst region. I think there is a real risk of irreparable contamination of groundwater by the cumulative effect of all these livestock operations. Daley’s expansion and number of animals being far and away the largest, well beyond the current county animal unit cap.

Groundwater belongs to everyone, and I believe it would be irresponsible not to require an Environmental Impact Statement regarding this application.

Thank you for your consideration.

Cherie Hales
Wiscoy Township
Winona County
Dear Ms Grosenheider:

It only makes sense to thoroughly understand the environmental impact of a farm of this size. I won't go into the moral aspect of these farms. It would be lovely to see your organization work with the area to determine whether the financial benefit to big ag outweighs the certain environmental harm to this area. A reasonable cost-benefit analysis couldn't hurt.

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Sincerely,

Melissa Maher
6462 Fawn Ln
Circle Pines, MN 55014
194 I am supportive of this farm expansion in these programs. We know this farm to manage its land and livestock with professionalism and great care. It’s staff and owners are extremely concerned with animal welfare and proper care. I support any effort the farm wants to make in expanding their business and holdings. Thank you.

195 Having done business with Daley Farms for many years, the Daley Family have been great to work with for over 20 years. Daley’s have invested their time and efforts to be good stewards of the land and implement agronomic practices that benefit their farming operation, the farm families that live next to them. Daley Farms have my full confidence and support.

196 I am in support of the Daley Farm Expansion. This is a great family business that uses good practices. I'm excited for this project to get approved and see the progress it brings to southern Minnesota.

197 I fully support Daley Farms Lewiston in their expansion plans. They are, and have been, very very conscientious dairy family farm. Their proposal to expand is important for their generations of family to succeed in the dairy market. I have full confidence, and all farmers I have discussed this with, express full confidence they will do awesome with regard to the environmental responsibilities with this feedlot expansion.

198 The Daley Farms near Lewiston is a family, yes family of generations of bringing quality Herdsmanship and dedication to the dairy industry of MN. The whole family has continually abided by local and state regulations. Their request to expand their feedlot is necessary as they come upon the next generation in their families who are ready to help more. It’s imperative that we look at where and what our young farmers want to do. Many of our young farmers have first gone off to college and have been taught the strict rules, laws, and regulations needed to increase farm management. Sales youth have pursued higher education and are now ready to grow the family business. They are conservationist and care for the environment is evident as soon as you turn in the driveway. Approval of permitting for Daley Farms expansion should happen swiftly so the future of this great family run farm can remain a pillar of the Lewiston community for generations to come. The economic impact to the surrounding communities is positively impacted by means that can’t be quantified. I personally call on Daley Farms and when I do, local businesses are benefitted by my spending. The Daley Family are experts at getting agriculture salesman to buy them lunch while talking about business transactions! This is just the tip of the iceberg for I am just one of hundreds of people that is part of this great farming operation. Thank you for your consideration, Kevin Schmitz Sparta WI

199 Having been in the agricultural inputs business for 20 years, it is of great pride that I do business with Daley Farms. This family run farm is one of the most professional and well kept farms in the tri-state area. Their attention to detail and care for the environment is evident as soon as you turn in the driveway. Approval of permitting for Daley Farms expansion should happen swiftly so the future of this great family run farm can remain a pillar of the Lewiston community for generations to come. The economic impact to the surrounding communities is positively impacted by means that can’t be quantified. I personally call on Daley Farms and when I do, local businesses are benefitted by my spending. The Daley Family are experts at getting agriculture salesman to buy them lunch while talking about business transactions! This is just the tip of the iceberg for I am just one of hundreds of people that is part of this great farming operation. Thank you for your consideration, Kevin Schmitz Sparta WI

200 We support the Daley Farm expansion plan. We trust that this family will do the right thing concerning environmental issues, such as groundwater contamination. We believe that they are using the latest information and farming practices that will help sustain land and water quality surrounding their farm. We own and operate a livestock feeding facility and know that preserving the environment is essential for future generations in farming. We also know how difficult it is for the next generations to continue on family farms. We applaud their efforts in wanting to pass along the value of good farming practices to the next generation of Daleys.

201 I am a long time supporter of Daley Farms and when I do, local businesses are benefitted by my spending. The Daley Family are experts at getting agriculture salesman to buy them lunch while talking about business transactions! This is just the tip of the iceberg for I am just one of hundreds of people that is part of this great farming operation. Thank you for your consideration, Kevin Schmitz Sparta WI

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207 I’m an organic farmer less than 5 miles away from Daley Farms and I support the permitting of Daley Farms to expand. I believe they will bring greater economic prosperity to the area and will allow for expanded markets for local farmers commodities! Plus I would be willing to aid them in their manure disposal on our land! To whom it may concern farms like the Daley’s will be the farms of the future in Dairy and if we want to see a better family to expand to the size they are seeking and I wish them well.

198 I am a former resident of Lewiston Minnesota and I support Daley Farms of Lewiston. This family farm has done nothing but good for the community. When I was going through Elementary and Intermediate (5-6th grade) school, they paid for the milk we got during our milk/snack break, helping families save some money for other expenses. This is just one of many things the farm has done for the community. The Daley Farm also isn’t a business that hides or cuts corners with issues. The entire family works tirelessly to make sure their farm expands expectations with the community. Not only that, but they encourage people to come tour the farm who are curious, skeptical, or just willing to learn about the dairy industry. They also have a Facebook page that shows how they treat their dairy cows making them very transparent with their operations. Ever since they wanted to expand, members of the farm have been working with the state and local community to make sure that everything is up to par, and to make sure that the entire city of Lewiston receives little to no negative impact that could potentially arise with such a big expansion. This family has done everything they can for this community. They are kind and easy to work with. I strongly ask for your support of this family dairy farm endeavors. Sincerely
Daley Farms has been a fixture in the Lewiston community for nearly 160 years. Their philanthropy and strong support of our community will continue to help Lewiston thrive. They have become the gold standard among our area farms when it comes to sustainability and conservation practices. Whether it be sand reclamation or a diverse mixture of cover crops, DFLLLP are great stewards of the land. With this expansion, I can only see their land stewardship practices having a stronger impact on decreasing nutrient runoff and slowing soil erosion. So many farmers in our area commit to the typical corn/soybean rotation and in the non-growing season that land is left barren, subject to wind and water erosion. Daley Farms on the other hand grows mostly alfalfa. Alfalfa keeps the soil covered year round and, from what I'm told, their corn silage fields get planted to a diverse cover crop mixture once harvested. That keeps the vast majority of their fields covered year round and reclaiming nutrients deeper in the soil horizon. If the expansion were to go through, more Winona county farmland acres would be mitigating the effects of nutrient runoff, which is a serious issue in our county and neighboring counties as well. I've gotten to know the next generation considerably well and they are continually searching for new ways to maximize their operations sustainability and minimizing their environmental impact. Their passion for their family farm is strong! Finally, in a town that has turned in to more of a bedroom town than a town with strong job opportunities, DFLLLP's expansion would provide additional jobs opportunities to a town that is in need.

Daley Farms of Lewiston is the cleanest and most organized family farm I have seen. Over a two year span through a college program, I have visited over 50 dairy operations, both small family farms and large operations up to 10,000 cows. Daley farms has the most well maintained buildings and equipment for their age. Their management practices from animal to field are consumer and environmentally minded, and from visiting the farm I could see they make sure these practices are followed all the time. For a dairy this size you really can't find any other that are run almost entirely by close family. Daley Farms have a look a large dairy but when you visit with them it feels like a small family farm. If given the opportunity to grow there is no doubt this family farm will and can make a family farm is always one that stood out in going over and beyond in implementing new technologies, being open to change, and always having a positive attitude. While the struggle to remain involved in the family farm. Historically the Daley family has been actively involved in agriculture in Winona County for many generations. As they look to expand their land stewardship practices having a stronger impact on decreasing nutrient runoff and slowing soil erosion. So many farmers in our area commit to the typical corn/soybean rotation and in the non-growing season that land is left barren, subject to wind and water erosion. Daley Farms on the other hand grows mostly alfalfa. Alfalfa keeps the soil covered year round and, from what I'm told, their corn silage fields get planted to a diverse cover crop mixture once harvested. That keeps the vast majority of their fields covered year round and reclaiming nutrients deeper in the soil horizon. If the expansion were to go through, more Winona county farmland acres would be mitigating the effects of nutrient runoff, which is a serious issue in our county and neighboring counties as well. I've gotten to know the next generation considerably well and they are continually searching for new ways to maximize their operations sustainability and minimizing their environmental impact. Their passion for their family farm is strong! Finally, in a town that has turned in to more of a bedroom town than a town with strong job opportunities, DFLLLP's expansion would provide additional jobs opportunities to a town that is in need.

The Daley Family have been actively involved in agriculture in Winona County for many generations. As they look to expand, they have been thorough in their research and planning in order to meet the regulations as well as the concerns of the general public. I fully support the Daley family in their desire and plan to expand their farming operation to meet the needs of supporting the next generation of Dales.

I was able to tour the current dairy twice through different school functions, and I was able to get to know the family better while attending college with a member of the next generation. To me, it is obvious this family cares about more than themselves and have shown it by opening their doors for educational purposes like the experiences I had. They have made an effort to maintain environmental and economical stability and I believe they are capable of maintaining them through the proposed expansion. Families like this are a great face for agriculture and ones I hope will be around for a long time.

The Daley Family farm is a big asset to the Lewiston community. The farm brings business into the community. They also hire out work done on the farmer through members of the Lewiston community. They are very conscientious of what goes on in the community. Daley Farms has been open their doors for educational purposes like the experiences I had. They have made an effort to maintain environmental and economical stability and I believe they are capable of maintaining them through the proposed expansion. Families like this are a great face for agriculture and ones I hope will be around for a long time.

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We support the Daley Farm expansion. Our family owns and operates a 225 cow dairy farm, just a couple of miles from the Daley Farm. As a neighboring farmer, we have witnessed their innovation and dedication throughout the years to ensure the best solutions for the environment. We support them and this expansion and have no concerns with their plans for expansion.

The Daley Farm is a very professional and very clean run dairy farm I take tours of these farms and I'm very impressed with the professional and quality of work they do. The Daley family take care of their live stock as if they are Humans.I would recommend the Daley farm to anyone for employment or service.

I have worked for Daley Farms for more than 30 years as a member of the Lewiston Veterinary Clinic and through my present business CalStar LLC. I was working and living in the area prior to and since Daley Farm LLP was started and the present dairy built. I would like to make multiple comments on the Daley operation from my observance from the farm and as a member of the community. Since its inception I have always been impressed by the owners of the operation and their attention to detail. The values, protocols and practices at the dairy are of some of the best in the industry. I travel throughout the county on many large dairies, some in excess of 30,000 cows on one site and the methods used by the Daley Farm owners for animal husbandry, manure management and most important, employee retention and attitudes are at a very high standard. I would like to highly support the request for Daley Farms to be granted the permits to expand their operation. Thank you Robert J Schell DVM CalStar LLC DrBob@CalStar.com

Daley Farms - phenomenal farm and even more phenomenal family. No one puts more love, care, and thought into their farm and animals than the Daley's. Proud to have them as a local area business and proud to support all dairy. They are an incredible asset to the surrounding communities; very excited to see them expand for generations to come.
Good afternoon, I am in favor of the full environmental review of the proposed Daley Mega Dairy. It is too large and too delve in an area of the state to take chances. When something happens wrong and, with the human condition, something always goes wrong. I live about 1 - 2 miles from the farm in Lewiston. The Daleys have always been good neighbors, but to allow this with out the full environmental review would be foolish. Below is a letter to the Winona Daily News, printed Oct 10, 2018. It is by Barbara Wold, Lewiston, MN. I think it describes my thoughts on this subject very well. Thank you - Jim Ziegler.

The Daley farm on Hwy. 14 in Ullica Township near Lewiston wants to expand their 1,600 cow mega-dairy to 4,600 cows. This would make it one of the 10 largest dairy farms in the state. All other dairies of this size are in western Minnesota. It will generate 46 million gallons of liquid manure and wastewater in a year. This is in our high risk karst area. It would use 92 million gallons of water a year. For sure this will have a significant impact on our Winona County environment. Right now, the Minnesota Pollution Control Agency has started the mandatory basic environmental assessment of the project called an Environmental Assessment Worksheet. (EAW). The purpose of this is to determine whether an in-depth Environmental Impact Statement is needed. It is this EIS that deeply evaluates the potential harm and looks at ways to reduce that harm. The law says clearly if a project "has the potential for significant environmental impact" then an EIS is required. Of course, a-dairy-size this in a high risk karst area where groundwater is already polluted will have a significant impact. We should all remember that due to sinkholes, Lewiston's municipal sewage lagoons collapsed in 1992. Two other municipal sewage lagoons in the area have also collapsed — Altura in 1976 and Bellchester in 1992. The Daleys are adding a 13.6-million-gallon liquid manure storage basin. They already have four that can store 22 million gallons. So in that one small area will be stored up to 35.6 million gallons of raw liquid manure. What if a sinkhole opens beneath one of them? That means millions of gallons of liquid manure flowing into our groundwater. Also, these manure lagoons allow for seepage. What is the impact of that on our drinking water? This also means 35.6 million gallons of raw liquid manure must be spread every year in the area. What will that impact be on water quality? The MPCA makes the final decision on doing an EIS unless the Daleys do the right thing and volunteer for one. For sure, without an EIS we won't get a full analysis of the harm and how it might be avoided. Right now, the MPCA is taking comments on the environmental worksheet here: bit.ly/daley_comment. There is a limit to how big you can get before you start impacting everybody's air, water, and quality of life. We need an in-depth Environmental Impact Statement to look into that. An EIS just makes sense.

Daley Farms has been a contributing member of the community for a few decades. They take good care of their animals, they run an impeccable clean operation, they are courteous to all and support the community through many donations. Not only is this expansion well deserved it will ensure Lewiston and the surrounding communities will be sound economically for many years to come.

We have been neighbors to Daley Farms, Inc for many years. They have proven to be responsible caretakers of both their livestock and the environment. They are involved in the local community and support the greater good of all members in the Lewiston area.

Growing up in Lewiston, Daley Farms, Inc. has always been on the horizon. Always clean, always neat. Always striving to make the cattle they raise clean and comfortable to reach their full production. Great family! Great farm! Great for Lewiston!
Good morning, I am in favor of the full environmental review of the proposed Daley Mega Dairy. It is too large and in too delicate of an area of the state to take chances. What happens when something goes wrong? In the human condition, something always goes wrong. There is also the idea of ground cover crops and other mitigating methods for keeping ground water safe. What is the guarantee that this will continue? What happens when economics overruns the good neighbor concept? This may happen in 50-20 years, who knows who will be in control of this factory by then about 1 - 2 miles from the farm in Lewiston. I have had the opportunity to drive by a letter to the Winona Daily News, printed Oct 10, 18. I think Nelson of Lewiston, MN. I think it describes my thoughts on this subject very well Thank you - Kay Ziegler The Daley farm on Hwy. 14 in Utica Township near Lewiston wants to expand their 1,600 cow mega dairy to 4,600 cows. This would make it one of the 10 largest dairy farms in the state. All the other dairies of this size are in western Minnesota. It will generate 46 million gallons of liquid manure and wastewater a year in their high-risk karst area. It would use 92 million gallons of water a year. For sure this will have a significant impact on our Winona County environment. Right now, the Minnesota Pollution Control Agency has started the mandatory basic environmental assessment of the project called an Environmental Assessment Worksheet (Editor's note: You can read the worksheet at bit.ly/Daley farms). The purpose of this is to determine whether to have an in-depth Environmental Impact Statement is needed. It is this EIS that deeply evaluates the potential harm and looks at ways to reduce the harm. The law says clearly if a project has the potential for significant environmental impact” then an EIS is required. Of course, a mega-dairy this size in a high risk karst area where groundwater is already polluted will have a significant impact. The Daley’s does not remove all over the roads, dairy farm has been here for more than 100 years. In 1992, The Daley's are adding a 13.6-million-gallon liquid manure storage basin. They already have four that can store 22 million gallons. So in that one small area will be stored up to 35.6 million gallons of liquid manure. What if a sinkhole opens beneath one of them? That means millions of gallons of liquid manure flowing into our groundwater. Also, these manure lagoons allow for seepage. What is the impact of that on our drinking water? This also means 35.6 million gallons of raw liquid manure must be spread every year in the area. What will that impact be on water quality? The MPCA makes the final decision on whether an EIS is needed or if it should go no further. The Daley’s right thing and go figure. For me to get a full review of the harm and how it might be avoided. Right now, the MPCA is taking comments on the environmental worksheet here: bit.ly/Daley_comment. There is a limit to how big you can get before you start impacting everybody’s air, water, and quality of life. We need an in-depth Environmental Impact Statement to look into that. An EIS just makes sense.

Great luck to the Daley Family this coming week. Daley farms have been a model of both animal husbandry & stewards of the land, it’s time for them to be there to work with other land owners/ farmers in the challenge & this farm is not going to be a threat to the environment. The Daley's have such a positive outlook for the Dairy industry. South East MN needs Dairy companies and growth. We need to support growth in MN, in this industry.

In these difficult times for dairy farmers it is refreshing to see the Daley family and 5 young adults willing to invest in a future dairy. This is not a bunch of suits from the big city wanting an investment, these are people who live here, raise their children here, send their kids to our schools and support many, many local causes and businesses. The Daleys have been here for more than 100 years, they are committed to preserving the land they farm, caring and loving their animals and doing it in an economic, efficient manner. They follow every guideline put forth by the state when applying the nutrient rich manure back on the land. They do not get too many tons of manure to be spread over the fields, dairy farm has been here for more than 100 years. All the family members live on farm properties and drink from the wells on their properties. Polluting the ground water or streams around them is the last thing they want to happen and will take all the necessary steps needed to prevent it from happening in my view.

I would like to comment on the proposed expansion of Daley Farms of Lewiston. I have worked in the Winona County area for 35 years and I have always heard very positive comments about the Daley’s. I have personally worked with the Daley’s since the mid 90’s on a professional basis. The Daley’s have always done an excellent job of managing their farm and have always tried to do the right thing. I worked with the Daley’s when they expanded in 1997-1998 as they went from around 300 cows to 1500 cows. That expansion went very well and I feel that the Daley’s will do an excellent job of moving from their present size to 3000 cows. I strongly recommend to the MPCA that their expansion be approved.

I am writing in support of the Daley Farm of Lewiston’s plan of expansion. Opportunity doesn’t strike at everyone’s door to enter the family business, but farming is one of those industries that allows for new beginnings for younger people to become involved in. This energetic, technology-loving, motivated, and hard-working group of young adults is ready to take on and join the family dairy. I witnessed them working side by side with the rest of the family and employees daily cleaning practices and bringing new ideas to the table. Furthermore, they focus on the public with social media by posting new updates with the family farm and footage of various aspects for everyone to enjoy and learn from. If I would encourage everyone to visit their Facebook and Twitter accounts to experience this. I fully support Sidney, Dustin, Dylan, Gabe, Dominic and the rest of their family in the plans of expansion.

Daley Farm does a great job of taking care of the land it is nice to see a family farm take such an interest in Agriculture with the challenging years that the farmers have been going through. The Dairy farm around us are declining at a rapid pace because of the challenging times with these extremely low milk prices. I believe by keeping the dairy cow numbers up in south east Mn is a great thing. Alfalfa and grass with the dairy cows eat helps control erosion on the hills instead of the corn and beans row crops that you get more erosion with so keeping the dairy cows numbers up is a win for Winona County. Financially it make more since to have a large number of cattle in one site. They don’t regulate how many cars the car dealers can sell in Winona County I feel as long as they meet the requirements that the MPCA Daleys should be able to have the dairy animals they need to make the family operation financially work for them. There is so much negative emotions in the Agriculture industry around its nice to see the Daleys have such a positive outlook for the Dairy industry, South East MN needs Dairy cow numbers up.
237 Daley Farms of Lewiston have their support to expand their dairy operation, all rules and regulations must be followed in the past and in preparation for this dairy expansion. This family farm deserves the chance to continue operating and business structure serves as a model to all of agriculture. It supports several families currently and this number will continue to grow as the next generation enters the business. Daley Farms is a positive example to other businesses on how to take care of the environment. It controls any runoff that could pollute local streams and rivers. It stores manure in safe facilities to prevent surface and ground water contamination. It recycles whenever possible. Daley Farms shows that successful and profitable dairy farms can also be good stewards of the environment.

238 I grew up with mixed feelings of any dairy with size as I used to dairy myself with a max of 130 lactating cows. Since I’ve had the opportunity to travel and see or work at many sizable farms and am nothing but impressed with what I’ve learned. I honestly am more apt to want food on my plate from these farms because of the strict quality control standards and protocols put in place. With that said the rules and regulations the county, state and federal levels enforce on these farms do work and ensure high quality product, excellent land stewardship practices, and a healthy and comfortable environment for both the animal and worker. The particular business and family farm, Daley Farms of Lewiston, is ranked right at the top of my list of many sustainable, environmentally friendly, cow friendly (yes there are happy cows in MN!) operations throughout the United States. I definitely support the decision for them to grow to support their business and family farm. A side note rant... when I speak of regulations, I feel there could be more law enforcement on some of these farms (the above mentioned certainly not included) and unfortunately when I state this it most certainly pertains to smaller, older farms, not so cow friendly farms. When I walk in a barn with 30 cats (literally I’ve counted on a dairy in Goodhue county) running around, cat shit in the milk room, and the smell of cat shit overpowering the smell of cow shit... that’s the farm that needs to go. Sorry, the days of y’all setting regulations but not enforcing gotta be over from the county up to the USDA. I could take y’all to visit that farm if you want me to I’m sure it hasn’t changed.

241 I am writing in support of Daley Farms of Lewiston Dairy Expansion. As a consultant to the upper Midwest dairy industry, I find that this family dairy is one of the best managed dairies in the upper Midwest. Its operating and business structure serves as a model to all of agriculture. It supports several families currently and this number will continue to grow as the next generation enters the business. Daley Farms is a positive example to other businesses on how to take care of the environment. It controls any runoff that could pollute local streams and rivers. It stores manure in safe facilities to prevent surface and ground water contamination. It recycles whenever possible. Daley Farms shows that successful and profitable dairy farms can also be good stewards of the environment.

242 I have worked with Daley Farms of Lewiston for over 2 years. Mainly dealing with their bull calves and in all my dealings with them they have professional, honest and respectable. Their operation seems to be clean and organized. As far as the calves they have always been clean and have always treated them in a humane manner.

243 This project poses a real threat to the health of aquatic ecosystems in the watershed. CAFO’s because they concentrate waste from so many animals are inherently risky. Time and time again these manure lagoons leak and spill and release animal waste into our rivers and streams destroying aquatic life and harming human health. These projects are particularly risky in areas like SE MN where there is a lot of topography and karst geology such that spills can easily run directly into streams or sink into ground water. This is simply the wrong place for a CAFO as proposed.

244 I have concerns regarding an increase in the Daley Farm Feed Lot. As someone who is a frequent user and advocate for our state parks, streams and rivers I am worried that this poses a risk to streams and other natural resources in the area. Water from Lewiston flows downstream to Garvin Brook and other surrounding streams and waterways. I have concerns that disposing of the amount of water generated by such an increase would affect water quality in the area. At Minimum an environmental impact review should be completed.

245 Daley Farms has a great family who care about their community. They have taken care of our precious natural resources and I don’t see any issue with their expansion.
have is how many dairy cows are there today compared to five years ago? Dairy industry has had a hard go of it the past 4 years. There are farmers selling their herd every month, how many of those cattle are being replaced by expansion of other operations? I don't have the numbers and I may be wrong but I'd be willing to bet there are less dairy cattle in Winona County today than there was 5 years ago. This is getting quite worrying but I am sure in full support of them being allowed to increase their operation to whatever they are requesting for. So thesilentI am not a farmer nor do I work in that ag industry, I do however understand and that the ag industry is very good for the economy all over the Mid West and keeps many other businesses, schools, and families thriving. thank you for your time. Cameron Kennedy

Lifetine Vermont Township resident and fanatical trout fisherman.

249 I am writing to voice my concern about the Daley farm proposal that I oppose. I have 2 siblings and grew up on a 400 acre farm with a small feedlot and also worked on what was the largest farm in Trempeleau County, Wi. That family had 6 siblings. My father's family had 5 siblings and a dairy farm. My numerous cousins who grew up on farms had multiple siblings. There are other options for the Daley family to keep the farm there is the tradition and tradition. Far exceeding the county limit does not have to be the only or even the best way to do things. It is difficult to discuss the Daley family's project within the unit, but that is part of farming. It seems this family is trying to convince the public that this is their only option, but it is clearly not. This does not appear to be a farm that is struggling. I know things are not good for dairy right now but just looking into how much the Dales have received in subsidies since the mid 90's can tell you a lot: $5,300,000 (EWG farm subsidy database). They also have 1600 acres of prime Winona County land. Many citizens would envy the situation the family is in. Nobody certainly needs to feel sorry for them. It is not easy to figure out how to pass on that kind of estate but that is a good problem to have. They are able to receive the financing to complete their project. I am concerned with this project is environmental. With the number of feedlots already in that vicinity of our county and the number of wells already protecting safe levels containing contaminants this project would be unwise to say the least. I know a few people say they support it and others are staying quiet but it is very difficult in a community like Lewiston's size to stand up to this kind of thing when the family has so much clout. No farm big or small can plan for the kind of rain events we have been having. These type of manure lagoons were designed for 25 year rain events. We have those back-to-back to 100 year events are starting to feel like almost annual events. Just a few years back we had a lagoon spill in Canton (Filmore County) of a million gallons that went right into a trout stream. The herd size was 400 I believe. This is massive compared to that and the Whitewater watershed. This farm drains to a lot of public land. I know from experience that even with careful planning bad stuff can happen with manure lagoons and the spreading of liquid manure. If lagoons are getting near capacity and fields are too wet to spread manure what happens when that 25 year or 50 year or 100 year or 1000 year rain event happens. Overflows, I have seen it more than once. What happens when the lagoon is full and the fields are dry but the forecast is for loads of rain? Spread as much as you can as soon as you can so the lagoon doesn't overflow. Then the rain event washes much of the manure into nearby streams. I have seen it too many times. I am sure the Daley Family will try to do their best to prevent this sort of thing. I believe them. You just cannot plan for these sort of things and they will happen. The environmental impact of these sort of mega farms can be looked at several ways. Locally we have Whitewater State Park and the 1000's of acres of public land surrounding it. I would be curious to know what the economic impact of those streams are on the local economy. We are known for great trout fishing. Antibiotics and growth hormones survive in manure lagoons for up to 270 days. Studies show that the affect the reproduction of fish downstream. I would think they also affect amphibians and possibly even aquatic insects. That is not okay with a lot of the public who care about these things. These things might not affect the Dales but that is because they are on the upstream end of all this. Everything from their farm flows downstream. On a larger scale, this kind of unsustainable agriculture adds to the problem of the Mississippi river basin. The dead zone and red algae blooms in the Gulf of Mexico are directly related to these kind of farms. This might not concern certain people this upstream but if you made your living in Louisiana or Alabama related to those waters it would. In Kewaunee County, Wisconsin, you can see Winona's future if the Daley family was allowed to move forward. The Kinnard farm sits over karst topography and has moved from 4000 milk cows to 6000. The family said they had science on their side, a good business plan, that they were good neighbors and it was nothing they couldn't handle. A majority of the surrounding wells in the township exceed safe bacteria and nitrate levels. Neighbors also said they were unprepared for the amount of truck traffic a mega-dairy would bring and the ammonia in the wind. Here is language from that county (Town of Lincoln 2016 Supplement to Kewaunee County 2006 Comprehensive Plan) “One particular downside to the dairy CAFOs in the Lincoln Township and the county. Many residents are hoping for alternatives.” The Daley farm spreads from Lewiston towards Utica. I am not a member of Trout Unlimited but I would still like to know I can take my future grandkids trout fishing in the Whitewater watershed someday. Heck, I’d enjoy catching frogs and looking for salamanders just as much. As I drink right out of the springs that fed our little stream. My parents didn’t have a lot of science to use but they did have common sense to know how many animals were actually good for the land. A majority of the surrounding wells in the township exceed safe bacteria and nitrate levels. Neighbors also said they were unprepared for the amount of truck traffic a mega-dairy would bring 1,500-animal unit cap at the time the ordinance was adopted and so was “grandfathered in.” This means it could continue but could not expand (increase its non-conformity). Thank you for considering our concerns.

250 Winona County has a very fragile Karst topography. Every feedlot affects this and our water. Please do not allow any more feedlots or expansions in Winona County. Thank you.

251 Mississippi Market is a member owned natural foods cooperative in St. Paul MN. We have been in operation for 80 years. We are also a part of the Wisconsin Farmers Union. We work with local farmers to help them produce food that is sustainable showing respect for the planet. We would like to go on record as being against approval for the Daley farm expansion. We hope you will consider that: • The project would annually use 92 million gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 million gallons of water per year. What impact will this major use of water have on our aquifer? • From the EAW: “Daley received DNR’s preliminary approval letter to construct the new wells for the Project on October 30, 2017 (Attachment R). The DNR has stated in the preliminary approval letter, that DNR has ‘determined that the proposed rate and volume of withdrawals at the site will not cause adverse effects to water wells, springs or other water uses or have the effect of pum...” • The proposal will annually produce 150 million gallons of manure and wastewater in an area where karst geology channels contaminants from surface water deep into the ground. • Lewiston’s municipal sewage lagoon disappeared into a sinkhole! What if one of the multi-million gallon lagoons at this project doesn’t collapse into a sinkhole! The municipal lagoon in Altura fell due to a sinkhole in 1976. The sinkhole that appeared in Belferich in 1992. Well testing conducted in 1992 at the Goreville location exceeded the safe drinking water standard for nitrates. According to the USDA Natural Resources Conservation Service, 250 cows produce as much nitrate/nitrogen as 5,000 people. By that count, the 4,600-cow Daley Dairy would convert naturally into nitrate/nitrogen as a town of 90,000 people. Citation: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211 • The proposed manure basin would have a surface area equal to 3.3 football fields – and it’s designed to be 16-feet deep. • Winona County’s ordinance is clear: feedlot operators are allowed over 5,000 animal units. This animal unit cap was passed in 1979. The project applicant acknowledges that this puts the project outside the scope of the ordinance. The proposed manure basin would be over 1,500-animal unit cap at the time the ordinance was adopted and so was ”grandfathered in.” This means it could continue but could not expand (increase its non-conformity). Thank you for considering our point of view in this matter.

252 Please require an extensive Environmental Impact Statement on the expansion of the Daley Farms, Lewiston, MN. The geography of this region, and past history of City Lagoon failures in Lewiston, and Altura shows us how to structure approach to water quality management and expansion of the MPD farm. The U.S. Environmental Protection Agency (EPA) has required all livestock operations of over 1,000 animal units to develop a National Pollution Prevention and Abatement Plan (NPPAP). The average animal unit has been defined as 1,500-animal unit cap at the time the ordinance was adopted and so was ”grandfathered in.” This means it could continue but could not expand (increase its non-conformity). Thank you for considering our point of view in this matter.
reality that, in karst country, there is a limit to how many animals you can pack into one location when you are storing liquid manure in lagoons. The Daleys’ farm was over the 1,500-animal unit cap at the time.

The proposed manure basin would have a surface area equal to 3.3 football fields – and it’s designed to be 16-feet deep. Why is the MPCA doing an EAW on the Daleys’ proposed massive expansion when it is not allowed under our Winona County Ordinances? Winona County’s ordinance is clear: no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. This cap acknowledges the reality that, in karst country, there is a limit to how many animals you can pack into one location when you are storing liquid manure in lagoons. The Daley farm was over the 1,500-animal unit cap at the time the ordinance was adopted and so was “grandfathered in.” This means it could continue but could not expand (increase its non-conformity). Why don’t the rules apply to everyone equally?

I think the mega farms have no place to go but out of sight in a water table. The cackle could be milked 24/7 which means noise and smells for nearby homes and business. I disagree of mega farms.

What would happen to our aquifer if the proposed manure pit with a surface area of three football fields, and 16 feet deep, would disappear into a sinkhole? An extensive environmental impact statement says “may interfere with other water uses or have negative impact on nearby lakes, streams or wetlands.” Indeed it may since the farms will eventually produce 46 million gallons of manure and wastewater annually. Why don’t the rules apply to everyone equally?

To whom it may concern: This project will use millions of gallons of water which will inevitably be a problem for the city. And millions of gallons of manure will eventually contaminate the aquifer. Please do not allow it. Thank you for the opportunity to comment. Joan Meierotto

Winona County has established a feedlot animal limit for a variety of reasons. This application for a feedlot that greatly exceeds such standards indicates that it is not to be considered at all, then it is imperative that an environmental impact statement be produced. MPCA should consider requiring municipal-grade waste treatment for such large amounts of sewage, and also alternatives such as anaerobic digestion.

The project would annually use 92 million gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 million gallons of water per year. What impact will this major use of water have on our aquifer? From the EAW: “Daley received DNR’s preliminary approval letter to construct the new wells for the Project on October 30, 2017 (Attachment R). The DNR has stated in the preliminary approval letter, that DNR has ‘determined that the proposed rate and volume may interfere with other water uses or have negative impact on nearby lakes, streams or wetlands.’ ” In time it will be a massive public expense and revulsion. Individual profits may result from what in time will be a massive public expense and revulsion. Individual profitability may result from what in time will be a massive public expense and revulsion.

The EPA wants to be an environmental impact assessment to look at the risk of manure run-off into the already polluted Mississippi watershed. From what I have read, it is illegal in Winona county to have more than 10,000 cows in an area where karst geology channels contaminants from surface water deep into the ground. Lewiston’s municipal sewage lagoon disappeared into a sinkhole in 1991. What if one of the multi-million gallon lagoons at this project disappears into a sinkhole? The municipal lagoon in Alturta failed due to a sinkhole in 1976. The same thing happened in Bellechester in 1992. Well testing conducted by the Minnesota Department of Agriculture in 2016 showed that 46.3 percent of the wells tested in Utica Township exceeded the safe drinking water standard for nitrate/nitrogen by 15 percent. According to the USDA Natural Resources Conservation Service, 250 cows produce as much nitrate/nitrogen as 5,000 people. By that count, the 4,628-cow Daley Dairy would conservatively produce as much nitrate/nitrogen as a town of 90,000 people. Citation: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/north dakota/?cid=nrcs143_014211 Why is the MPCA doing an EAW on the Daleys’ proposed massive expansion when it is not allowed under our Winona County Ordinances? Winona County’s ordinance is clear: no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. This cap acknowledges the reality that, in karst country, there is a limit to how many animals you can pack into one location when you are storing liquid manure in lagoons. The Daley farm was over the 1,500-animal unit cap at the time the ordinance was adopted and so was “grandfathered in.” This means it could continue but could not expand (increase its non-conformity). Why don’t the rules apply to everyone equally?

I grew up on what was then considered to be a large dairy farm, 500-600 cows. The challenge of containing the waste product even in those unregulated times was enormous. I can’t think of one reason for approving the exception to the regulations their farm has already exceeded except that MPCA folks may be bribed.

Winona County exceeded the safe drinking water standard for nitrates. According to the USDA Natural Resources Conservation Service, 250 cows produce as much nitrate/nitrogen as 5,000 people. By that count, the 4,628-cow Daley Dairy would conservatively produce as much nitrate/nitrogen as a town of 90,000 people. Citation: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/north dakota/?cid=nrcs143_014211  Why is the MPCA doing an EAW on the Daleys’ proposed massive expansion when it is not allowed under our Winona County Ordinances? Why don’t the rules apply to everyone equally? Thank you.

I’m concerned about the proposed dairy expansion at the Daley Farms in Lewiston. I am an organic vegetable farmer in Stockholm, WI while I am not geographically close to the project, I still would like there to be an environmental impact assessment to look at the risk of manure run-off into the already polluted Mississippi watershed. From what I have read, it is illegal in Winona county to have more than 1,500 animals and I’m not sure why the project is being considered when they are proposing adding 2,900 animals to their existing operation. Thank you, Annie Nelson

We do not allow any feedlot exceeding the limits set by Winona County. The combination of Karst region characteristics and the global warming increase in extreme weather events makes it inevitable that catastrophic scoping will occur and poison the aquifer. Thanks.

I grew up on what was then considered to be a large dairy farm, 500-600 cows. The challenge of containing the waste product even in those unregulated times was enormous. I can’t think of one reason for approving the exception to the regulations their farm has already exceeded except that MPCA folks may be bribed.
I am concerned about water quality for Minnesotans across the state. The proposed expansion of the feedlot in Daley Farms holds great potential for endangering the water supplies of Lewiston and the surrounding region. Located in the (beautiful) karst country of Winona County, this farm would require far more water than the town of Lewiston and would produce massive amounts of manure that would be stored in giant lagoons - in an area prone to sinkholes and with faults that can carry contaminants deep into the ground. Such a mishap - all the more likely in this time of greatly increased heavy precipitation and climate change - could produce water supplies indefinitely. This situation must be stopped before it infects a million people, wildlife, and for Minnesotans - not only as we visit that region, but because we need the precedent of full examination of potential damages from such a project, no matter where it might be located.

I am writing in strong opposition to the expansion of the Daley Farms feedlot. This sensitive and beautiful area has had a history of sinking wells due to pollution from large sow operations which are already testing above a safe level for nitrates. This massive expansion is not allowed by county ordinances; even the current animal count is only allowed due to grandfathering the farm. The MPCA is supposed to be protecting the people and land of Minnesota not massive farm factories. At very least, a full Environmental Impact Statement should be completed, nothing less than an Environmental Assessment Worksheet.

Daley Farms of Lewiston and the Environmental Assessment Worksheet (EAW) which is part of the permit application approval process. Daley Farms wants to more than double its dairy herd from 1,728 cows and 6,628 calves to 4,628 cows. COMMENT: The known topography of the area is too porous to support any more animals than are already allowed under many county ordnances. This presents more risk to the surrounding community. The existing community should not have to compete with a commercial livestock operation for enough clean water. This proposal is already banned under the Winona County Ordinances. Local communities should not have to “hold their breath” living in proximity to the threats posed by a giant manure lagoon. This proposal is akin to expanding a city with no regard for householders, surface infrastructure, existing zoning laws or environmental impact. This expansion defies environmental safety logic and existing law. Below is background information from the Land Environm -

Protect the quality of Minnesota resources for future generations and prevent the expansion of the Daley Farms’ Cow production. The Earth doesn’t vote on when the land becomes toxic, it just becomes uninhabitable. At a time when your farm is allowed to live on it to show the route the runoff would take from the manure lagoon. Too much waste generation and the quality of life for the surrounding neighbors. The increase in anticipated nitrate levels is not healthy. Especially all the more likely in this time of greatly increased heavy precipitation.

To Whom It May Concern: Why is this Daley Farms expansion being considered? My main concern is for the watershed from that much waste being produced. Their placement is upstream of an extremely important watershed. As you can see in the attached maps, it is easy to see that excess nutrients, antibiotics, growth hormones, etc. will go down the full length of the Whitewater River. If anything were to ever go wrong with the increased manure storage the potential for health and living creatures die.

I am proceeding with an EAW on the Daley’s proposed massive expansion when it is not allowed under our Winona County Ordinances? Winona County’s ordinance is clear: no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. It acknowledges the reality that, in karst county, there is a limit to how many animals you can pack into one place when you are storing liquid manure unless you have a very limited and allow you to live in that world.

I am opposed to the Daley Farm exemption being considered. My main concern is for the watershed from that much waste being produced. Their placement is upstream of an extremely important watershed. As you can see in the attached maps, it is easy to see that excess nutrients, antibiotics, growth hormones, etc. will go down the full length of the Whitewater River. If anything were to ever go wrong with the increased manure storage the potential for health and living creatures die.

I am opposed to the Daley Farm exemption being considered. My main concern is for the watershed from that much waste being produced. Their placement is upstream of an extremely important watershed. As you can see in the attached maps, it is easy to see that excess nutrients, antibiotics, growth hormones, etc. will go down the full length of the Whitewater River. If anything were to ever go wrong with the increased manure storage the potential for health and living creatures die.

To Whom It May Concern: Why is this Daley Farms expansion being considered? My main concern is for the watershed from that much waste being produced. Their placement is upstream of an extremely important watershed. As you can see in the attached maps, it is easy to see that excess nutrients, antibiotics, growth hormones, etc. will go down the full length of the Whitewater River. If anything were to ever go wrong with the increased manure storage the potential for health and living creatures die.

Finally, why is the MPCA doing an EAW on the Daleys’ proposed massive expansion when it is not allowed under our Winona County Ordinances? Winona County’s ordinance is clear: no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. It acknowledges the reality that, in karst county, there is a limit to how many animals you can pack into one place when you are storing liquid manure unless you have a very limited and allow you to live in that world.

With all due respect, I believe the LAW concerning feedlot expansion must be followed by everyone: 1. The MPCA is doing an EAW on the Daley’s huge expansion when that is not allowed under Winona County ordinances. 2. Under the Winona County ordinances, NO feedlots are allowed over 1,500 animal units. Since it was “grandfathered in,” the Daley’s could keep on with their dairy operation BUT not expand. Why is there even a consideration of this expansion when two legal ordinances clearly stand firmly and rightfully in its way? Any dismissal of the word and meaning of these ordinances is an embarrassing and flagrant dismissal of law. Margaret Kilheen

Too much waste. We all know it. Common sense.

My comment is that we need an extensive environmental study, called an Environmental Impact Statement (EIS) to protect the environment, water quality and quantity, health and quality-of-life for everyone affected.

These are my concerns: First, the proposed project would annually use 92 million gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 million gallons of water per year. What impact will this major use of water have on our aquifer? Second, from the EAW: “During received DNR’s preliminary approval letter to construct the new wells for the Project on October 30, 2017 (Attachment R). The DNR has stated in the water is already testing above a safe level for nitrates. This massive expansion is not allowed by county ordinances; even the current animal count is only allowed due to grandfathering the farm. Daley Farms would conservatively produce as much nitrate/nitrogen as a town of 90,000 people. Citation: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/?cid=nrcs143_014211 Sixth, the proposed manure basin would have a surface area equal to 3.3 football fields – and it’s designed to be 16-feet deep. Why is the MPCA doing an EAW on the Daleys’ proposed massive expansion when it is not allowed under our Winona County Ordinances? Winona County’s ordinance is clear: no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. It acknowledges the reality that, in karst country, there is a limit to how many animals you can pack into one place when you are storing liquid manure unless you have a very limited and allow you to live in that world.

Please demonstrate that you are an independent government body and not the employee of Big Agriculture. They have enough power and money. You are there to represent the People of Minnesota. Do the right thing!
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Winona County Ordinances? Winona County’s ordinance is clear: no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. This cap acknowledges the reality that, in karst
country, there is a limit to how many animals you can pack into one location when you are storing liquid manure in lagoons.The Daleys' farm was over the 1,500-animal unit cap at the time the ordinance was
adopted and so was “grandfathered in.” This means it could continue but could not expand (increase its non-conformity).
I am writing to protest the proposed gigantic feedlot operation in Lewiston by the Daley farm. You are surely aware of two overriding facts about this proposal, either of which should be more than sufficient to
put the kabosh on this project. One is that the Karst geology of the area makes it a terrible risk for locating its huge manure holding pond, not to mention that the manure can't be applied to fields in this area for
the same reason of threat to ground waters. Secondly, Winona County does not allow feedlots over 1500 units, so why are you even considering an application for a project that is triple this amount? Times are
changing in respect to raising cattle, and this project is backward-looking. Cattle can be a major asset if they are raised in an environmentally sophisticated manner, protecting ground and surface waters,
sequestering carbon, creating healthy soils, etc. It's unfortunate that the Daley farm isn't headed in this direction, but in any event this proposal is clearly bad and should progress no further as it is Steve
Anthony, Minneapolis
I am writing in response to the Daley Farms proposed expansion for their dairy farm. I have several concerns about this proposal: 1. Lewiston has an ordinance limiting the number of animals allowed on a
farm. This ordinance was developed out of concern for the areas air, water, soil and people living there. What is the purpose of an ordinance if anyone can bypass it by getting a government agency to determine
the impact would not harm the area. I believe the ordinance needs to be followed. 2. The amount of waste produced by this expansion is a danger to the area. If a city had 4500 people a waste water treatment
plant would be required. A Cow produces much more waste than a person, yet no waste water treatment is required? A manure lagoon produces fumes affecting the air quality for all the residents living in the
proximity. Potential for breaches of the lagoon exists, which could contaminate all ground water and the aqua fir. 3. The amount of water required for this large number of farm animals would significantly affect
all other households in the area. The cities municipal water system and the individual rural households with private wells could lose their water source due to over use, pollution, reduction of the aqua fir supply.
4. The loss of suitable, safe water for the people living in this area would create financial hardship and destroy the local economy. Please consider the precedent being set if this entity is allowed to by pass the
ordinance. The families and businesses in Lewiston could lose their quality of life and community. Respectfully, Linda O'Neill DeRemee
To whom it may concern, I recognize that balancing the needs and interests of corporations with the health of our fine state's environment is a difficult job. It is gray, not black an white. With any development or
decided change, there are payoffs and impacts. I appreciate your willingness to do this difficult work. I urge and implore you to review the data and ensure that we aren't risking things that cannot be easily
acquired back. In the cases of the safety risks to water and manure contamination, a farm of this scale, the risks are too high. This is where citizens may pay the ultimate price for a decision made to allow
corporate interests to expand without absolute scrutiny to protect our communities and environmental systems. Money cannot buy these things back. Thank you, again, for your steadfast commitment to
protection of minnesotans and our natural environment systems. We put our trust in you to make the right decision. Kindly, Haley Stender
I oppose the expansion of the Daley Farms feedlot. I believe in a sustainable agriculture environment for Minnesota not one that harms the waters and pollutes the air. I also believe all people have a right to live
on their property in the state it was originally obtained. That is the views should be saved, the air should be as fresh as when it was obtained and the water as pure. The neighbors near to this farm certainly are
going to be adversely affected by an expansion. It is hard enough on them now. Please act under the governance of kindness to the land and the citizens of MN. Thank you in advance for making a step toward a
better environment for MN. Margaret Merkow
The cap on size of animal farms in Winona County was passed to protect the people and environment. Daley Farms in its current size already exceeds that limit. There is no good reason to further exceed the
limit as is being proposed. The risk of serious, long term, and possibly irreversible damage is too great. At a minimum, if this proposal is to be considered there needs to be an Environmental Impact Statement.
I oppose the expansion of Daley's Dairy herd. It would mean too many cows in one place. This would undoubtedly impact the precious karst groundwater aquifers negatively, to the detriment of future
generations.... Major sinkhole problems have led to sewage lagoons disappearing in this area in the past. The same could happen at Daley's, even without the enormous, unnecessary expansion. In addition:
Why is the MPCA doing an EAW on the Daleys' proposed massive expansion when it is not allowed under our Winona County Ordinances? Winona County’s ordinance is clear: no feedlots are allowed over 1,500
animal units. This animal unit cap was passed in 1998. This cap acknowledges the reality that, in karst country, there is a limit to how many animals you can pack into one location when you are storing liquid
manure in lagoons.The Daleys' farm was over the 1,500-animal unit cap at the time the ordinance was adopted and so was “grandfathered in.” This means it could continue but could not expand (increase its
non-conformity). Please block and revoke this attempt at expansion, as is necessary for the common good. Daley's already has too many cattle in this enterprise. In fact, already MORE cattle in this herd than the
Winona County Ordinance allows... Sincerely, Daniel Belgum-Blad Atwater, MN
I do not approve of the Daley Farms Dairy Expansion since it could cause serious pollution to the surrounding land and waters. I want to protect the people who live in this neighborhood, their children and pets,
the schools and all other projects.
There is no good reason to create a resource intensive factory farm at this time. Sustainable farming practices have been developed that produce more nutritious food. The sustainable practices require more
labor but less process inputs like water and feed. Large corporations should look at the sustainable farming industry as a way to differentiate themselves and create more Equitable food economies. I'm certain
this is stainable farming practices can be adopted by large corporations in a way that is more profitable than their current practices of resource intensive factory farming. The project would annually use 92
million gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 million gallons of water per year. What impact will this major use of water have on our aquifer? From the EAW: "Daley received DNR's
preliminary approval letter to construct the new wells for the Project on October 30, 2017 (Attachement R). The DNR has stated in the preliminary approval letter, that DNR has 'determined that the proposed
rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands.' Also, "The DNR's preliminary approval to construct a well is not an approval to use or pump
the well." The proposal will annually produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from surface water deep into the ground. Lewiston’s municipal
sewage lagoon disappeared into a sinkhole in 1991. What if one of the multi-million gallon lagoons at this project disappears into a sinkhole? The municipal lagoon in Altura failed due to a sinkhole in 1976. The
same thing happened in Bellechester in 1992. Well testing conducted by the Minnesota Department of Agriculture in 2016 showed that 46.3 percent of the wells tested in Utica Township exceeded the safe
drinking water standard for nitrates. According to the USDA Natural Resources Conservation Service, 250 cows produce as much nitrate/nitrogen as 5,000 people. By that count, the 4,628-cow Daley Dairy would
conservatively produce as much nitrate/nitrogen as a town of 90,000 people. Citation: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211 The proposed manure basin would have a
surface area equal to 3.3 football fields – and it’s designed to be 16-feet deep. Why is the MPCA doing an EAW on the Daleys' proposed massive expansion when it is not allowed under our Winona County
Ordinances? Winona County’s ordinance is clear: no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. This cap acknowledges the reality that, in karst country, there is a limit
to how many animals you can pack into one location when you are storing liquid manure in lagoons.The Daleys' farm was over the 1,500-animal unit cap at the time the ordinance was adopted and so was
“grandfathered in.” This means it could continue but could not expand (increase its non-conformity). Why don’t the rules apply to everyone equally
I would like to register my opposition to the proposed feedlot. We already have water quality issues in our county. Given the heavy rain events we have been experiencing, it isn’t possible to keep the
contaminated water from entering the surface waters and aquafir. Thank you for Ann opportunity to comment.
As the owner of a farm in Fillmore County, I am writing to express my confusion on why the MPCA would be considering the Daley's massive expansion when it is not allowed by Winona County Ordinances. The
ordinance passed in 1998 is clear that no feedlots over 1,500 animal units are allowed. The Daley farm was 'grandfathered in' to continue but could not expand. Great time and involvement was taken to pass the
1998 ordinance which looked to protect the Winona County environment for the future. Why would an exception to this ordinance be considered? It appears that the MPCA is allowing one family's economic
benefit to outweigh the health risks for the citizens of Winona County. This exception would then provide a precedent for other feedlots to expand where ordinances currently prohibit it. I urge you to stop this
expansion, conduct an impartial EIS and allow concerned MN citizens ample time to review and respond. Thank you for your thoughtful consideration and action. Sara Gjerdrum


Hello! As a resident and small-scale farmer in Southeastern Minnesota for over twenty years, I am concerned now more than ever about the sanctification of super-sized farming operations anywhere in Minnesota, but particularly in our fragile karst region. The Daley Farms Dairy proposal looking at more than doubling its size to nearly 5000 animal units, drawing yearly 92million gallons of water, more than three times the amount the entire city of St. Charles uses, will significantly impact our regional water supply, and waste produced by that number of animals kept in confinement will significantly impact local soil and water quality. In arguing this, I agree with the numbers and the model in the article of British’s The Ecologist “These numbers could point the environmental footprint of mega-dairy farming,” looks from the issue at many angles, finding concentration of cows can be beneficial in per-cow methane production rates, but finally concludes that ethics must be brought into consideration, that merely focusing on local viability and efficiency disregards the global impact of any new operation, saying “The biggest argument against large-scale dairying may end up being the unsustainable nature of the system, based on a high reliance on animal feeds, that it perpetuates, argues Tara Ganned. “However efficient your system is we cannot continue consuming as we do. The difference in GHG emissions and yield is not greater than the difference between keeping dairy levels globally as they are and then doubling by 2050. Any savings in efficiency will be outweighed by the sheer accelerated scale of production at a global level.’ Some suggest arguments over the environmental impact of dairying risk ignoring this bigger issue of consumption and how we rear livestock. ‘It’s tempting the gun to debate whether mega-dairy is efficient, before people have agreed whether it is fair and humane,’ says Food Ethics council director Tom MacMillan. ‘If ethical issues of farming meat and dairy are less appealing, then we need to eat less of their products. The answer cannot be more efficient. ‘We think this issue must be legislated in the House and Senate, for now an EIS would be the most fundamental way to thoroughly review the proposal. Please conduct a full EIS on the Daley Farms proposal.

I wish to express my deep concern against the Daley Farm expansion in Lewiston. As a Minnesota citizen and in particular my concern for the fragile karst region of the geology of the region I oppose this gross expansion of the Daley feedlot. The estimated annual use of 92 billion gallons of water(compared to the 33.5 billion gallons that the city of Lewiston uses is just outrageous and egregious to say the least. Great in this karst region of the region any contaminates of the karst geology tends to channel the contaminants straight to the surface water deep into the ground, which could cause damaging consequences to aquifers. Please consider the enormity of the manure basin that would be created, the size of 3.3 football fields and 16 feet deep. All of these things are deeply troubling and concerning! Certainly the air quality in the surrounding areas will also be affected by this large quantity of manure production. The final point is the fact that the Winona County Ordinance does not permit such a feedlot size with this many animals, it states that no feedlots are allowed over 1,500 animals. Daley’s existing farm and size (1,728 cows and calves) was ‘grandfathered’in when the animal unit cap was passed in 1998. Thank you for your consideration, Allan LaValier, fireduet@gmail.com, 651-351-0539 resident of Stillwater, MN.

Winona County’s Feedlot Ordinance prohibits feedlots with more than 1500 animal units. Since the farm was already larger when the ordinance was adopted, it was allowed to have up to that number. The current proposal goes far beyond that, making the environmental costs much much higher. Most importantly, liquid manure will be far worse than what the karst terrain can handle. Since the proposal is in clear violation of the ordinance, the state government should not allow the proposal to continue moving forward, as it did when it did an environmental assessment. The environmental assessment show that the large scale of the proposed dairy operation has numerous actual and potential environmental costs that will affect the citizens of the county, most importantly causing the pollution of large amounts of water. All of these issues indicate that the project should be vetoed.

I am concerned about the size of the expansion, at Lewiston, a farm with an increase to 4628 animals. I have a private well and am very concerned about the nitrates levels in our area. I also am a MPCA director for the past 13 years. The root system is not getting any better. Many people are not only confused, and are also by eating and swimming in the root system but I am afraid this will not be available for our grand children. Please consider having an EIS for this huge expansion in our area. Respectfully, Scott Ker

As a citizen, I want the MPCA to do its job: to follow Minnesota law to protect the environment, water quality and quantity, health and quality-life for everyone affected. Without a doubt, the scale and implications of this proposed factory farm expansion require that an in-depth Environmental Impact Statement be completed. An EAW does not do the job of an EIS. The proposal for the expansion of the Daley farm is promising to say the least. The karst geology of the Lewiston region any contamination of this karst geology tends to channel the contaminants straight to the surface water deep into the ground. The DNR shows the proposed rate [of new constructed wells] may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands. Why are we taking chances at all the possibility of polluting our water, our air, our soil? It is unclear why we expose the possibility at all. Winona County’s ordinance is clear: no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. This cap acknowledges the really that, in karst country, there is a limit to how many animals you can pack into one location when you are storing liquid manure in lagoons. Please carefully examine the impact of allowing this farm to grow. Thank you.

There are many environmental and community health reasons to limit these mega dairies farms. Another reason is people’s health. Contrary to what we have been told, dairy is seen by many scientists as contributing to obesity, autoimmune diseases and much more. I recommend “The China Study” by T. Colin Campbell. More and more people are looking to plant based milk products as a way to address both human health and the health of our planet.

The extra added cow manure will cause the smell in the neighborhood as well as the potential runoff in the spring. My thoughts are that added manure could add more nitrates to the wells in the area. We all use the water but the cows use more and create more waste. Yes the cows use much of the fertilizer from the manure but seems excess for the area.

I support farmers. And I know that the Daley is a nice people. But I am extremely concerned about this huge feedlot that is being considered. The environmental risks are great. The people of Winona County Must be protected. We count on the MPCA to assure this. Points I hope that you will strongly consider: 46.3% of wells tested in Utica County have nitrates above the standard designated as safe drinking water. • Our water is vulnerable. Because of our karst geology, any contamination can therefore be widespread in its detrimental impact. • Our own governmental department, the DNR, states that the 46,000,000 gallons of manure produced annually by this proposed project will likely have a damaging effect on citizens’ wells and public waterways. These likely contaminations cannot be fixed once they’ve happened. • This project would require the most vulnerable because of our karst geology. Any contamination can therefore be widespread in its detrimental impact. Our own governmental department, the DNR, states that the 46,000,000 gallons of manure produced annually by this proposed project will likely have a damaging effect on citizens’ wells and public waterways. These likely contaminations cannot be fixed once they’ve happened. This project would require the

Mr./Dear: Up here in northern Minnesota, to have a timber sale, start a mine, or build or roadways, it is a requirement under federal and county law to have a true Environmental Impact Statement performed by the Minnesota Department of Natural Resources. The county in which this animal project (Daley Farms of Lewiston LLP 2018 Dairy Expansion) is proposed has already been a limit on the amount of cows allowed on a farm within the county. Their due diligence: Abide by the laws as written and perform a proper EIS for this massive project. Thank you. Mark S. Roason

To MPCA decisionmakers I believe that all Concentrated Animal Feeding Operations (CAFO) take a toll on people living close to them. To examine the impact of allowing this farm to grow and expand requires due diligence: Abide by the laws as written and perform a proper EIS for this massive project. Thank you. Mark S. Roason

The MPCA decisionmakers I believe that all Concentrated Animal Feeding Operations (CAFO) take a toll on people living close to them. To examine the impact of allowing this farm to grow and expand requires due diligence: Abide by the laws as written and perform a proper EIS for this massive project. Thank you. Mark S. Roason
in depth study when dealing with the karst landscape of SE Minnesota. Twice have sewage lagoons in the past disappeared in a sinkhole. What proof do you have that you have a manure holding lagoon the size of 3 football fields, 16 feet deep will hold in this karst landscape. Indepth modeling needs to be done first. In closing I want to express my disappointment with MPCA in this matter. I hope you reconsider your role as watching out for folks health not those of cows and pocketbooks. Since clearly MPCA does not care for folks health.

297 Hello, I am concerned about the environmental impact of this proposed expansion. Per information I received from The Land Stewardship Project, "The proposal will annually produce 46 million gallons of manure and wastewater in an area where karst geology channels contaminants from surface water deep into the ground." This seems excessive, especially as per the LSP. "...[The] proposed massive expansion...is not allowed under...Winona County Ordinances...[Winona County's ordinance is clear: no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. This cap acknowledges the reality that, in karst country, there is a limit to how many animals you can pack into one location where you are storing liquid manure in lagoons]. The Daleys' farm was over the 1,500 animal units cap at the time the ordinance was adopted and so was "grandfathered in." This means it could continue but could not expand (increase its non-comfortability)." Please do not allow this expansion to go forward. Thank you, Luke Anderson

298 To whom it may concern, We are strongly opposed to Daley Farms expansion due to the environmental impact in addition to the effects on human health. This is not needed and sets us back. Countless studies suggest dairy is detrimental to human health and can only pack on more of the same. This is one of the last things Lewiston and the rest of the county needs. We look forward to the future, not go backwards.

299 I write on behalf of the community affected by the Daley Farms expansion and all the dangers it poses to the environment and water in this area. I feel it endangers the very life of this farmland surrounding land and atmosphere, the ground water will be negatively affected. Do not approve of this expansion now or in the future.

300 Winona has a limit of 1500 animals per farm. Why are the local laws ignored in this case? This could become an environmental disaster for the region. Please reconsider.

301 I am a concerned citizen, and realize that it is imperative in today's world that our first priority has to be to understand and honor the integrity and rhythms of creation. We counter them at our own peril. Whatever our global, or environmental, or economic, or family, or personal end game, if we think we can outwit nature, we have head in the sand. We have to look down the pipe 7 generations and be honest: what do we see? If our decisions and actions of today degrade earth's sustainable ability, we have no business even putting them on the table.

302 I am writing about the proposed expansion of Daley Farms of Lewiston. Having over 4,000 cows in an operation is against Winona County's ordinance, and there's a reason for that. As a Minnesota resident with an aunt and uncle who live in an area that could be affected by a large dairy scale operation, I know that an environmental impact assessment is necessary. The streams and wetlands surrounding a large factory farm like that can be affected negatively. Water quality isn't something that should be messed with or risked for the sake of big dairy producers. I'm writing to ask that you respect the county's ordinance that caps a dairy operation at 1,500 animals and respect the residents who would be negatively affected by Daley Farms.

303 Please oppose this Dairy expansion for Daley Farms of Lewiston. Reasons 1) what will the impact be on the amount of water required from the aquifer? Will this withdrawal impact adversely other farm operations and citizens' wells within the watershed? I live in Stearns County, a large dairy county, supporting many small/dairy medium operations. I also rely on ground water as my major source of water. Large expansions of any dairy operation ethically should not impact access to clean water for others. 2) Manure management is of great concern. Improper spreading on land in a karst region of Minnesota is serious. If Daley Farms does not have enough of their own land to take care of this manure that poses land and transportation concerns if they use a lagoon the same concerns apply. 3) Control of the market: Bigger operations end up having unfair access to the market. This is one reason why small/medium farms can't survive. In addition as an operation gets bigger it poses concerns over animal care and diseases. Please look more to a future of small/medium farms as is happening state-wide vs mega farms taking over the state vs mega operations concentrating on the market.

304 This project clearly vitiates responsible stewardship of our EARTH. It will pollute our streams, lakes, wetlands, air which will affect people of a negative in a huge way. The use of water alone is a huge concern especially on our aquifers. PLEASE DO THE RIGHT THING and do not allow this massive expansion! Thank you and God bless.

305 Hello, Please prohibit the permit for Daley Farms to increase their calf and cow numbers. You need to help protect the environment, water quality, and quantity of life people. Increasing the cattle numbers will be a detriment to the bottom line of the Earth and all that depends upon it. Conserve the safety of the manure containers. Sinkholes, tomatoes, human error - too much risk to allow such an increase. Thank you for considering the right decision. Please listen to the people concerned. Sharon Vipond

306 Please do not proceed with the Daley Farm Mega-Dairy expansion. Raising cows for breast milk produces a tremendous and unnecessary burden on our environment. According to the USDA Natural Resources Conservation Service, 250 cows produce as much nitrate/nitrogen as 5,000 people. By that count, the 4,628-cow Daley Dairy would conservatively produce as much nitrate/nitrogen as a town of 90,000 people. Citation: https://www.nrcs.usda.gov/wps/portal/nrcs/detail?cid=nrcs1401211. The proposal will annually produce 46 million gallons of manure and wastewater. Dairy has been linked to an increased risk for prostate cancer, lung cancer, breast cancer and ovarian cancer. Three servings of dairy per day increases the risk of death from prostate cancer by 141 percent. People with higher dairy consumption are also more likely to be diagnosed with breast cancer and ovarian cancer. Cancer Prevention Plan. Since this project is proposed in an area with karst geology which channels contaminants from surface water deep into the ground, this seems excessive.

307 I support the expansion project of Daley Farms of Lewiston. I feel their farming practices are environmentally sound and are in the best interest of the public by minimizing traffic and odor in a livestock business. I also support an expanding business in our community. I think it is needed to support the local towns and keep enrollment up in our schools. It will also create more jobs in the community not just on the dairy but all the supporting businesses that will be servicing the Daley Farms.

308 In reviewing the EAW for the Winona County Soil and Water Conservation District, We had a few things that came to mind. None of them to the point of requesting an EIS, but something that should be taken into considerations: 1. Since nitrates in groundwater are a big concern in this area, we want to reiterate that all spreading of manure will follow proper setbacks from Karst features. It is especially important that these setbacks be adhered to and confirmed with commercial haulers when they are being used. 2. Verbal agreements for spreadable acres may not be a strong enough commitment when adequate proof is not available to be confirmed. 3. This Stormwater Pollution Prevention Plan is critical to this project. A Stormwater Pollution Prevention Plan. If you have any questions, you can contact the writer, the Winona County SWCD can review the SWPPP if given a copy. 4. With potentially 15 acres of new impervious surfaces from this project, and the increased rainfall amounts and intensities over recent years; designing permanent treatment to control only 1" of volume runoff from the project site may not be adequate. Again, these are a few concerns or comments, but not enough to ask for an EIS.

309 Please do not expand this and wreck the environment/promote animal cruelty.

310 I am not concerned about the Daley Farms' proposal to go more than that, its dairy herd from 1,768 cows and calves to 4,628 total and its' negative environmental impact. It is imperative that the MPCA follows Minnesota law to protect the environment, water quality and quantity, health and quality-of-life for everyone affected. As such, an in-depth Environmental Impact Statement MUST be completed for this proposed expansion. Many factors must be considered to include but not limited to the following: Well testing conducted by the Minnesota Department of Agriculture in 2017 showed that 46.3 percent of the wells tested in Utica Township exceeded the safe drinking water standard. According to the Minnesota Natural Resources Conservation Service, 250 cows produce as much nitrate/nitrogen as 5,000 people. By that count, the 4,628-cow Daley Dairy would conservatively produce as much nitrate/nitrogen as a town of 90,000 people. Citation: https://www.nrcs.usda.gov/wps/portal/nrcs/detail?cid=nrcs143_014211. How will the drinking water in the area be kept safe? The project would annually use 92 million gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 million gallons of water per year. What impact will this major use of water have on Lewiston's aquifer? Yes NO to the Daley Farms expansion! Its not fair! It will pollute hugely. It should not be allowed!

311 We don't need more or larger animal confinements. We used to live in northwest Iowa. While there we couldn't fish or swim in the waters. We couldn't open our windows, especially at night. The poisonous air caused us respiratory problems, even with windows closed. WHY SHOULD WE HAVE TO LIVE IN A SEWER??!!!
I am attaching my comments regarding the Daley Family Farm Expansion. Please see attachment for comments and thoughts on this proposal. This is a very important and vital for the future of upcoming generations of the Daley Family Farm. Thank you for your time.

The extraordinary expansion of this dairy herd was an unpleasant surprise when I learned of it in the Mpls. Star Tribune. The fact that - from what I understand - no EIS is required is worrisome at best. The study of groundwater quality and quantity implications alone would need to be considered in the manure management issue, accruing from these cows. Please, MPAC, do your job and make sure this expansion is environmentally sound for that region, Lonni McCauley League of Women Voters Upper Mississippi River Region ILO

We the people demand an EIS!

To whom is may concern regarding the proposed Daley Farm Expansion, as a Minnesotan I have grave concerns regarding the proposed expansion of Daley Farm operations. I do not believe an operation the size as be a be provided to benefit our environment, community or our economy. But, of particular concern is the potential for manure leakage where leakage could devastate groundwater supplies. However, even if a spill did not occur, the amount of water usage for that number of animals would be astronomical, at 92 millions gallons a year - above what the total population of the town of Lewiston uses in a year. The proposed expansion would also annually generate 46 millions gallons of manure and wastewater - a large concern since sinkholes have occurred on the Daley Farm property in the past and if it happens again near or on one of the proposed new wells - may be in conflict with a Winona County ordinance that limits feedlots to 1,500 animal units or less - passed in 1998. Why doesn’t this ordinance apply to the Daley Farm expansion? Why you are trying to circumvent county law? This expansion should not be approved, but at a very minimum, a full EIS should be conducted so the environmental and community costs can be reviewed and evaluated. Sincerely, Shannon Martin

I feel conflicted. I have known the Daley Family for fifty years and know them to be upstanding, generous, caring people, friends, outstanding conservation-minded farmers - model citizens! It’s not very often that I disagree with something, but this takes news in the Mpls Star Tribune, but the DNR had a legal obligation to do due diligence. In those fifty years, I have learned a lot about the karst topography of our region, its springs creeks and this marvelous coldwater fishery. Lewiston, MN, also the Mpls Star Tribune on February 2, 2011, with an article with a title of Lewiston, titled “Poison on Tap.” The article focused on the condition of our tap water. Spring creeks are under appreciated. Even though within a 20 mile radius of where we are tonight (at the Lewiston Community Center which is less than two miles from the Daley farm) there are over 30 spring creeks, globally and nationally, spring creeks are rare. How rare? 2% of the earth’s water is fresh water, not saltwater. But only 1% of the earth’s fresh water is not frozen in the Poles. 1% of that 1% is in a river or stream, not in lakes, 1% of that 1% of 1% is in a spring-fed creek. That’s how rare and precious they are. Governor Dayton, who happens to be in Rochester today, after his back surgery the other day says: "In the land of 10,000 lakes, clean water should be a right, not a privilege. But the reality is that the quality of our lakes, rivers, streams, and groundwater is threatened by many sources all across our state. We are at a crucial moment – we cannot let water quality become worse or we can together to reverse the damage that has been done and prevent future water degradation.” “It will take all of us working together to protect our waters for ourselves and future generations.” Hence, the goal to improve our State’s water quality 25 percent by 2025. From that initiative, I learn that all drinking water in the southeast region comes from groundwater. Southeast Minnesota is especially vulnerable to groundwater contamination. Karst topography means this region needs to take extra steps to protect drinking water supplies from nitrate, bacteria, pesticides, and fertilizers. And that is why Winona County set the caps on livestock facilities; to protect human health and the environment. What will the ramifications be from siting a dairy herd of this size - some say the equivalent of a city of 70K people - near a town with the history of groundwater contamination being a concern (i.e. the Grover spill)? What will we be responsible 10 years down the road? We are all stakeholders in a fragile karst ecosystem as the one in Lewiston. How do you balance clean water with economic growth? We the people demand an EIS! Relevant information to the Daley proposal from the 25% by 2025 initiative: “Major threats to groundwater Nitrate – One of the most common water pollutants in Minnesota groundwater, affecting a large number of private wells and public water supplies. Elevated nitrate in drinking water can be harmful to human health, specifically to the health of infants. Septic system removal doesn’t remove your nitrate in the soil. In other words, in some karst landscapes, there are no natural processes to remove nitrate. This means that if we remove a septic system, the nitrate will continue to build up in the soil. This source of nitrate could then be washed into streams or other water bodies.”

I oppose the expansion of the Daley Farm and request/believe an EIS is required. This isn’t about a family. This is about the MPAC doing its job and following Minnesota law to protect groundwater, water quality and health, quantity, health-and-life-of everyone for affected. Without a doubt, the scale and implications of this proposed factory farm expansion absolutely requires that an in-depth Environmental Impact Statement be completed. It doesn’t matter how many pages are added to the assessment worksheet process — an EAW does not do the job of an EIS. **The project would annually use 92 millions gallons of water. The city of Lewiston (pop. 1,564) uses 33.5 millions gallons of water per year. What impact will this major use of water have on our aquifer?** **From the EAW: Daley received DNR’s preliminary approval letter on February 20, 2017 to construct the new wells for the Project on October 30, 2017. However, the DNR has stated that no other water user may introduce interference with other water uses or have negative impacts on nearby lakes, streams or wetlands.** Also, “The DNR’s preliminary approval to construct a well is not an approval to use or pump the well.” **The proposal will annually produce 46 millions gallons of manure and wastewater in an area where karst geology channels contaminants from surface water deep into the ground. Lewiston’s municipal sewage lagoon disappeared into a sinkhole in 1991. What if one of the multi-million gallon lagoons at this project disappears into a sinkhole? The municipal lagoon in Altura failed due to a sinkhole in 1976. The same thing happened in Bellechester in 1992.** **Well testing conducted by the Minnesota Department of Agriculture in 2016 showed that 46.3 percent of the wells tested in Ulica Township exceeded the safe drinking water standard for nitrates.** **According to the USDA Natural Resources Conservation Service, 250 cows produce as much nitrogen as 5,000 people. By that count, the 4,628-cow Daley Dairy would conservatively produce as much nitrogen as a town of 90,000 people. Citation: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/north/tn/?cid=nrcs143_014211** **The proposed manure basin would have a surface area equal to 3.3 football fields – and it’s designed to be 16-feet deep. Why is the MPAC doing an EAW on the Daleys’ proposed massive expansion when it is not allowed under Winona County Ordinances? Winona County’s ordinance is clear: no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. This cap acknowledges the reality that, in karst country, there is a limit to the number of animals we can pack into one location where we are storing liquid manure in lagoons. The Daleys’ farm was over the 1,500-animal unit cap at the time the ordinance was adopted and so was grandfathered in.” **This means it could continue but could not expand (increase its non-conformity).** **Why don’t the rules apply to everyone equally? Please complete an EIS before allowing this expansion that would be detrimental to the surrounding environment and population.”

I was born in southwestern Wisconsin (La Crosse) and currently live in Minneapolis. I have grave concerns regarding the legality, water usage, and the potential contamination of groundwater in an already-delicate landscape of the EAW for the proposed Daley Farm expansion and this is why I am writing to you today. Firstly, the MPAC should not be doing an EAW on the Daleys’ expansion when Winona County ordinances do not even ALLOW feedlots over 1,500 animal units (a cap passed in 1998). I understand that the farm was “grandfathered in” because the farm was over 1,500 animals in 1998, but as the ordinance has been in place for 20 years, the farm should not even legally be allowed to expand. Why is the proposal Winona County ordinances do not apply to the Daley expansion, I will continue with other concerns that need to be addressed if the project does move forward (which again, legally it should not). The expansion will annually use nearly three times the amount of water that the entire population of Lewiston uses—(92 millions gallons to Lewiston’s 33.5 millions gallons). How will this water usage impact the water table in this karst region, where it is more critical to retain groundwater? What are the LONGTERM effects of such an expansion, when we are facing a true environmental crisis? Does this EAW consider how Daley Farms’ expansion will affect future generation or Lewiston area residents? The study does not account for other water uses of this size or have any impacts on of water uses of this size or have any impacts on nearby lakes, streams, or wetlands.” We need a full EIS on this project because it is clear that the EAW raises some serious matters. Thirdly, the expansion will produce enormous quantities (46 millions) of manure annually. In a fragile karst ecosystem as the one in Lewiston, this is a risk I simply don’t think we can take in this moment for the health and safety of folks in this community who rely on clean water. I am not a professional geologist by any means, but even I have an understanding of how contaminants travel in karst landscapes—far and deep, much more so than in other areas. Lewiston has already one
sewage lagoon disappear into a sinkhole in 1991—what if one of the manure lagoons disappears as well? Is the benefit to one (already large) company worth the risk to thousands of people who live around the project? 46.3 percent of wells tested in Utica Township already exceeded safe drinking water standards for nitrates in 2016. The expanded 4,628-cow Daley Dairy expansion would produce as much nitrate as a town of 70,000 people (because, according to USDA Natural Resources Conservation Service, 250 cows produce as much nitrate as 5,000 people). In other words, the project is not feasible. I sent this mailer first because it had to be addressed before any further movement is made on this project—firstly regarding the legality of the venture at all, and, if for some reason it is found that the Daley expansion is an “exception” to Winona County ordinance, then secondly a full EIS and more dialogue with the local community before any further movement is made with this project. Many of those affected (such as smallholding farmers nearby) were not able to attend the October 16 meeting in the town of Utica, and the short notice (requested by Daley farms, believe otherwise of course) was on board with the project, of which many members present do not support. Do not thank you very much for reading and I look forward to hearing from you regarding these serious concerns. Sincerely, Abigail Hendson

320 I am emailing in regards to the MPCA needs to do to protect the environment, water quality and quantity, health and quality-of-life for everyone affected by this Daley Farms Proposed Mega-Dairy Expansion. Why is the MPCA doing an EAW on the Daleys’ proposed massive expansion when it is not allowed under our Minnesota Water Quality Standards? Winona County’s ordinance is clear; no feedlots are allowed over 1,500 animal units. This animal unit cap was passed in 1998. This cap acknowledges the reality that, in karst country, there is a limit to how many animals you can pack into one location when you are storing liquid manure in lagoons. The Daleys’ farm was over the 1,500-animal unit cap at the time the ordinance was adopted and so was “grandfathered in.” This means it could continue to not increase its nitrate non-compliance. The project would annually use 233 million gallons of water. per week. What impact will this massive use of water have on our aquifer?

321 I feel the Daley Family Farm will do everything necessary to be in compliance with manure application. The Daley Family Farm has been an asset to the dairy industry as well as the Lewiston area for many years. They have not only provided jobs for many local people, but have been a financial asset to Winona county. We must all do whatever is necessary to help promote the agricultural industry especially during these very trying times for all farmers.

322 Dear MPCA Staff, My name is Rachel Stoll and I am a beef and pork farmer in Wiscy Township in Winona County. I have read the EAW regarding the Daley Dairy expansion and I have several questions and concerns both about what the EAW says and does not say: • On page 3 of the EAW, it is stated that the animal mortality building’s location is TBD- will that location be known by the MPCA before their determination of the necessity of an EIS? • Page 5 discusses the mechanics of the storage basins, where will runoff from sewage basins be discharged and at what rate? • On page 7 the EAW section lists resources in close proximity to the proposed expansion. Why would the MPCA approve the expansion without an EIS while simultaneously acknowledging that the following resources are in proximity to the feedlot: • manure storage areas or within or adjacent to the boundaries of the manure application sites: • drinking Water supply management areas designated by the MN department of health • Public water supplies within two miles of designated public parks, recreation areas or trails • State listed species, rare plant communities or other sensitive ecological resources • On page 9, the EAW states, “Daley will minimize construction in the grassed waterways”. How does the MPCA plan to quantify and corroboration that? • On page 10, the EAW discusses the karst geology of the region and notes known sinkholes. How can the MPCA approve such a large operation without an EIS while acknowledging that karst geology in general are, “hazards to ground water” where feedlot systems are located? • On page 11, ‘DNR has determined that the project area means that large-scale feedlots and more vulnerable that have become the norm in other parts of the state are really dangerous here. Daley will take measures to ensure that nitrate leaching loss is not exacerbated’. What measures does Daley intend to take? How will those efforts be monitored and corroboration? Since nitrate contamination is already an issue before the MPCA can take any action that which at its best will not exacerbate nitrate leaching loss? (page 22) • Since there is no rating for determining a sensitivity of the water table because of the surface karst feature development, how can the MPCA accept only this EAW in determining possible ill-effects of this expansion? The EAW has no section to discuss economic effects of such an expansion. As a small farmer, I am very concerned with large scale farming operations and their impact on the environment and health of rural communities. I have attended many meetings about the Daley Farms’ expansion. I firmly believe that nitrate leaching loss is an issue. The Daley Family Farm has been an asset to the dairy industry as well as the Lewiston area for many years. They have not only provided jobs for many local people, but have been a financial asset to Winona county. We must all do whatever is necessary to help promote the agricultural industry especially during these trying times for all farmers.

323 Hello- I am farmer outside of Rushford and I am very concerned about the proposed expansion to the Daley Farms operation. As a small livestock farmer, I am concerned about the economic impact that such an expansion will have on other dairy farmers in the region. The EAW does not touch on environmental impacts which is one of the reasons I think that this project needs an EIS. Another concern I have is regarding the geology of the region. Municipal sewage lagoons have disappeared into sinkholes very close to where the project proposes to build very large manure lagoons. I noticed that the EAW marks all known sinkholes as open. Is this because they are not actually open or how do they plan to protect the water quality if one of Daley Farms lagoons disappears? Already, almost half of wells in Utica are unsafe to drink from because they exceed safe nitrate levels. How can the MPCA approve a project in that region without an EIS since so many wells have already been compromised? Lastly, I am very concerned with how the Daleys currently run their operations. I know that they are currently above the animal unit cap in Winona County, and I know that they have been approved to increase their herd size by a variance, thereby avoiding spending taxpayer money for their staff (and the numerous other expert staff in other agencies) over a trying time for all farmers.

325 Public Comments Regarding Daley Farms of Lewiston, LLP - 2018 Dairy Expansion First and foremost, I seriously question the propriety of the MPCA spending taxpayer money to conduct an EAW for a project that is without question a prohibited land use in Winona County. This project exceeds the animal unit cap for the county, and is thus prohibited. MPCA staffer, Kim Grosenheider informed me that the MPCA was aware of this, and they were told by the applicant that they would need to get a variance in order to proceed. It would seem the appropriate action on the part of the MPCA would be to decline to perform the mandatory EAW until such time as the applicant actually received a variance, thereby avoiding spending taxpayer money for their staff (and the numerous other expert staff in other agencies) over a trying time for all farmers.
year to complete the EAW. At this point, this project is still not a legal land use in Winona County. Aside from this particularly thorny issue, there are a number of reasons an EIS should be required for this
project. As stated earlier, there is an animal unit cap on feedlots in Winona County. One of the primary reasons for this is water quality in our Karst geology. Because of poor water quality (nitrates), local
governments have had to drill new wells and implement mitigation methods to provide water to cities that will meet minimum quality standards. Private wells, from which most rural residents get their drinking
water, also suffer from nitrate levels which do not meet minimum healthy standards. MPCA staff and industry frequently refer to “best practices” when talking about preserving water quality. These “best
practices” typically do not take into account the fact that our changing climate has made severe weather events far more frequent — it doesn’t matter how thick manure pond linings are if the manure pond
overflows due to heavy rain and/or flooding. This poses a very real threat to groundwater quality, something that and EIS should examine. In addition, has any analysis been done regarding the locations on
which the manure is to be spread? Are they receiving manure from other sources? Have nitrate levels been actually monitored in any of these locations with devices such as lysimeters? How will it be
determined whether the crops are absorbing the nutrients, or if they are going into groundwater, making an already severe water quality problem even worse? And, even if it were ever proven that the manure
application was contributing to the nitrate problem, what party is responsible for cleanup? The dairy? The landowner on which the manure was applied? The MPCA? It it is the MPCA, then it ends up being the
taxpayer. In addition to contaminants such as nitrates, other types of potential contaminations should be examined, such as phosphorus, antibiotics, and hormones. Another particularly troubling factor is the
DNR’s statement in the EAW, “The DNR has stated in the preliminary approval letter, that DNR has “determined that the proposed rate and volume may interfere with other water uses or have negative impacts
on nearby lakes, streams or wetlands.” This alone should be sufficient to do a full EIS, and the report points out, “State law establishes domestic use as the highest priority. . .”. Why should a resident with a
private well be forced to go through a “standardized procedure of investigation,” doubtlessly a long, involved, bureaucratic, perhaps expensive process which may or may not end up proving their well dried up
because their neighbor needed a high-capacity well to expand their dairy well beyond what is legally permitted in the county? Which party will have the financial resources to prove their position? The owners of
an enormous dairy, or the neighbor? Lastly, the EAW did not examine the effects of this expansion on the economics of the area. This particular business has already demonstrated a propensity to ignore labor
laws. For more information on this, please reference the Winona Post article from 2/24/13, titled, “Federal agency rules in favor of farm workers in labor dispute,” outlining Daley Farm violations for which the
farm was ordered to pay $86,385 in unpaid wages and damages. Aside from the poor employment conditions the above referenced article indicates, such factory farms typically do little to benefit the local
economy. Smaller family farms typically do business locally with regard to feed and equipment, while larger mega-dairies do business outside the area, and generate few quality jobs for local residents. Also, the
sheer scale of this dairy threatens to put smaller operators out of business in this tight dairy market. I am sure there are other key economic effects that should be thoroughly examined through an EIS. It should
be obvious that a full Environmental Impact Statement be required on this project for numerous reasons. The key reasons in my mind are the following: This project is prohibited by the Winona County Zoning
Ordinance. The enormous volume of manure puts already impaired water at risk - both public and private wells. The proposed volume of water to be used (which is nearly equivalent to adding three new towns
the size of Lewiston) “may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands.” The economic risks posed by this project have not been examined. The outcome of an
EIS will make clear why Winona County has prohibited a land use such as this in the first place. Sincerely, Kelley Stanage Winona County resident
326 It is obvious from the Environmental Assessment Worksheet that an Environmental Impact Statement must be conducted to address numerous questions about the environmental and human health impacts of
the Daley farm's proposed expansion. Questions that must be addressed in an EIS include the following: How many animal units are already registered in Utica Township? How many animal units are already
registered in Winona County? What is the animal unit carrying capacity for an area such as Winona County, with shallow topsoil, numerous sinkholes, and fractured limestone bedrock? How would the Daley
farm’s proposed expansion impact the animal unit carrying capacity for Utica Township and for Winona County? Numerous sinkholes are located in the area where Daley’s intend to inject liquid dairy manure.
How does the Daley farm’s planned injection of liquid manure, which is high in nitrates and other drinking water contaminants, protect groundwater from being contaminated, if liquid manure is to be injected in
the soil below the zone of biological decomposition? Dairy cows are a major emitter of greenhouse gases. What are the greenhouse gas impacts of adding approximately 3000 animal units to Winona County?
Consumers are increasingly concerned that non-organic milk, such as milk produced by the Daley farm, contains residues of pesticides, including chlorpyrofos, glyphosate, dicamba, 2,4-D, and neonicotinoids.
Does the milk from the Daley farm contain pesticide residues? If so, what pesticides are present, and at what levels? What are the human health impacts caused by consuming milk with pesticide residues?
According to private well test data from the MN Department of Agriculture, about half of the wells in Utica, Fremont and other townships adjoining the Daley farm are already unsafe to drink due to nitrate
contamination. How would the addition of nearly 3000 animal units impact nitrate levels in private wells? Municipal wells in the immediate area have also experienced significant nitrate contamination. How
would the addition of nearly 3000 animal units impact municipal wells in Winona County? The University of Minnesota has found that shifting land use from pasture to row crops significantly and negatively
impacts both ground and surface water quality, increasing contamination levels for nitrates, pesticides and sediments, and well as increasing runoff rates and soil erosion. Would the addition of nearly 3000
animal units increase the amount of land in row crop production, since the animals will be confined and not pastured? When nitrates are found in drinking water, follow up tests often show that the same wells
and aquifers are contaminated with pesticides. What are existing pesticide contaminant levels in Winona County, and specifically in the townships where the Daley farm and manure application fields are
located? How will the Daley’s proposal impact pesticides levels in drinking water wells and aquifers? How can ground and surface water contamination with nitrates and pesticides be reversed? Cancer rates
are already high in western Winona County, which is informally known as a “cancer cluster.” How will the Daley’s proposed expansion impact cancer rates in western Winona County? The rise of antibioticresistant bacteria has become a major human health concern. Approximately 70% of the antibiotics used in the US are used in livestock production, as a prophylactic or to stimulate production. Does the Daley
farm routinely use antibiotics, in the absence of disease? If so, does the Daley farm have a plan to decrease their use of antibiotics? During the public information session in Lewiston, MPCA feedlot official,
Mark Gernes, stated that 3 out of 4 of the Daley’s existing facilities are out of compliance with Federal pollutant discharge requirements. Mr. Gernes indicated that those non-compliances would be addressed, if
the Daley’s are allowed to expand. How can the Daley’s be allowed to operate, if the MPCA is aware that their existing facilities are out of compliance? During the public information session in Lewiston, a Daley
family member stated that their existing facility, which is only 20 years old, is already worn out and needs to be replaced. What is the life expectancy of the Daley’s proposed expansion? How would the Daley’s
proposed expansion improve the quality of life, including the quality of health, for area residents? Southeast Minnesota is experiencing extreme weather events on a regular basis, with rainfall totals ranging
from 2 to 17 inches per rain event. How would the Daley’s proposed expansion impact the resiliency of the region to withstand frequent extreme weather events? Pollinator populations are in decline, according
to numerous scientific studies. The UMN has shown that Monarch butterfly populations have decreased by 90% in recent years, and the researchers attributed the decline to the widespread use of “Roundup
Ready” crops. Does the Daley farm grow “Roundup Ready” crops? If so, how would their proposed expansion impact Monarch butterflies? Neonicotinoid insecticides have been found in streams and rivers in
100% of the samples tested by the US Geological Survey. Neoniotinoids are implicated in honeybee colony collapse and the loss of native bees. Does the Daley farm use seeds treated with neonicotinoid
insecticides? If so, how would their proposed expansion impact honeybees and native bees? Southeast Minnesota is home to the most cold water springs in the state. Many of these streams support healthy
trout populations and are a source of tourist revenue. How would the Daley’s proposed expansion impact cold water streams in SE MN? How would the Daley’s proposed expansion impact trout populations in
SE MN? Amphibian populations, including frogs and toads, are in decline in MN due to pesticide exposure and loss of habitat. How would the Daley’s proposed expansion impact amphibian populations in SE
MN?
327 Pg 5 of EAW describes Manure Basin construction proposal "install a drain tile system around the base of the manure basin to control fluctuations in seasonal saturation." Climate change patterns for SE MN
project (See MN Dept of Health Aug 2018 "2018 Planning for Climate and Health Impacts in SE MN, pg 3, available online), an increase in weather events and related natural disasters....a higher frequency of very
heavy rain events...." In 2007, SE MN experienced an extreme weather event of over 15" in 24 hour period, resulting in flooding, mud slides, road washouts, etc. An EIS is needed to examine various rain event
scenarios vs the level of liquid manure in the Manure Basin to determine various flooding potential for 1", 2", 4", 6",8", 10", 12", 14", 16" rainfalls and various levels of manure, such as 1/4 full, 1/2 full, 3/4,
8/10th full. At what level and amount of rain would the drain tiles fail? Prediction of this type could prevent catastrophic contamination. Storm run-off capacities should also be determined for the other
structures in the proposal. Additional EIS considerations: 1) impact on existing aquifer with the increased water usage for 30 years. How does this impact other wells in the area and the cost of replacement


examine what would happen if, for whatever reason (new sinkhole opening, effects of excessive rainfall on the area, etc.) the lagoon would crack, leak, or structurally fail. The significant potential environmental
will need to be conducted by an impartial team of geologists, soil scientists and agronomists. I am also deeply concerned with the size of the proposed manure lagoon. To my knowledge, this lagoon would be the
"biologically dormant" periods. Has this research been done? If not, it should be done as part of the EIS. An EIS should also be done so that a full examination of the municipal well history of the City of Lewiston,
exceeded the safe drinking water standard for nitrates. • According to the USDA Natural Resources Conservation Service, 250 cows produce as much nitrate/nitrogen as 5,000 people. By that count, the 4,628-
should not issue permits when past history of the operation shows continued feedlot violations. Even though this proposal mitigates these violations, the operation should not be permitted to increase the herd
spread, apparently, in an emergency, in winter or in violation of the conditions of the permit. What constitutes an emergency should be spelled out. For instance, would prolonged wet weather?
The MPCA willing and able to successfully carry out the oversight? Please put this on hold until the guarantees
Daley's be willing to deal with the necessary overview to assure we don't contribute to more nitrogen contamination? This is a huge issue and the oversight must be in place before any permit is granted. Is the
As a consumer
project, conduct a financial
studies have shown that pollution from these facilities is
To Daley project reviewers at the MPCA: I believe that this project needs a full Environmental Impact Statement. The proposed project sits in an area already contaminated with high nitrate levels in both rural
wells and in the municipal wells of the City of Lewiston, approximately 1 mile away. The proposal indicates that Daley's will be injecting liquid manure and doing so only after air temperatures drop below 50
degrees. Unfortunately, it is when temperatures drop to this level and lower that biological activity in the soil slows down and effectively stops for the winter. That means nitrogen applied during this period has a much greater chance of moving through the soil surface and contaminating the groundwater. An EIS should include Karst water quality research that shows the effects of injecting liquid manure during "biologically dormant" periods. Has this research been done? If not, it should be done so that the MPCA can determine if Daley's will be allowing nitrogen to move into the soil in a way that is inappropriate in promoting this practice. New research needs to be conducted as part of an EIS that determines whether the use of liquid manure, as Daley proposes, would help or hurt groundwater quality. This research will need to be conducted by an impartial team of geologists, soil scientists and agronomists. I am also deeply concerned with the size of the proposed manure lagoon. To my knowledge, this lagoon would be the largest manure storage facility in the country. An area known for its fractured limestone bedrock, susceptibility to sinkholes, and in the last decades, numerous-100-year rainfall events. An EIS needs to examine if the proposed lagoon will be altered and if, for whatever reason (new sinkholes, etc.) the manure will find its way to the groundwater. The significance of such potential impacts on the environment, the community, and potentially, the surrounding community could be extreme. It is important that the MPCA determine if the project is feasible.

More review is needed before this project should be allowed to proceed. Our water is in serious danger and must be protected. I cannot allow this to proceed without further review and oversight.

To Daley project reviewers at the MPCA: I believe that this project needs a full Environmental Impact Statement. The proposed project sits in an area already contaminated with high nitrate levels in both rural
wells and in the municipal wells of the City of Lewiston, approximately 1 mile away. The proposal indicates that Daley's will be injecting liquid manure and doing so only after air temperatures drop below 50
degrees. Unfortunately, it is when temperatures drop to this level and lower that biological activity in the soil slows down and effectively stops for the winter. That means nitrogen applied during this period has a much greater chance of moving through the soil surface and contaminating the groundwater. An EIS should include Karst water quality research that shows the effects of injecting liquid manure during "biologically dormant" periods. Has this research been done? If not, it should be done so that the MPCA can determine if Daley's will be allowing nitrogen to move into the soil in a way that is inappropriate in promoting this practice. New research needs to be conducted as part of an EIS that determines whether the use of liquid manure, as Daley proposes, would help or hurt groundwater quality. This research will need to be conducted by an impartial team of geologists, soil scientists and agronomists. I am also deeply concerned with the size of the proposed manure lagoon. To my knowledge, this lagoon would be the largest manure storage facility in the country. An area known for its fractured limestone bedrock, susceptibility to sinkholes, and in the last decades, numerous-100-year rainfall events. An EIS needs to examine if the proposed lagoon will be altered and if, for whatever reason (new sinkholes, etc.) the manure will find its way to the groundwater. The significance of such potential impacts on the environment, the community, and potentially, the surrounding community could be extreme. It is important that the MPCA determine if the project is feasible.
because there WILL be an environmental impact if Daley Farms, LLP, proceeds, and we need to know what it will be. Or, if the MPCA doesn’t require an EIS, they need to require Daley Farms, LLP, to put at least one million dollars in an escrow account as an “insurance policy.”

337 Due to our county laws already in place it seems ridiculous to expand one dairy by this many animal units. We are already dealing with high nitrate levels of water in our county. Why would a dairy this size with this much manure and water be allowed in our special karst geological area? Please do an environmental impact study for our entire county. Deborah Niebuhr

338 As a Minnesotan who relies on the MPCA to keep our communities safe from dangerous environmental actors, I am very concerned about the Daley farm being permitted to expand. The proposed farm is simply too big. The amount of water it will use and the waste it will produce will put its community’s groundwater at risk. That risk is unacceptable. The MPCA needs to fulfill its mission and protect the public from dangerous projects like this one. Please do so. Thank you.

339 At a minimum, the MPCA should require an EIS for this project. The county ordinance has been violated and should be protected. I oppose this proposal for the reasons stated in the Star Tribune: “The Daley proposal ... calls for two new wells that would each draw 30 million gallons of water per year, bringing the total used by the farm to 92 million gallons per year. Manure would be spread in areas near municipal drinking water systems that are already high in nitrate, and where karst geology and sinkholes pull contaminants directly from surface fields into the aquifer. And there are already 13 feedlots within a 3-mile radius.”

340 Stop the dairy expansion. It is too many animals for one site. The increased water usage alone compromises the area. It would not be good land stewardship to allow this expansion.

341 The proposed dairy expansion is ridiculous; too many animals for the land to support. Stop it now before it is too late.

342 My family and I are against any kind of expansion of any feedlot in Winona County. We live across from a fairly large dairy farm and there are times when we are unable to hang our clothes out to dry because of the foul odor coming from that farm. Just this past week, after they put their manure accumulations from this summer out into their fields, we could not get away from the odor for a couple of days. The New York Times (amongst other news outlets) reported on what happened after Hurricane Florence moved through North and South Carolina and it wasn’t pretty: https://www.nytimes.com/2018/09/19/climate/florence-hog-farms.html

343 Dear Sir The city of Lewiston MN has a population of 1564 people according to the city’s web site. For the sake of argument, let’s assume each person uses 20 gallons of water a day. Over one year, Lewiston MN produces 11 417 200 gallons of sewage. Minnesota requires the city to operate a sewage disposal plant to treat all of its waste water. The Daley farm expansion would create 46 MILLION gallons of liquid manure every year. They plan to store this liquid manure in lagoons or ponds. Why isn’t the Daley Farms operation required to treat all of their manure like the city of Lewiston? It appears to me a lot more study is required for an EIS as a supplement to the EAW because of the size and scope of the project and the sensitive geography on which the farm is located.

344 I believe the expansion of the Daley feedlot to over 3 000 cows is a extremely poor idea for Winona County. Sure they’ll have a holding pond, etc. but then we’ll have one of these 1 000 year floods that come these days, those nitrates are going to find their way into our aquifers, streams, Wells. Karst topography is not conducive to such a factory farming. Don’t want our grandkids and their grandkids to have clear water! That should be a very in depth environmental assessment of this project! The most the law can provide. No one farm in this area in the past had such a huge number of cows. Please don’t let this happen here. Thankyou. Scott Doblar in Winona

345 Dear Mr. Clark, on October 16th, 2018, I attended a public information meeting on this matter in Lewiston, MN. After listening to many verbal comments from the audience, it became clear that there was a group present that was organized to shut this project down no matter what the facts were. This group is well organized, very radical and very focused on shutting certain projects down. Historically, the tire burning project in Preston MN, ethanol plant Eyota, MN, sand ban Winona County, etc. Please make sure your decision are on the facts and not on pressure from a special interest group.

346 Thank you for the opportunity to comment on this expansion proposal. It seems very clear that this expansion would be detrimental to the health and vitality of the land, air, and water in our local communities. Everything is connected in the ecosystem. We can’t pretend that what happens at this farm won’t have an impact anywhere on the surrounding area. Water is something EVERYONE needs to live. The DNR has already started an expansion of this farm and, in my opinion, this expansion is likely to impact several waterways within the area. The water in Winona county has already been tainted and in many places, not safe for consumption. This greatly expanded farm would most likely be long term and add to the demand on our water resources. It is a very important issue for our community and I urge the MPCA to actively consider the environmental impact this expansion will have. Lynne Lanyard

347 Dear MPIC, I am truly concerned about the proposed addition to the Daley farm. Having grown up on a dairy farm I know how much manure even a small to medium herd of cows makes in a day or week or month. To say yes to more than doubling the size of this farm is not being responsible to the citizens of the county. The geology of Karst country does not lend itself well to dealing with manure from around 5 000 cows. The water table in Winona is already over saturated with nitrogen. The MPCAapproved the proposal in 1998 when they said the effects of water contamination from this amount of animals is too great of a risk to run. An Environmental Assessment Worksheet does not adequately address all the concerns we citizens have about the possible contamination of water in the area and beyond and also the amount of water that would be necessary to run a herd of this size. I ask that the MPCA listen more closely to the concerns of many of us who value excellent water quality in our state and beyond. At the very least an environmental impact statement needs to be done. I must say that I oppose issuing a permit to Daley Farms to expand because to do so is a risk too big to take for reasons I stated above and reasons stated by others who are also concerned and opposed to this expansion. Sincerely, Karen Neenan

348 It’s always been a pleasure working with the Daley farms. They do a great job and their farm is very well kept. They have a great manure system for containing it and applying it to their fields. I fully support any and all expansions they would like to do with their farms.

349 On October 16th, 2018, I attended a public information meeting on this matter in Lewiston, MN. After listening to many verbal comments from the audience, it became clear that there was a group present that was organized to shut this project down no matter what the facts were. This group is well organized, very radical and very focused on shutting certain projects down. Historically, the tire burning project in Preston MN, ethanol plant Eyota, MN, sand ban Winona County, etc. Please make sure your decision are on the facts and not on pressure from a special interest group.

350 I fully support the feedlot expansion for Daley Farm of Lewiston. They have big farms and are pride in everything they do. It certainly would be the goal for them to do things even better in the future.
392 Winona County has traditionally been an area with a rich tradition of dairy farming. The Daley Farm project represents an evolution of that tradition and has my support. Winona County has a large percentage of its cropland classified as Highly Erodible. It is important to maintain alfalfa acreage in the area to prevent soil erosion and nutrient runoff. This project would require a significant increase in alfalfa acres which would help maintain this valuable resource.

393 The Daley Farm request has potential for significant environmental impact. My particular concerns are water quality and environmental degradation. The Daley Farm is 1 mile from the City of Lewiston, MN. An EIS must be done to research and examine how the proposed water usage and potential for water contamination (see MN Dep't of Ag 2016 water testing report showing 46.1% of wells contaminated by nitrates in Utica township) affects the City of Lewiston's Wellhead Protection Plan (WHP). The City of Lewiston's Comprehensive Plan requires them to be proactive about possible water related complications and expenses with the new operations. The WHPA was recently changed the previous WHPA previously did not include the Daley Farm. An EIS should examine why this change occurred and the ramifications of this change on the City of Lewiston's drinking water.

404 RE: Proposed Daley Farms expansion. Because the Daley Farms has high potential for significant environmental impact, I am accepting all environmental review including an Environmental Impact Statement (EIS) for the Daley Farms proposed mega-dairy expansion. Concentrated large industrial animal operations can cause a myriad of environmental and public health problems. Extensive scientific evidence exists documenting the harmful impact that concentrated large animal operations have on ground water, surface water, air quality, odors, greenhouse gas and climate change, insect vectors, and pathogens that. (CDC, I have outlined a few points in support of my request: Environmental Concerns 1) The Daley Farms operation poses high potential for harmful environmental impact due to its scope and level of animal intensity and from agricultural practices associated with concentrated large animal operations: a. Manure pollutant. Manure from concentrated large industrial animal operations contains a variety of potential contaminants. It can contain plant nutrients such as nitrogen and phosphorus, pathogens such as E. coli, growth hormones, antibiotics, chemicals used as additives to the manure or to clean up animal waste, animal blood, silage leachate from corn, or copper sulfate used in footbaths for cows. https://www.cdc.gov/nceh/ehs/docs/understanding_cafos_nalboh.pdf b. Volume of manure generated. The expanded operation would generate around 46-million gallons of manure each year. The manure application sites include several fields that are within Utica’s drinking water supply management area – an area where ground water contamination could affect Utica’s drinking water. There are many sinkholes in the area; manure application is prohibited within 50 feet of a sinkhole. Other fields are close to wells or intermittent groundwaters in the region already have high nitrate levels, and allowing more livestock manure to be applied to more fields may well worsen the current significant risk to water quality in those streams. Groundwaters in the region already have high nitrate levels, and allowing more livestock manure to be applied to more fields may well worsen the current significant risk to water quality in those streams.

395 This expansion is on the Daley Farms’ Proposed Mega-Dairy Expansion. I am familiar with SE Minnesota's karst area having lived there for a time and with relatives who farmed in that part of the State. The Daley expansion in this sinkhole area with its limestone that is slowly dissolved by rainwater and creating hidden pathways from pollutant points to drinking water wells or surface water. Agricultural spills can cause fish kills many miles from the spill or leak. Their proposal calls for over 40 million gallons of manure annually. Well tests by the Minnesota Department of Agriculture in 2016 showed 46.3 percent of the wells tested in Utica exceeded the safe drinking water standard for nitrates. The expansion of the Daly dairy to over 4500 cows in this karst area is a potential environmental disaster of such proportion that it could make area underground for humans miserable. Winona County’s ordinance is clear: no feedlot over 1500 animals, and this was passed in 1998. The Daley farm was larger than 1500 at the time and was grandfathered in, which means it could continue but could not expand (increase in size not in conformity). It seems this expansion is such a hazardous threat to the beautiful land with its rolling hills, small farms and valleys. Please shutdown this plan.

396 Resident in Lewiston. I’m confident that the Daley’s will do everything in their power to ensure the quality of the land, water, and air meets or exceeds MPCA standards. They have been doing this for many years and are only getting better by adding upgrading systems and technology that have been put in place and are being practiced to ensure the quality and safety of every day farming. Daley’s are very unique in the way they are still family owned, and are trying to enlarge and ensure that all family members have a opportunity to become good stewards of the land. Because they have been using technology by becoming more efficient and using less inputs, they have been willing to change for the good of the land and community. Let’s allow them to change positively, this will ensure that 50, 100 years from now, future farmers know how to effectively and efficiently remain viable with positive change. Thanks, Charlie Matzke

397 I am deeply concerned about the proposed expansion of the Daley Farms Dairy operation near Lewiston. As an aquatic ecologist with 30 years assessing aquatic health in the streams of southeastern Minnesota I have been intimately aware of the fragile nature of our region’s waterways. Concerns for impacts of land use changes on our streams, from the deterioration of stream habitats to the outright loss of populations of fish and their prey organisms. Cold, high-quality water emanating from springs is the foundation of our region’s trout streams, and protecting that water, both on the surface and underground, is paramount. I fear that the proposed dairy expansion in the headwaters area for both the Whitewater River and Rush Creek would create such significant risk to water quality in those streams. Groundwaters in the region already have high nitrate levels, and allowing more livestock manure to be applied to more fields may well worsen the current situation. The region also has experienced an increased frequency of heavy precipitation events with their consequent flooding, which can carry manure from fields to streams in rapid fashion. I ask that a
I am very concerned about groundwater pollution. When I moved from the Chicago area to Southeast Minnesota in the early 1980’s I quickly learned about how the karst geology here creates a connection from surface water to groundwater. I know that nitrates, pesticides, and other harmful materials are now leaching up in larger and larger amounts and in our drinking water. I now have expensive filters on all my drinking water. I have lived in various locations in Olmsted and Wabasha Counties. I have noticed how the shallow wells have increased nitrate levels. Where I currently live, I need to have a new well drilled to avoid drinking water from a sandpoint well that had over 5 ppm nitrate. The new well still came in with over 1 ppm nitrate and is now testing closer to 2 ppm. With the more recent concern about pesticides in our groundwater I am getting even more anxious about the safety of the drinking water. At this point, I think the MPCA is not paying enough attention towards our concerns about the impacts of pesticides in our drinking water.

I am not a biologist but I am an engineer and I just can’t seem to resolve the following. Why is human waste treated so carefully compared to animal waste? Animal waste can be spread all over the ground where rain can wash it into karst features and streams? Only when human waste is fully decomposed by bacteria can it be spread on farm fields. Why can animal waste be spread on farm fields without significant pre-treatment? And while it is breaking down on the ground it can be washed into streams where I can encounter karst features that allow it to flow underground. I think that the MPCA is not being thorough in their evaluation of the proposed human waste treatment projects in the state. I would like to know the impact of these drainage systems on the local streams and the groundwater. Please follow the information linked below on how liquefied manure finds its way into the drains and streams.


I am a trout fisherman. I am aware of the huge amounts of money from the Clean Water fund that is being spent without any scientific basis about the impacts of this on our water quality. The DNR supports environmental improvement while the counties and the MPCA are clearly backpedaling when approached by a private business. Where does the buck stop? Hopefully it stops at least in this state since I would clearly not want the federal government to be involved in a matter so sensitive to this state. I do understand how Daley is “grandfather-ed in” to have the current number of animal units. But how can the Mn DNR support environmental improvement while the counties and the MPCA are clearly backpedaling when approached by a private business? The Rush Creek watershed is vulnerable to surface pollution and I think expanding the Dairy is too risky.

Currently the.feed lots are at the 1. Daley Farms currently have two wells at the Project Site that draw approximately 88,000 gallons per day or approximately 32 MG of water annually. These wells supply water to the Project Site for drinking water for livestock, cleaning, sprinkler systems for cooling the feed lots, and to wash down the feed lots. The Project Site is estimated to use 70,000 gallons per day or approximately 24.3 MG of water annually. In total, Daley estimates 92 MG of water annually. The DNR has “determined that the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands.” 2. A 300 foot deep domestic (home water supply) well is located .26 miles from the site of the proposed wells. The City of Lewiston Wellhead Protection Area is located .30 miles from the site of the proposed wells. 3. The building site is adjacent to a sinkhole. Since the proposed wells are to be placed at a higher grade level, what is the plan if there is an overflow? 4. The Mn DNR estimated that the project will result in total water use of approximately 14.5 MG per year. This estimate does not take into account the fact that the proposed project is expected to increase by 20% the amount of water used by the project. The Mn DNR also estimated that the project will result in total water use of approximately 14.5 MG per year. This estimate does not take into account the fact that the proposed project is expected to increase by 20% the amount of water used by the project.

I think expanding the Dairy is too risky.

I am a Trout Angler from Rushford, MN. I am very concerned about groundwater quality. The Rush Creek Watershed has the Potential of a Fish Kill on these Water Sheds. The proposed Daley Project has the POTENTIAL of a FISH KILL on THESE WATER SHEDS. OVER THE YEARS THERE HAVE BEEN SEVERAL FISH KILLS ON S.E. MN. TROUT STREAMS. AT THE VERY LEAST THERE SHOULD A DISCLOSURE IF THIS PROPOSAL IS IN AP PROPOSAL EXPANSION BECAUSE OF THESE REASONS. THANK YOU. MIKE JENSEN
I would be one of the last people to oppose anyone's right to try to better themselves, but in this case the likelihood of disaster lurks just under the surface. Trying to contain that much manure in karst topography as we have here is not a matter of if, but when the system will breach. The quality of life in the area will be forever changed in many ways when it does. If I somehow have a say in this I would vote against it. Thank you.

Greetings, I am trained as an aquatic biologist and have centered much of my work on the groundwater-fed streams of southeastern Minnesota. Part of what has kept these streams - which are an iconic resource of the Driftless Area - healthy and thriving in recent history has been responsible land use, including the limited scale of farms in this region of the state. Opening up this area to CAFOs, or Confined Animal Feeding Operations, in the midst of a developing karst geology system that is going to threaten the biotic integrity of our soil, water streams, CAFOs, and the health of farm workers and nearby residents. The Daley feedlot expansion is said to aim toward 6,000 cows, which demands the disposal of 46 million gallons of raw cow manure per year. This is just a single farm. What happens next? This large herd size will create nutrient buildup at the farm, which becomes a liability and threat to environmental quality. Excess nutrients in soil can contaminate water resources, killing aquatic life, and causing waterborne diseases in humans. To comply with the Clean Water Act, CAFOs are required to implement comprehensive nutrient management plans to make sure they are not exceeding the nutrient concentration beyond the soil carrying capacity. Our karst topography in southeastern Minnesota has limited capacity to buffer excessive nutrients. In fact, nitrogen levels in a majority of water wells in the area already exceed the safe limits for consumption. Our geology is not equipped to process this. Southeast Minnesota is an amazing place where small scale farms can co-exist with healthy, productive streams - which provide (priceless) aesthetic and cultural values, and an economic impact through sport fishing/recreation that, across the entire Driftless Area, adds up to billions of dollars per year. Allowing one farm to obliterate established limits on the number of animals sets a dangerous precedent. In the last few years, Winona has truly turned a corner in terms of becoming a community that boasts unparalleled pride, appreciation, opportunity, and engagement in the arts, education, recreation, and incredible natural resources. Please help us build and grow this legacy by protecting the vital, shared resources.

At a minimum, an EIS should be performed. While the full impact of increasing the herd by 268% cannot be fully known, there are many reasons for concern. • The volume of manure generated on this plot of land is unprecedented in the fragile driftless region with its karst geology. • Nitrogen and coliform bacteria will end up in the aquifer, probably moving miles from the Daley property. Consider the underground river flowing through lower level of the Mystery Cave. Water quality in area wells and streams will be degraded. • Nutrients delivered to the Whitewater River and Rush Creek watersheds will alter the plant and animal communities in ways that cannot be accurately predicted. Algae blooms and fish kills are possible. • Failure of the manure storage system is likely at some topography. The topography of the driftless region predisposes us to flash floods. The frequency of big rain events has increased by 37% in the last 20 years related to climate change (Nicholas, et al. Science). Engineering and Medicine publications have shown it takes 16 inches of rain 24 hours. It is unlikely that manure storage systems are designed with this future in mind. • Failure of the manure storage system will put gallons of manure into the Whiitewater and Rush Creek watersheds, resulting in major fish kills. • A sinkhole could develop beneath a manure storage facility, dumping thousands of gallons of manure into the aquifer. There is a history of sinkholes opening up beneath sewage treatment ponds in our area, once in Lewiston and twice in Altura. The Daley family is highly regarded. By all accounts they are fine people and good neighbors. But putting 4,628 animals on this plot of land in Southeast Minnesota is a truly bad idea and should be rejected. Charles A. Shepard, MD President, WinCres Chapter, Trout Unlimited

No phase permit will be issued for varying reasons for concern. • The volume of manure generated on this plot of land is unprecedented in the fragile driftless region with its karst geology. • Nitrogen and coliform bacteria will end up in the aquifer, probably moving miles from the Daley property. Consider the underground river flowing through lower level of the Mystery Cave. Water quality in area wells and streams will be degraded. • Nutrients delivered to the Whitewater River and Rush Creek watersheds will alter the plant and animal communities in ways that cannot be accurately predicted. Algae blooms and fish kills are possible. • Failure of the manure storage system is likely at some topography. The topography of the driftless region predisposes us to flash floods. The frequency of big rain events has increased by 37% in the last 20 years related to climate change (Nicholas, et al. Science). Engineering and Medicine publications have shown it takes 16 inches of rain 24 hours. It is unlikely that manure storage systems are designed with this future in mind. • Failure of the manure storage system will put gallons of manure into the Whiitewater and Rush Creek watersheds, resulting in major fish kills. • A sinkhole could develop beneath a manure storage facility, dumping thousands of gallons of manure into the aquifer. There is a history of sinkholes opening up beneath sewage treatment ponds in our area, once in Lewiston and twice in Altura. The Daley family is highly regarded. By all accounts they are fine people and good neighbors. But putting 4,628 animals on this plot of land in Southeast Minnesota is a truly bad idea and should be rejected. Charles A. Shepard, MD President, WinCres Chapter, Trout Unlimited

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I am in favor of the proposed expansion at Daley Farm of Lewiston. Great community support with a great reputation of taking care of the environment.
4 We would like to echo the concerns expressed by Loni Kemp. Loni is an expert on these issues: she was on the MPCA staff and the Citizens Board in years past, led Fillmore county’s committee to create its first Comprehensive Water Plan and had a 40 year career in agriculture and environmental policy analysis. Loni also worked nationally on feedlots and regulations, and helped pass Minnesota’s Groundwater Protection Act. Please accept these comments and order an EIS. 1. The EAW does not sufficiently address the precise nature of karst features that would impact the dairy facility dairy or manure deposition areas. The manure storage basins are larger than any built before in this region. The EAW does not discuss if the manure will be the storage basin is naturally drained or require a pump. Daley’s proposal to raise their dairy feedlot numbers from its current 3,275 animal units to 5,000 animal units (a 49% increase) makes it absolutely clear that the MPCA must conduct an EIS to address multiple concerns about the impacts of the proposal on environmental and human health. Daley Farms, the largest animal unit feedlot in Winona County & one of the largest in the state, was grandfathered-in as a non-conforming feedlot when the 1998 County feedlot ordinance was adopted to limit feedlot size to 1,500 animal units. Daley’s proposal to raise their dairy feedlot numbers from its current 3,275 animal units to 5,000 animal units (a 49% increase) does not comply with County ordinances. The County, in its wisdom, clearly understood the risk of large animal feedlots and porous soils that are the potential for catastrophic pollution of our water resources. This situation clearly requires a far more detailed analysis of the project. The MPCA has an obligation to use the EIS to dig deep into the new conditions and forecasts to prevent the unforeseen and unintended consequences of this proposal. Wells: The project proposes to use 92 million gallons of water per year for the Feedpad run-off basins around the barn [will] collect, filter and discharge. What specific measures will be taken to ensure that storm water runoff from the 8.34 acres of impervious surface is handled correctly? Feedpad runoff basins – p. 5 – no specific BMP are mentioned in how the “permanent stormwater management regulations in the world. We need to trust the experts and the regulators to do their work and to allow this opera
other farmers are monitored for accurate agronomic rates? Air Quality: The AERMOD model used to determine the human health impacts has significant deficiencies in predicting accurately the air quality consequences of this proposed dairy expansion & the cumulative impacts of this feedlot and the surrounding 13 feedlots that were included in the Air Quality Monitoring Report, Attachment T. Why? Because the AERMOD modeling program has no real data to use to calibrate the model. Please note: from your agency’s own report - "Modeling of the statewide screening of human health risk from Air Pollution Prepared by Minnesota Pollution Control Agency staff: Kristie Ellickson, Ph.D. Doris Kwan, Ph.D. Gregory C. Pratt, Ph.D." “Given information on the modeling system, it is impossible to validate model predictions against measurements (my emphasis) to evaluate how well the model is performing and how accurate and trustworthy are the model results. Comparison of modeled values with measurements is a fundamental step in assessing the performance of a model for a given application. A dispersion model that is prepared in the absence of monitoring data for calibration is subject to significant (and even unknowable) uncertainty.” The Air Modeling Report for Daley Farms was prepared to aid decision making in this project. Obviously an EIS is necessary to eliminate any uncertainties in the concentrations of emissions of hydrogen sulfide and ammonia, as well as the potential for serious odor problems from a feedlot of over 6,000 dairy cattle, heifers & calves. I believe that the MPCA has many reasons to order an EIS for this project. It has the authority and the obligation to protect the citizens of Winona County and the other rural counties in our state to ensure that the proposals for mega-feedlots are examined closely. Our rural communities must not be overwhelmed by the problems inherent in this kind of project. Whether it’s 10 feedlots in Fillmore County, 3 feedlots in Winona County, the MPCA is obligated to order an EIS for this project.

417 I offer the following comments, in addition to those I submitted on October 31, 2018, regarding Daley Farms of Lewiston LLP proposed dairy expansion. As I stated at that time, it is obvious from a review of the Environment Assessment Worksheet that an Environmental Impact Statement must be conducted to address numerous questions about the environmental and human health impacts of the Daley farm's proposed expansion. A detailed review of the EAW shows that the EAW: 1) contains information that is inconsistent with information found in the Daley’s draft permit; and 2) is incomplete in numerous instances, including greenhouse gas emissions, traffic safety impact, water availability and impacts on nearby municipal and private wells, and projected high dairy animal mortality rates; The EAW reaches a number of unsubstantiated conclusions and uses terminology, such as the word “will,” and the phrase “once approved,” which indicate pre-determined outcomes. The EAW contains no life-cycle analysis for the proposed project; does not address TMDL’s that already exist in the 2 affected watersheds; and does not include or address information from the Minnesota Department of Agriculture showing that approximately 20% of dairy cattle in Minnesota have been treated with antibiotics, including antibiotic resistant bacteria, related to Daley’s animal health practices and inputs? These questions must be answered in the EIS. p. 18. It is estimated that the average mortality rate will be 2% for the project; What is the projected mortality rate for dairy farms in Minnesota? Why is the projected mortality rate so high? What drugs are administered to attempt to keep animals alive, and does the facility’s manure or milk contain drug residues, including antibiotics? What are the environmental and human health impacts of antibiotic residues and resistant antibiotic bacteria, related to Daley’s animal health practices and inputs? These questions must be answered in the EIS. u. Page 18 states that stormwater runoff will flow into the Whitewater River and Rush Creek, both of which are designated trout streams. The EAW contains no analysis of the proposed expansion’s impact on water quality. water temperature, the turbidity, sediment load, and nutrients, pathogen and pesticide contaminants in affected trout streams. This must be answered in the EIS. v. What volume of rainfall would cause the manure basin to overflow, if it is at 90% capacity when the rainfall begins? w. The traffic impact discussion on page 20 is wholly inadequate. It mentions “12 vehicles per day” during construction, and then “269 vehicles per week” for operation. Are those round trips? How many trips in and out will each vehicle make per day or per week? The discussion does not include crop production vehicles, manure removal equipment, or veterinarian traffic. There is no analysis of the impact on traffic safety on Hwy 14 and the other highways heavily used with nutrien this accidents and fatalities. X. Page 21 discusses the proposal for additional feedlots on other feedlots in the county, but does not contain data on the number of animal units already in the county. How would the project impact the number of animal units in Utica Township? How many animal units in Utica Township would be located at the Daley operation? How many AUs are in the two sub-watersheds? y. The draft permit would allow “process wastewater” to be added to the manure basin. What contaminants are found in process waste water? Chlorine? Acids? Detergents? Antibiotics? Chlorohexidine? Barn pesticides? When land applied, how do these compounds impact soil organisms? Do they leach into the groundwater? Do they contaminate drinking water supplies?
Calls many of the MPAC’s project outcomes into question. Further, neither document contains information on the existing amount of land with imperious surfaces at the Daley sites. The draft permit indicates that feedpad runoff will not go into the manure basin, but the EAW (page 12) shows a portion of the feedpad runoff going into the manure basin. 2) Incomplete analysis a. The EAW contains no analysis of the feed requirements for 6107.7 AU, when the animals are managed in CAFOs, as planned. How much grain would be required to feed 6107.7 AU annually? Does the projected land base of 2,381 acres owned by Daleys, or the 4,083 acres available for manure application, equal or exceed the number of acres needed to produce the amount of grain for feeding 6,107.7 new animal units to Winona County (EAW, page 4) states, “Eliminating the LLP from the SSE site will increase the risk of nonconformance.” There is no guidance on the proponent to restate on page 12. Nowhere does the EAW mention that Winona County’s ordinance states, “11.14.11.1a No such use shall be expanded, changed, enlarged, or altered in a way that increases its nonconformity.” The Daley Farms’ proposed expansion would clearly violate Winona County’s ordinance and does not qualify for a variance. c. On page 7, the EAW indicates that the proposed project is not subject to a “local comprehensive plan.” This is untrue. Winona County adopted a Comprehensive Plan in 2014 and the proposed project is subject to that plan. The plan can be found at: https://www.winonawcd.org/Winona_Final%20Summary_05_16_18.pdf These levels of contamination are occurring with current animal unit numbers and farming practices. The impacts on private water well drinking water safety must be fully explored in an EIS, along with an analysis of the effectiveness of efforts to reverse groundwater contamination, and the potential impact of adding 3832.7 confined AU’s in an area with extremely high levels of contaminated wells. g. Page 5 states that the manure storage capacity would expand from 22,000G to 35,660G, despite the fact that the number of animal units would more than double. This capacity is not feasible. The size of a manure storage needs to be large enough in order to have more than two months of storage in order to be able to deal with large rain events with resulting pollution of streams and groundwater. I hope that the proponent to restate the information from page 7’s list of “nearby resources” does not mention sinkholes, caves and other unique Karst features, which are found throughout the county, including in Utica Township. This box was not checked in the EAW, related to Karst features must be addressed in an EIS. I on page 9, the discussion of threatened and endangered species focuses on the dairy sites, and does not mention impacts in the numerous manure application sites. In addition, the assessment does not mention insect species, such as Laron’s Black Butterfly, amphibians, and reptiles. The draft permit page 7 includes a list of flora and fauna species which must be done in an EIS. I on page 9, Figure 3A shows the groundwater depth at the construction site is to be 16 feet, but at the manure application sites, it is 2 feet. The depth to bedrock is shown as 42 feet at construction site, but less than 10 feet in the application sites. First, less than 10 feet is a number – it is an estimate. Second, the construction site is found in the same geologic region as the manure application site, and no reason is for the huge difference in depths. Third, the value is very high. All of these issues must be addressed in an EIS. k. Page 10 shows that there are 20 manure application sites with mapped sinkholes and 27 sites with shallow bedrock soils, all of which provide direct conduits to aquifers. There is a discussion of planned strategies to minimize groundwater contamination, with no scientific assessment to determine the effectiveness of these planned actions. This is totally inadequate. I. Nowhere in the EAW or the draft permit is the depth of manure injection discussed. What is the planned depth? Will it be in the zone of biological activity? Or, will nitrates, pesticides and antibiotics be provided direct access to aquifers? I discuss in EIS. l. Page 11 contains a discussion of planned water usage, but there is no information on the water used for drinking, irrigation, livestock or municipal purposes? n. Page 11 says the DNR “has determined that the proposed rate and volume may interfere with other water uses or have negative impacts on nearby lakes, streams or wetlands.” This is a huge concern, yet the EAW does not contain a discussion of the impacts identified by the DNR. This must be addressed in EIS.

419 I live in Fillmore county on a family farm near Winona County and have friends and family this will be negatively affected by this project. Please accept these comments and order a EIS. The level of ground water recharge by the facility is huge and can contribute failure of the manure pit. Exist nitrate levels of communities near Winona County are already near or exceed the maximum allowable level of 10 mg/L. The level of extension will affect the volume of well water available to rural residences, farms and communities. This one dairy proposal will take nearly three times the amount of ground water at nearby farms. Massive water withdrawal rates will change the karst groundwater system increasing the risk of system failures. An responsible emergency response plan would be impossible to carry out effectively. With history of three community sewage ponds which was a failure of having a massive manure pit fail is far too great to risk a take. Many cattle at the drop of a hat. Those cattle would not only have to be relocated, fed, watered and cared for, let alone be milked a minimum of twice a day. There is no facility that would have to take that on in a sudden emergency situation. And that is just the facilities. What about the people that could have to go. They can’t do that up. Even if you go with it. It can’t be dealt with in a timely manner to prevent significant harm to ground water, environment and citizens. Likely it would be shrugged off and deemed as an act of god, which is not an acceptable excuse to me. A disaster from a facility like this is preventable, they should never be allowed to get this large especially on Karst land !! Once ground water is contaminated there is no easy fix it will effect us for eternity. We the people that can be negatively affected by this in so many ways deserve a full EIS at the bare minimum. No shortcuts!! Carol Thompson 44741 Co 18 Mabel MN 55954 507-493-5164

420 Please see attached comments from Minnesota Wells Owners Organization
The project is likely to have significant environmental effects, especially on the quality of aquifers and surface waters, as well as the trout and other aquatic organisms which are present in the area. The proposed project is not adequately examined for its impacts on these resources. I support their proposed dairy expansion project. For this reason we respectfully request that the MPCA order an EIS be prepared for this project. Respectfully submitted, John P. Lenczewski, Executive Director Minnesota Trout Federation.
manure pack. For more information about flooding and the environmental problems it can create, visit the MPCA’s Floods: Minimizing pollution and health risks webpage. The webpage includes a factsheet specifically for livestock producers titled Managing manure storage and land application during adverse weather conditions. And this from the Minnesota EQB regarding the 2025 goals: “All drinking water in the southeast region comes from groundwater. Southeast Minnesota is especially vulnerable to groundwater contamination. Karst topography means this region needs to take extra steps to protect drinking water supplies from nitrate, bacteria, pesticides, and fertilizers.” And this project alone is said to need 92 million gallons of water a year. What might this do to the neighboring wells? What would the impact be on the aquifer? An EIS would answer these questions. 3. Real Estate Values. I’ve attached a study called, “An Analysis of the Impact of Swine CAFOs on the Value of Nearby Houses”. Dated 2008, this study was done by Hans R. Isakson, Department of Economics and Mark D. Ecker, Department of Mathematics, both from the University of Northern Iowa. We need an EIS so that we can look at the potential effects on real estate values in Lewiston. 4. Roads. What about the added stress on the roads due to the uptick in traffic because of the expansion? The added financial burden for the upkeep, and will this result in added taxes for the residents? An EIS would tell the whole story. 5. Residents’ Health. We have all heard of the respiratory effects, especially, of living (and working in) the vicinity of a project as large as the Daley’s expansion. An EIS could look at the risks to people’s health. This is to say nothing of the impacts on nearby community organizations such as churches, temples, synagogues, community centers, and schools, as well as quality of life issues. An EIS would be looking into all of these sorts of potential hardships. The mission of the MPCA is to protect and improve the environment and human health. There are enough risks here that must warrant an EIS; we need to know more. Thank you, again, for your consideration. Michelle J. Hockersmith 41360 County Road 18 Mabel, MN 55954 563.419.0990  507.493.5562
Attachments to Comment 271.
Attachment to Comment 313:

Daley Farm Expansion

First of all I want to say I am 100% in favor of this expansion. With that being said; it amazes me with so many intelligent and educated people in Winona County that there is so much confusion regarding this expansion. SO many are concerned about the quality of the water. Do you actually think that that issue is not a concern for this family too? They drink and use these waters too. They have families living on all these farms; sons, daughters, grandchildren, great grandchildren, can you not relate to the fact that they have spent much time, energy and money into the investigation of this issue to protect their own? They do not have a "hidden" water supply of their own to use, they use the SAME water as all the rest of us county residents.

As we all know, many smaller farmers & dairy operations have had to sell out and that is sad; but there are many families that do not have children, grandchildren that are interested in continuing the Family Farm. They are either not interested in farming or cannot see themselves putting in those long hard hours that go with being a successful Family Farm. Farming and managing a dairy herd is not all fun and games, there is much hard, dirty work, long hours, and frustrations, government hurdles that they have to make sure they are abiding with and this will go on forever. The generations that are trying to make this Family Farm prosper and be able to continue to provide a living for years to come all know what it takes to make it work. They all have grown up working on the Family Farm working there as soon as they were old enough to work there, they have gone on to college to learn and stay knowledgeable about the future of the Family Farm and learn the new, better, safer, etc., ways to run a Family Farm. They are committed to what they are doing to keeping their farm alive and they are doing so in a manner that is open to all the world to see and learn about. Many people do not have any idea as to what they have all done to improve and meet governmental regulations. I say YES to the Daley Farm Expansion.
Federal agency rules in favor of farm workers in labor dispute

(2/24/2013)

by Chris Rogers

A Lewiston dairy farm has been ordered to pay $86,385 in unpaid wages and damages following an appellate court ruling stating that the farm violated state labor laws. Daley Farms refused to pay 46 employees over $43,000 in overtime wages. Another area farm, Hader Farms, of Zumbrota, agreed to $17,633 in back wages in a recent settlement with the Minnesota Department of Labor and Industry (DLI).

The July 2012 court ruling ended a six-year legal battle between Daley Farms and the DLI. The appellate court's decision clarifies and perhaps changes how Minnesota labor laws apply on the farm.

Daley Farms is a well-respected name in local agriculture. It hosted the Winona Chamber of Commerce Night on the Farm in 2009 and in June 2012—a month before the appellate court decision. Land Stewardship Project spokeswoman Barb Nelson said the folks at the Daley Farm are good people. "Everybody looks up to them," she said.

But in 2006, Daley Farms received an order of compliance from the DLI, telling it that it had to pay its workers overtime. Presumably, employee complaints alerted the DLI to the situation. Daley Farms appealed the order.

At the heart of the farm's objection was whether its workers met an exception to the state overtime requirement. Under the Minnesota Fair Labor Standards Act (MFLSA) farm workers must be paid time-and-a-half after 48 hours of work in a week, unless they earn a weekly salary greater than the wages for 48 hours at minimum wage plus 17 hours of overtime. According to the appellate court decision, Daley Farms argued that its workers did earn more than that and thus fit the exception. The DLI maintained the exception did not apply because the workers were paid by the hour, not through a salary agreement.

Daley Farms challenged the DLI orders through various channels over the next five plus years. At one point it seemed like the farm might prevail.

In 2008, an Administrative Law Judge recommended the DLI stand down, because of a 2006 case in which state courts ruled the exception did apply to an hourly laborer whose earnings exceeded the salary threshold.

However, the DLI was unwavering. It dismissed the recommendation and issued a final order to Daley Farms to pay back wages plus damages.
Daley Farms appealed that order with the state appellate court. However, when the court reached its decision last July, it backed the DLI.

In the 2012 decision the court held that the 2006 case did not constitute a legal precedent because the court was "not presented with the question of whether the exemption is limited [by the DLI's regulatory power] to employees paid on a salaried basis." The court also ruled, that although federal labor laws do not require farm workers to be paid overtime, farms must follow Minnesota laws which do.

DLI Commissioner Ken Peterson said there is a misconception among farmers that the federal overtime exemption for agricultural laborers supersedes state law.

"To some extent I think that Daley Farms was trying to test that whole question," Peterson continued. "That is why they litigated it. And I don't blame them for that. They are making sure we are enforcing the law correctly. At the same time, I think we were right from the beginning."

Organizations: labor violations are a big problem in Minnesota agriculture

The Daley Farms case made recent news because of a report issued by the Land Stewardship Project (LSP), Central Campesino, and the Latino Economic Development Center (LEDC)—advocates for sustainable agriculture, Latino and migrant farmworkers, and Latino-owned business, respectively. The report outlines the two cases, which had largely escaped the public eye, and labor law violations the organizations say are a widespread problem in Minnesota, especially among illegal immigrants.

While the DLI said that immigration status is not something that it checks, and therefore could not say if the workers at Daley Farms were illegal immigrants, the content of the LSP, LEDC, and Central Campesino's report and the fact that the DLI brought up the Daley Farms and Hader Farms cases during a discussion of alleged labor abuses against illegal immigrants with the three organizations, raises the question.

In any case, according to the organizations, there are other cases of labor violations against illegal immigrants. The organizations say they have documented cases of "failure to provide a final paycheck after an employee's resignation or dismissal," "failure to pay for all hours worked," "dock of worker wages for damage to farm equipment or buildings," and "failure to inform injured workers of their rights to workers' compensation."

Central Campesino has received reports of abuses like this for years, Executive Director Ernesto Velez Bustos said in the report. "This is wage theft."

Yolanda Cotterall, spokeswoman for the LEDC, said that labor abuse among undocumented workers is a wide spread issue in Minnesota. While her organization is not meant to take reports of labor abuse, the stories keep coming.

LSP spokeswoman Barb Nelson also said that labor law violations against illegal immigrants is a
widespread problem in Southeastern Minnesota. She has heard several complaints personally, she said. She spoke highly of Daley Farms, and said that if labor violations occurred there, they are "absolutely" occurring elsewhere.

"It's a farmer's responsibility to understand labor laws," she added. "I'm not really compassionate for people who violate them."

Being poor and being an illegal immigrant are both factors which make people vulnerable to labor violations, Cotterall said. And farm workers are disposable, she added. "People are lined up for these jobs in rural communities."

"Undocumented workers hesitate to say anything for fear of deportation," Nelson said.

"Imagine a workforce that has no voice," Cotterall said. "How do you make sure that they are treated justly if they don't speak?"

DLI Commissioner Ken Peterson admitted that the fear of deportation creates a "chilling effect" for would-be reporters of labor law violations, though the DLI protects the anonymity of complainants.

The LSP has asked the University of Minnesota to better promote education for producers on labor laws, to educate workers of their rights (including posting information in workers' native language on the farm), and to research the issue of labor violations and the treatment of immigrant workers.

Farm Bureau: violations are not the norm

"Hispanic labor is an important part of agriculture in Winona County. How many are legally here or not—that is unknown," Winona County Farm Bureau President Glen Groth said. Farmers are not allowed to question workers' immigration status beyond asking for a social security card. "Often times farmers have no way of knowing, until the government sends them back," he said. "That is why some kind of immigration reform is so desperately needed for our industry."

Hispanic labor is important, he said, because farmers cannot find enough local people willing to do the work, even for 10 or 12 dollars an hour wages. Conversely, "A lot of the immigrant labor see it as an opportunity," Groth said. "They are here to work long hours."

Groth said that all of the people he knows pay their workers overtime and offer wages well above minimum wage.

Area farm owners "don't treat these people like dirt," he said. "They treat them like family." Farmers know they cannot operate their farms without good help, and many immigrant workers "move into management positions, and become an integral part of the operation," Groth said.

Nelson concurred that she knew of employers who help their immigrant workers as if they were family. "The saddest part of the whole thing is that the violators give everyone a bad name," she
said. "People will start to think that everyone who hires Hispanic workers are treating them badly."

"Employers are doing what they need to do to. To say that abuse is widespread is an error and not representing the reality of the situation," Groth said.

Groth added that he would like to see Minnesota labor laws match federal laws, and that the Farm Bureau has considered lobbying for the removal of the state overtime requirements for hourly agricultural laborers. "I think it makes a lot of sense," he said. "The nature of agriculture is that it is seasonal and the work week doesn't always stop at 48 hours. A lot of farms are willing to pay their workers more to have good people on hand when they need them."

Winona Chamber of Commerce President Della Schmidt expressed concerns that complying with stricter labor laws may put Minnesota farms at a disadvantage. "When farms on the other side of state lines have more agribusiness-friendly policies, that is concerning for us."

A recent proposal in the state senate would increase minimum wage and overtime requirements for a variety of businesses including agriculture (see story).
Winona County: Final Overview of Nitrate Levels in Private Wells (2016-2017)

The Minnesota Department of Agriculture (MDA) determines current nitrate-nitrogen concentrations in private wells, on a township scale, through the Township Testing Program. The MDA has identified townships throughout the state that are vulnerable to groundwater contamination and have significant row crop production. The MDA plans to offer nitrate testing to more than 70,000 private well owners in over 300 townships by 2019.

Each selected township is offered testing in two steps, the “initial” sampling and the “follow-up” sampling. In the initial sampling, all township homeowners using private wells are sent a nitrate test kit. If nitrate is detected in their initial sample, the homeowner is offered a follow-up nitrate test, pesticide test and well site visit. Trained MDA staff visit willing homeowners to resample the well and then conduct a site assessment. The assessment helps to identify possible non-fertilizer sources of nitrate and to see the condition of the well. A well with construction problems may be more susceptible to contamination.

The MDA and Winona County Environmental Services worked together to select townships and implement the nitrate testing project. The following townships were selected: Elba, Fremont, Hart, Hillsdale, Mt. Vernon, Norton, Pleasant Hill, St. Charles, Saratoga, Utica, Warren, Wilson, and Wiscoy. The initial sampling in Winona County started in 2016 and follow-up sampling ended in 2017.

Results
Two datasets are used to evaluate nitrate. The initial well dataset contains 940* wells; the final dataset contains 731 wells. Wells that had nitrate-nitrogen results over 5 mg/L were removed from the initial dataset if a non-fertilizer source or well problem was identified, to form the final well dataset. A total of 209 wells (22%) were removed. The results from the initial and final well datasets are summarized in the table below.

In Fremont, Saint Charles, Utica, and Warren Townships, more than 10% of the wells were over the Health Risk Limit of 10 mg/L of nitrate-nitrogen (map below). The percent of wells over the Health Risk Limit in each township ranged from 0% to 42.9%. The Winona County Final Report will be available on the MDA website in 2018: www.mda.state.mn.us/townshiptesting.

Next steps
The MDA uses the final well dataset to determine if additional action is warranted, as described in the Minnesota Nitrogen Fertilizer Management Plan (NFMP). The MDA uses the assessment process and prioritization guidelines in the NFMP to determine next steps. Find more information about the NFMP on the MDA website at www.mda.state.mn.us/nfmp.

Funding Acknowledgement

Funding for this project is provided by the Clean Water, Land and Legacy Amendment

Winona County Final Highlights
- Number of townships with 10% of wells over the HRL: 4
- 209 (22%) wells removed from initial data set.

Published May 2018
Table: Winona County Private Well Nitrate Results, 2018.

<table>
<thead>
<tr>
<th>Township</th>
<th>Initial Well Dataset</th>
<th>Final Well Dataset</th>
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<tbody>
<tr>
<td></td>
<td>Total Wells*</td>
<td>Percent of Wells ≥10 mg/L Nitrate-Nitrogen</td>
</tr>
<tr>
<td>Elba</td>
<td>62</td>
<td>16.1%</td>
</tr>
<tr>
<td>Fremont</td>
<td>42</td>
<td>54.8%</td>
</tr>
<tr>
<td>Hart</td>
<td>48</td>
<td>18.8%</td>
</tr>
<tr>
<td>Hillsdale</td>
<td>52</td>
<td>1.9%</td>
</tr>
<tr>
<td>Mt. Vernon</td>
<td>33</td>
<td>15.2%</td>
</tr>
<tr>
<td>Norton</td>
<td>80</td>
<td>11.3%</td>
</tr>
<tr>
<td>Pleasant Hill</td>
<td>58</td>
<td>8.6%</td>
</tr>
<tr>
<td>St. Charles</td>
<td>85</td>
<td>34.1%</td>
</tr>
<tr>
<td>Saratoga</td>
<td>56</td>
<td>19.6%</td>
</tr>
<tr>
<td>Utica</td>
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<td>46.5%</td>
</tr>
<tr>
<td>Warren</td>
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</tr>
<tr>
<td>Wilson</td>
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</tr>
<tr>
<td>Wiscoy</td>
<td>50</td>
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</tr>
<tr>
<td>Total</td>
<td>940</td>
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</tr>
</tbody>
</table>

* All well types included.

Figure: Winona County Final Well Dataset Map, 2018.
Our groundwater resources are being threatened by both overuse and contamination from various sources. As a member of Trout Unlimited, a resident of Winona County and a retired product assurance engineer I am writing to express my concerns in regards to the Daley Farms’ proposed feedlot expansion and the potential environmental impact to the area.

The potential environmental concerns resulting from expanding the herd from 2275 animal units to nearly 6000 and generating 46 million gallons of manure annually include:

- A breach or complete failure of the manure holding system due to a heavy rainfall event, such as the one that occurred in 2007 (16 inches in 24 hours) potentially resulting in significant environmental damage and fish kills in the Whitewater and/or Rush Creek watersheds.
- The porous limestone karst geology of the region allows pollutants to enter the ground water quickly impacting many residents drawing water from shallow groundwater wells. This may also be a problem during spring runoff after heavy snowfalls.
- Additional demands on the groundwater system (estimated to be 92 million gallons annually) will potentially affect groundwater levels resulting in higher concentrations of nitrates and other contaminants in the water supply. This is already a problem in some parts of the area.
- A manure leak can also contaminate certain types of crops posing a hazard for human consumption.

To assess these and other potential environmental hazards associated with the expansion of the Daley dairy herd operation an Environmental Hazard Analysis (EHA) must be performed.

The primary goal of the EHA process is the assessment of environmentally critical systems, the expanded feedlot operation in this case. An environmentally critical system is one that poses a reasonable threat to the environment in the event of a system malfunction or catastrophic failure. These events can result in violation of applicable regulations, or can result in significant environmental damage and clean up costs and pose health risks to the local population. The identification and control of potential hazards requires consideration of many factors including the proposed system design, operation and maintenance of the system as well as applicable regulations.

Based on the concerns identified no activity should be allowed to go forward until a full Environmental Hazard Analysis or similar assessment is performed with appropriate countermeasures identified to mitigate all potential environmental hazards.

There are many stakeholders impacted by the actions being considered in this matter. Therefore careful consideration must be given to all the issues raised by those involved in this debate. The decisions we make today will have a long and lasting impact on our local environment and valuable natural resources.

Roger M. Berg
Hello,

I’ve read through the EAW for the Daley Farm expansion in Winona County, and have a number of questions and concerns about the environmental impact of the proposed project:

- A major concern is whether there will be any ground water impacts from the manure application to fields. As noted in the EAW, a number of fields to receive manure contain karst features, are very near to bedrock, or the water table. All these conditions would facilitate nutrients and bacterial pollutants entering our ground water. The sheer volume of manure also presents a threat to surface water if a large rain hits during the application. A manure management plan will help, but I am not sure it will alleviate all impacts. I am skeptical that the CAWT will know where these sensitive features are and be able, or willing to put in the effort, to manage the manure disposal to prevent impacts. The proximity of the Utica and Lewiston drinking water wells are also somewhat concerning.

- 92 Million gallons of water is likely to be used by the operation, which I expect is more than the whole City of Lewiston uses annually. Will such a large withdrawal impact water table depth, and how does it compare to recharge rates? The existing wells on the Daley Farm seem to draw from the same Wonewoc aquifer level as the Lewiston public supply.

- Transportation numbers in 9.A. do not seem to include manure hauling events, which may be significant for the periods of application.

- I did not see any reference to greenhouse gases emissions such as methane and nitrous oxides. Both are tied to cattle and manure, and are potent greenhouse gases. Under the standard EAW, such numbers would be part of the EAW, and I would like to see them added to the alternative Feedlot EAW, possibly under #11 of the EAW.

- Under #5, stormwater from the feed storage pad will enter the storage basin and then be managed, but it is not clear where the 1.7 million gallons will go. Will it be applied to fields? Mixed with manure?

- I believe there may also be an erosion control permit required from the County (listed at the end of #10).

- The manure ponds are listed as being able to handle 281 days worth of manure. Does this number factor in the additional wash water from the sand cleaning operation and natural precipitation? I could see these two factors pushing the number below 270 days of storage if they are not already in the calculation.

- Small details, but I suspect you mean technician instead of “Technical” in the last paragraph of p. 13 and intended to say designed instead of “deigned” in the last sentence before the Emergency Response Plan section on p. 19.

Outside of these questions, I believe the EAW is comprehensive. Therefore if the above questions/concerns can be answered independently to doing an EIS, I do not feel a full EIS would be required.

Thank you for your consideration,

John Howard
On behalf of the Minnesota Well Owners Organization (MNWOO), we submit the following comments on the Daley Farms feedlot expansion.

We respectfully request that an Environmental Impact Statement (EIS) is needed to address the serious and extensive water quality problems for all water resources in the area of the proposed expansion. We conclude that there is not an area within the State of Minnesota that has more polluted water resources than that part of western Winona County situated for the feedlot expansion. We believe that this feedlot expansion will exacerbate the ongoing impairment of trout streams destroying remaining aquatic life and habitat, and intensify the poisoning of both private and public drinking water supplies creating an acute public health crisis.

**Current Documented Contamination of Water Resources in the Area of the Daley Farms Confined Dairy Feedlot**

- Utica, Bethany, and Lewiston, the three municipalities closest to the Daley Farms, have elevated nitrate contamination between 3 and 10 mg/L in their public water systems. Nearly 75% of all nitrogen contamination comes from row crop production from growing corn and soybeans (see [https://www.pca.state.mn.us/sites/default/files/wq-s1-80.pdf](https://www.pca.state.mn.us/sites/default/files/wq-s1-80.pdf)). In addition, these public water systems have concentrations of one of more of the following commonly detected herbicides used on row crops in the area: acetochlor and its metabolites, alachlor and its metabolites, metolachlor and its metabolites, and atrazine and its metabolites. See: [http://www.health.state.mn.us/divs/eh/water/com/dwar/report2014.pdf](http://www.health.state.mn.us/divs/eh/water/com/dwar/report2014.pdf)

- Utica Township and the surrounding areas have some of the highest nitrate contamination in private wells and the highest occurrences of private wells above the Health Risk Limit (HRL) of 10 mg/L (see table below). Nearly half of the wells tested the area of Daley Farms in 2016 by the Minnesota Department of Agriculture are currently above the HRL. The nitrate HRL was promulgated to protect the most vulnerable part of our population - expecting mothers and babies under 6 months old. In addition, these private wells have concentrations of one of more of the following commonly detected herbicides used on row crops in the area: acetochlor and its metabolites, alachlor and its metabolites, metolachlor and its metabolites, and atrazine and its metabolites.
Table: Winona County Initial Well Dataset Results, 2016.

<table>
<thead>
<tr>
<th>Township</th>
<th>Number of Wells Tested</th>
<th>Min Nitrate-N</th>
<th>Max Nitrate-N</th>
<th>Mean Nitrate-N</th>
<th>Median Nitrate-N</th>
<th>Percent of Wells ≥10 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elba</td>
<td>62</td>
<td>&lt;0.25</td>
<td>20.4</td>
<td>4.5</td>
<td>3.4</td>
<td>16.1%</td>
</tr>
<tr>
<td>Fremont</td>
<td>42</td>
<td>&lt;0.25</td>
<td>43.8</td>
<td>10.6</td>
<td>11.4</td>
<td>54.8%</td>
</tr>
<tr>
<td>Hart</td>
<td>48</td>
<td>&lt;0.25</td>
<td>32.7</td>
<td>5.7</td>
<td>4.4</td>
<td>18.8%</td>
</tr>
<tr>
<td>Hillsdale</td>
<td>52</td>
<td>&lt;0.25</td>
<td>12.9</td>
<td>1.7</td>
<td>&lt;0.25</td>
<td>1.9%</td>
</tr>
<tr>
<td>Mt. Vernon</td>
<td>33</td>
<td>&lt;0.25</td>
<td>14.4</td>
<td>4.5</td>
<td>3.5</td>
<td>15.2%</td>
</tr>
<tr>
<td>Norton</td>
<td>80</td>
<td>&lt;0.25</td>
<td>23.1</td>
<td>4.3</td>
<td>2.8</td>
<td>11.3%</td>
</tr>
<tr>
<td>Pleasant Hill</td>
<td>58</td>
<td>&lt;0.25</td>
<td>18.6</td>
<td>3.4</td>
<td>2.2</td>
<td>8.6%</td>
</tr>
<tr>
<td>St. Charles</td>
<td>85</td>
<td>&lt;0.25</td>
<td>34.8</td>
<td>7.0</td>
<td>4.7</td>
<td>34.1%</td>
</tr>
<tr>
<td>Saratoga</td>
<td>56</td>
<td>&lt;0.25</td>
<td>25.8</td>
<td>5.1</td>
<td>2.3</td>
<td>19.6%</td>
</tr>
<tr>
<td>Utica</td>
<td>86</td>
<td>&lt;0.25</td>
<td>27.9</td>
<td>8.9</td>
<td>8.6</td>
<td>46.5%</td>
</tr>
<tr>
<td>Warren</td>
<td>92</td>
<td>&lt;0.25</td>
<td>29.3</td>
<td>6.8</td>
<td>5.2</td>
<td>28.3%</td>
</tr>
<tr>
<td>Wilson</td>
<td>196</td>
<td>&lt;0.25</td>
<td>34.8</td>
<td>2.2</td>
<td>0.3</td>
<td>6.1%</td>
</tr>
<tr>
<td>Wiscoy</td>
<td>50</td>
<td>&lt;0.25</td>
<td>9.4</td>
<td>1.5</td>
<td>&lt;0.25</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>940</strong></td>
<td><strong>&lt;0.25</strong></td>
<td><strong>43.8</strong></td>
<td><strong>4.9</strong></td>
<td><strong>2.1</strong></td>
<td><strong>19.1%</strong></td>
</tr>
</tbody>
</table>

*All well types included*

Figure: Winona County Initial Well Dataset Map, 2016.
-The South Fork of the Whitewater River (SFWW) is the sub-watershed of the Whitewater River that Daley Farms is located. The SFWW is currently impaired for total suspended solids/turbidity, nitrates, fecal coliform bacteria, stressful temperatures, and degraded habitat (see map below). The Daley Farms row cropping land use in the SFWW contribute to these impairments through soil, nutrient, and pesticide loss from fields where manure and commercial fertilizer and pesticides are applied. In addition, bacteria from manure applied to row crop fields pollute the SFWW.
See: https://www.pca.state.mn.us/sites/default/files/wq-iw9-18e.pdf

-On July 28, 2015 a major fish killed occurred on the SFWW. The Minnesota Department of Natural Resources estimated that 10,000 fish were killed and 6.5 miles of stream were poisoned killing nearly all aquatic life. Although State agencies could not determine the exact cause of the fish kill, recent applications

In sum, the current agricultural land use practices of the Daley Farms and their neighbors are causing significant groundwater and surface water contamination. The contamination of municipal and private drinking water supplies surrounding the Daley Farms are a threat to human health in the area. The streams flowing from this area are contaminated with bacteria, pesticides, sediment, and nutrients. These pollutants are causing long-term degradation of aquatic health and occasionally reach high enough levels to wipe out all the aquatic life in a stream. The cumulative evidence of existing water quality problems in the immediate vicinity of the Daley Farm operation warrant further study. Therefore MNWOO requests that an EIS be commenced on this proposed feedlot expansion to examine these ongoing risks to human and aquatic health.
Minnesota Center for Environmental Advocacy ("MCEA")
Comments on the Environmental Assessment Worksheet and the
Need for an Environmental Impact Statement
for the Daley Farms of Lewiston, LLC dairy expansion in Winona County

November 15, 2018
The Minnesota Center for Environmental Advocacy ("MCEA" or "Petitioner") requests that the Minnesota Pollution Control Agency ("MPCA") prepare an Environmental Impact Statement ("EIS") for Daley Farms of Lewiston, LLC dairy expansion ("Daley Expansion" or "the project") in Winona County. Petitioner also requests that MPCA deny Daley Farm’s request for a National Pollutant Discharge Elimination System (NPDES) / State Disposal System (SDS) Permit ("Permit"). If MPCA issues a negative declaration on the EIS, Petitioner requests that MPCA grant a contested case hearing pursuant to Minn. R. 7000.1800-1900 due to material issues of fact with regard to whether the Daley Expansion can be operated in compliance with Minnesota Rules chapter 7020 and other applicable laws, as discussed in the Permit comment (concurrently filed).

I. TIMELINESS

These requests are timely. MPCA published the Public Notice of the Environmental Assessment Worksheet ("EAW") and intent to issue an NPDES permit for the Daley Expansion on October 1, 2018, and extended the comment period until November 15, 2018 at the request of Petitioner and others, due to the fact that this comment period coincided with harvesting, and because of the complexity of the project. Similarly, the petition for a contested case is timely pursuant to Minn. R. 7000.1800, which provides that a petition for a contested case hearing “must be submitted during the public comment period established under parts 7001.0100.”

II. SUMMARY OF REASONS

Minn. R. 4410.1700, subp. 1 provides that “[a]n EIS shall be ordered for projects that have the potential for significant environmental effects.” For the Daley Expansion, ample evidence exists that, due to location of the project, existing levels of pollutants in surface and
groundwater, and the volume of manure that will need to be managed, the project poses the potential for significant environmental effects.¹

Simply put, the project does not have enough acres of land to accommodate the volumes of manure produced by the facility, and the land that has been identified for application is pocked with karst features that will convey manure directly to ground and surface waters. For the same reasons, Petitioner asserts that the project as proposed cannot comply with the requirements of the Clean Water Act and state law and would endanger public health in an area that is already experiencing the health impacts of contaminated drinking water. Because evidence establishes that the proposal cannot comply with federal and state law and the effluent limitations in the draft permit, Petitioner requests that the MPCA deny the NPDES permit for the Daley Expansion. If the agency does not deny coverage, Petitioners request that the agency refer the disputed issues of material fact to the Office of Administrative Hearings for resolution in a contested case hearing.

III. STATEMENTS OF INTEREST

MCEA is a Minnesota nonprofit public interest organization with over 3,000 members including many in Winona County, and its mission is to use law, science, and research to protect and enhance Minnesota’s natural resources, wildlife, and the health of its people. MCEA has advocated for sustainable agriculture for many years, and was integrally involved in the feedlot rule amendments implemented in the early 2000s.

IV. AN EIS IS REQUIRED

Under applicable rules, the MPCA must decide whether a project has the potential for significant environmental effects by applying the following factors:

¹ E. Calvin Alexander Jr., Comment on Daley Farms of Lewiston, LLP:2018 Dairy Expansion – EAW (p-ear2-143i), attached as Exhibit 1.
A. type, extent, and reversibility of environmental effects;
B. cumulative potential effects. The RGU shall consider the following factors: whether the cumulative potential effect is significant; whether the contribution from the project is significant when viewed in connection with other contributions to the cumulative potential effect; the degree to which the project complies with approved mitigation measures specifically designed to address the cumulative potential effect; and the efforts of the proposer to minimize the contributions from the project;
C. the extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority. The RGU may rely only on mitigation measures that are specific and that can be reasonably expected to effectively mitigate the identified environmental impacts of the project; and
D. the extent to which environmental effects can be anticipated and controlled as a result of other available environmental studies undertaken by public agencies or the project proposer, including other EISs.2

The EAW for the Daley Expansion lacks sufficient information to support a finding that the project does not have the potential to cause significant environmental impacts. Therefore, an EIS must be ordered.3 While this alone compels a decision to require an EIS, at the very least the lack of complete information supports the need to either “make a positive declaration and include within the scope of the EIS appropriate studies to obtain the lacking information” or “postpone the decision on the need for an EIS, for not more than 30 days or such other period of time as agreed upon by the RGU and proposer, in order to obtain the lacking information.”4

A. The Daley Expansion Has The Potential For Significant Environmental Impacts As A Result Of Cumulative Impacts Because Existing Water Quality Is Already Impacted By Similar Pollutants.

Winona County is a highly sensitive karst region. As the result of existing agricultural uses, water quality is suffering in Winona County. A significant proportion of the ground and surface water is already contaminated by nitrate and bacteria, and safe drinking water sources are increasingly difficult to find. The problem is created when fertilizers, both manure and

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2 Minn. R. 4410.1700, subp. 7
3 Minn. R. 4410.2000, subp. 3, 4410.1700, subp. 1.
4 Minn. R. 4410.1700, subp. 2a.
nitrogen fertilizer, are land applied, and seep, leach, or are otherwise discharged to groundwater
and rivers and streams through the porous geology. Despite this existing problem, Daley Farms
is proposing to significantly increase the amount of manure that will be landspread in a highly
susceptible karst region.

The contribution from the project to existing pollution must be viewed as significant in
connection with other contributions. If the expansion is granted, Daley Farms will need to
dispose of 46.2 million gallons of liquid manure per year on nearby cropland. But nearly every
stream or river nearby the Daley Expansion is already contaminated by agricultural pollutants
including nitrate and bacteria, such as *E. coli* and fecal coliform. Similarly, a significant
percentage of private wells are contaminated, and public water supplies are also at risk.

In the townships where Daley proposes to spread its manure, about 40% of private wells
that have been tested already register above the health risk limit (HRL) for nitrate, with some
wells testing at over 4 times the safe levels of nitrates.

<table>
<thead>
<tr>
<th>Township</th>
<th>% Private Wells &gt; HRL</th>
<th>Max Nitrate Level Recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utica</td>
<td>46.5%</td>
<td>27.9 mg/L</td>
</tr>
<tr>
<td>Fremont</td>
<td>54.8%</td>
<td>43.8 mg/L</td>
</tr>
<tr>
<td>Saint Charles</td>
<td>34.1%</td>
<td>34.8 mg/L</td>
</tr>
</tbody>
</table>

*the results are based on data collected by the Minnesota Department of Agriculture’s Township
Testing Program.5

Six of the Dales Farms’ proposed manure application sites are within the Utica Drinking
Water Supply Management Area (DWSMA), which is rated “Highly Vulnerable.”6 The public

5 Minnesota Dep’t of Agriculture, *Winona County: Final Overview of Nitrate Levels in Private
winonafinal201617_0.pdf.
6 See Map of Manure Application Acres Proposed at Daley Farms & Drinking Water Supply
Management Area Vulnerability, attached as Exhibit 2.
water supply for Utica is at serious risk and has registered over the nitrate HRL in recent years.\textsuperscript{7} Other manure-spreading locations are also already impacted. Between 2011 and 2016, coliform was registered as present in the non-community water supplies of Trout Valley Trail in Lewiston.\textsuperscript{8} Coliform was also present in 3 locations in nearby St. Charles: Discount Grocery, Berea Moravian Church, and SEMA equipment.\textsuperscript{9} Coliform was also detected in the Whitewater State Park and Wildlife Management Area in Altura.\textsuperscript{10,11}

In this sad reality, any additional pollution has the potential to create significant environmental effects as a result of cumulative impacts.

\textbf{B. The EAW Relies On Disproved “Mitigations” To Conclude That No Impacts Will Occur}

Of key concern is the fact that the EAW heavily relies on entirely unproven assumptions to conclude that the proposed expansion will not significantly impact the environment. The MPCA must consider “the extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority.”\textsuperscript{12} In considering these effects, “the RGU may rely only on mitigation measures that are specific and that can be reasonably expected to effectively mitigate the identified environmental impacts of the project.”\textsuperscript{13} It may not rely on “mitigations” that are disproved by the available evidence.

\textsuperscript{7} See Minnesota Department of Health public water supply test results for PSWID 1850011 from 2016-2018, available by request from Minnesota Department of Health.
\textsuperscript{9} Id.
\textsuperscript{11} Despite a request to Winona County, MCEA was unable to obtain data on bacteria levels in private wells in this area during the comment period.
\textsuperscript{12} Minn. R. 4410.1700, subp. 7.
\textsuperscript{13} Id.
Although the EAW acknowledges that “feedlots may impact these impairments (for nitrate, TSS, E. coli and impaired biota) by contributing nutrients and fecal bacteria through overland runoff or drain tile intakes from the application of manure,” the EAW contains no further analysis on this question. Instead, the EAW simply presumes this impact away:

- “Manure application at this field must be done according to its MMP\(^{15}\) and cannot exceed agronomical rates; therefore, the PCA does not expect cumulative impacts.”
- “The applied manure from the Project will not add additional nutrients, but will replace the use of commercial fertilizer at the manure application sites.”
- “Manure application provides enhanced soil tilth, a beneficial property of soil that helps retain moisture and reduce runoff from fields.”
- “The nutrients in manure from the Project will replace the use of commercial fertilizers for the manure application sites. All manure application is required to take place at agronomical rates and in accordance with Minn. R. 7020 and the Feedlot Permit.”
- “Daley expects the stormwater runoff characteristics from the Project manure application sites to remain the same, and under certain circumstances, improve because of the land application activities regulated under the Feedlot Permit. The improvements occur through developing better soil tilth from organic fertilizer and the uniform practices of incorporating manure over the acres identified in the MMP.”
- “Daley expects no change in stormwater runoff characteristics (physically and chemically) from the Project manure application sites.”

No analysis is undertaken to determine the veracity of these assumptions, and indeed, they cannot be supported. Under state law, the EAW has not considered the environmental impacts that are “reasonably expected to occur.”\(^{16}\) Instead of analyzing these reasonably foreseeable impacts, the EAW concludes they will not occur on the basis of two disproven assumptions, neither of which can reasonably be construed as “mitigations” that would justify a finding of no significant impact.

\(^{15}\) Manure Management Plan (“MMP”)
\(^{16}\) Minn. R. 4410.1700, subp. 6.
1. **Manure does not replace commercial fertilizer.**

In the EAW, MPCA maintains that the groundwater and surface waters at the site and its surrounding area are already contaminated with nitrates, total suspended solids, and *E. coli*, but argues that the proposal “will not add additional nutrients, but will replace the use of commercial fertilizer at the manure application sites.”¹⁷¹⁷ This replacement assumption is a critical component of the conclusion that the project will not add to the already heavy nutrient and pathogen load to area waters, but the EAW provides no evidence or even reasoning to support this assumption. In fact, the available evidence suggests that the exact opposite is true, rendering the EAW’s conclusions fundamentally baseless and therefore legally inadequate.

According to survey data collected by the Department of Agriculture, 74% of farmers in Southeastern Minnesota apply commercial fertilizers to their manured fields, and 83% did not know how much nitrogen was in the manure they applied to their fields.¹⁸¹⁸ Proper application of commercial fertilizers requires the applicator to take into account the nitrogen applied to the field from manure, but the vast majority of producers in Southeastern Minnesota are entirely unable to make this adjustment. As a result, nearly half of the corn fields in Minnesota that are applied with both manure and commercial fertilizer received over 200 pounds of nitrogen per acre, well over the recommended limit.¹⁹¹⁹ The *average* amount of nitrogen from manure and commercial fertilizer per acre is 191 pounds; again well over the recommended limit.²⁰²⁰ The vast majority of

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¹⁷ EAW at 22; see also *id.* at 24 (“The nutrients in manure from the Project will replace the use of commercial fertilizers for the manure application sites.”).
¹⁹ *Id.* at 161.
²⁰ *Id.* at 254.
producers do not use variable rate manure applications, and a majority are unaware of manure application rates at all.\textsuperscript{21}

In the face of this data, it is unreasonable and capricious for the agency to assert that the application of 46.5 million gallons of liquid manure to area croplands will not add nutrients and bacteria to the already impaired surface and groundwaters. The data very clearly show that manure applicators apply manure \textit{in addition to} their applications of commercial fertilizer, and that fertilizer rates are not reduced by the application of manure.

\textbf{2. Manure management plans do not prevent overapplication.}

MPCA also presumes that manure management plans will prevent the type of significant ground and water pollution that is already proven to occur in the area where Daley Farms is located. The EAW for Daley Farms repeatedly concludes that compliance with MMPs will prevent any impacts to groundwater or surface water. But Petitioner has evidence that the use of manure management plans fails to prevent overapplication and cumulative impacts. For example, as the EAW observes, Daley Farms proposes to apply manure on a field that also receives manure from a nearby swine facility operated by Holden Farms.\textsuperscript{22} In addition, MDA’s data shows that manure applicators are almost entirely unaware of the nitrogen content of the manure they are applying to fields, but the EAW for Daley Farms concludes, without any evidence or support of any kind: “[m]anure application at this field must be done according to its MMP and cannot exceed agronomical rates; therefore, the PCA does not expect cumulative impacts.”\textsuperscript{23}

Based on the information presented by Petitioner above, it is clear that the use of MMPs will not, and do not, prevent pollutants from reaching surface waters, nor do MMPs prevent

\textsuperscript{21} \textit{Id.} at 250.
\textsuperscript{22} EAW at 21. The manure application site numbered 41 for the Daley project is the same site numbered 36 for the Holden Farms Inc., Sites 1 and 2 swine facility in Winona County.
\textsuperscript{23} \textit{Id.}
overapplication of transferred manure or the cumulative impacts of oversaturation of liquid
manure applied in a relatively small area by multiple sources.

MPCA’s own documentation shows the impact of feedlot manure on the watershed. The
Watershed Restoration and Protection Strategy (WRAPS) for the Mississippi River – Winona
Watershed identifies ongoing bacterial contamination as a main issue that needs to be
addressed.24 The Lower Mississippi River Fecal Coliform TMDL identifies “Livestock Facilities
with NPDES Permits” and “Livestock Manure” as “major source categor[ies]” for bacterial
contamination.25 The report concludes that “runoff from livestock feedlots, pastures, and land
application areas has the potential to be a significant source of fecal coliform bacteria and other
pollutants.” The study also implicitly acknowledges that producer adoption of MMPs is a largely
aspirational goal, contrary to the oft-stated assumption that applicators follow the manure
application rates in their MMPs.26 The more recent Mississippi River – Winona Watershed
Pollutant Reduction Project (Total Maximum Daily Load Study) for Nutrients, Sediment and
Bacteria concludes that:

Livestock manure is often either surface applied or incorporated into farm fields
as fertilizer and soil amendment. This land application of manure has the potential
to be a substantial source of fecal contamination, entering waterways from
overland runoff and drain tile intakes. Research being conducted in southern
Minnesota shows high concentrations of fecal bacteria leaving fields with
incorporated manure and open tile intakes. Minn. R. ch. 7020 contains manure
application setback requirements based on research related to phosphorus
transport, and not bacterial transport, and the effectiveness of these current
setbacks on bacterial transport to surface waters is not known.27

24 Minnesota Pollution Control Agency, Mississippi River – Winona Watershed: Watershed
Restoration and Protection Strategy, at 68 [hereinafter “MRWW WRAPS”].
25 Lower Mississippi River TMDL for Fecal Coliform at 23.
26 Id. at 118 (“Funding to support technical assistance and to provide producer incentives will be
sought to maximize producer adoption of manure management plans.”).
27 Mississippi River – Winona Watershed Pollutant Reduction Project (Total Maximum Daily
Load Study) for Nutrients, Sediment and Bacteria at 51-52.
Despite all this, every feedlot EAW continues to assert that land applied manure never reaches surface or ground waters, and in fact improves water quality. To continue to do so without evidence (and where the evidence that is available suggests otherwise) while the state of the watershed continues to deteriorate is unreasonable and demands an EIS under Minnesota Rule 4410.1700.

This pattern has unfortunately continued for every feedlot EAW in the state. Expansion and consolidation in the industry has led to more animals and more manure being concentrated in highly localized areas, and water quality continues to suffer not just from nutrients but from pathogens like E. coli, which is not derived from commercial fertilizers but from animal manure. And yet in each instance, the MPCA repeats the same conclusions: agronomic rates of manure application ensure no environmental impact. Every feedlot EAW in fact contains the same conclusion: that new or expanded feedlots improve water quality in the surrounding area. Under state law, however, rote repetition cannot substitute for actual evidence, inquiry, and analysis.

This EAW is devoid of any actual evidence showing that the additional production of incredible amounts of manure will not affect surrounding waters in any way. At some point, the landscape is physically unable to absorb additional manure applications. However, MPCA’s regulatory scheme entirely fails to account for any sort of physical limits of the land. As far as state-level regulation of feedlots is concerned, facilities could continue to expand ad infinitum, and the agency would bless that expansion with the same refrain: application cannot exceed agronomic rates, and therefore there are no impacts to the expansions. Minnesota Rule 4410.1700 requires the RGU to make a determination on the need for an EIS by considering the

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28 See, e.g. Mississippi River – Winona Watershed Pollutant Reduction Project (Total Maximum Daily Load Study) for Nutrients, Sediment and Bacteria at section 3.5.2.1.
“cumulative potential effects” of the proposal,²⁹ which is defined as the “effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid.”³⁰ In making this determination, the RGU may not rely on “bare assertions” alone, and a negative determination on the need for an EIS that is based on bare assertions alone is a violation of the Minnesota Administrative Procedure Act (MAPA).³¹ Here, the EAW’s conclusions on the potential for significant environmental effects is based on multiple critical assumptions – that manure applicators actually apply at agronomic rates and that manure applications substitute for applications of commercial fertilizers - that are unsupported by any evidence at all, and are in fact contrary to evidence. The MPCA cites no “independent scientific data, agency opinions, or studies” supporting these key assertions,³² thereby violating both MEPA and MAPA.

C. The EAW Fails To Address Cumulative Impacts Due To Manure Releases.

Despite the MPCA’s optimistic assumptions that feedlots improve water quality, outside of the EAW context the agency is clear that this is not the case. The available evidence tells us something different. The Mississippi River – Winona Watershed Restoration and Protection Strategy states that liquid storage manure areas are sources of bacterial contamination from leakage and structural failures.³³ Elsewhere MPCA regularly reports on the overtopping of manure storage facilities from precipitation, noting recently that “heavy rains in southern

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²⁹ Minn. R. 4410.1700, subp. 7.
³⁰ Minn. R. 4410.0200, subp. 11a.
³¹ See CARD v. Kandiyohi County Bd. Of Comm’rs, 713 N.W.2d 817, 837 (Minn. 2006).
³² Id.
³³ MRWW WRAPS at 41
Minnesota find some livestock producers scrambling to stem the overflow from livestock manure storage basins.”

The MPCA regularly publishes newsletters advising livestock producers to take steps to account for increased precipitation in order to avoid overtopping manure storage basins. Those recommendations state:

> It’s been cold and wet so far this October, delaying crop harvest. This makes it challenging to get manure applied in a timely fashion and for liquid manures there is a risk of overflow from storage basins.

These high precipitation events will only get more frequent and more intense with climate change, but the EAW ignores this entirely.

V. THE EAW FAILS TO ACCOUNT FOR THE IMPACTS OF, AND CONTRIBUTIONS TO, CLIMATE CHANGE

A. The Proposed Expansion Will Significantly Contribute To The State’s Greenhouse Gas Emissions

The proposed expansion would house 4,628 cows, of which 3,983 are dairy cows and 645 are heifers or calves. Recently calculated emission factors estimate that the average dairy cow in the United States produces 158.7 kg methane per animal per year via enteric fermentation, and 137 kg methane per animal per year via manure management. Meat and other cattle (e.g. heifers and calves) produce 58.8 kg and 2.4 kg methane per animal per year via enteric

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37 MRWW WRAPS at 43, and Section V.
38 EAW at 4.
fermentation and manure management, respectively. In total the Daley Farms expansion would produce 1,217,247.1 kg of methane per year. Methane is many times as potent a greenhouse gas as CO2, and over the next twenty years a kg of methane will warm the planet as much as 84-86 kg of CO2. The 1.2 million kg of methane emitted by this proposal will therefore warm the planet by the equivalent of 102,248,748 kg of CO2, or 102,248 metric tons. This is the same GHG emissions as driving 21,895 cars for a year, or burning 558 rail cars full of coal. This would make the expanded Daley Farms the 43rd largest GHG emitter in the state, larger than power plants in Red Wing, Blue Earth County, Mower County, and Minneapolis.

If the concentrated dairy industry is viewed as whole, it would be one of the state’s largest greenhouse gas emitters. Even just looking at large dairies with over 1,000 AU, there are 95 such facilities in the state, housing a total of 269,770 AU of dairy cattle. Together these large dairies produce roughly 4,601,160 metric tons of CO2 equivalent GHGs a year, which

40 Id.
41 3,983 dairy cows at 158.7 kg methane = 632,102.1 kg methane via enteric fermentation. 3,983 dairy cows at 137 kg methane = 545,671 kg methane via manure management practices. 645 meat or other cattle at 24 kg methane = 37,926 kg methane via enteric fermentation. 645 meat or other cattle at 2.4 kg methane = 1,548 kg methane via manure management practices. See Wolf et al., supra.
43 U.S. EPA, Greenhouse Gas Equivalencies Calculator, available at https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator. 44 U.S. EPA, GHG Reporting Program Data Sets, available at .https://www.epa.gov/ghgreporting/ghg-reporting-program-data-sets. 45 Data derived from state GIS information. 46 This estimate assumes that the Daley Farms profile of dairy cows, heifers, and calves is representative of these large dairies. 269,770 AU of dairy cattle is equivalent to about 45 operations similar to Daley Farms’ 6,000 AU proposal.
would make these dairy farms the #3 emitter of GHGs in the state, just below the Sherco and Boswell coal fired power plants.

Despite being a significant emitter by itself, and despite being part of an industry that cumulatively contributes more greenhouse gases than any other industry besides coal-fired electricity, the EAW contains no analysis of greenhouse gas emissions whatsoever. Question 6 of the EAW summarizes many other air emissions, including odors, hydrogen sulfide, ammonia, and dust, but no estimates of CO2, methane or nitrous oxide emissions. This omission is notable, for in Minnesota, agriculture is the third largest source of greenhouse gases.47 The failure to account for these impacts, both for the individual project and for the cumulative emissions of comparable projects, violates MAPA.48

B. The EAW relies on out-of-date rainfall data

Animal feedlots or manure containment areas are required to meet the effluent limits for five-day biochemical oxygen demand of 25 mg/L49 unless it falls under the conditions for phosphorus effluent limits from existing facilities as specified in Minn. Rule 7053.0255. These effluent limits apply to stormwater leaving the facility as well as other treated and untreated effluent. These effluent limits do not apply, though, should the animal feedlot or manure storage areas overflow due to rainfall if the facilities are designed, constructed, and operated:50

- to meet effluent limits for rainfall events less than or equal to a 25-year, 24-hour rainfall event for that location; or
- to collect and contain the runoff from a 25-year, 24-hour rainfall event for that location.

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48 See Pope Cty. Mothers v. Minnesota Pollution Control Agency, 594 N.W.2d 233 (Minn. Ct. App. 1999); CARD, 713 N.W.2d at 829.
49 Minn. R. 7053.0305 subp. 2(A).
50 Minn. R. 7053.0305, subp. 2(B).
The rainfall depth used in designing an animal feedlot for a 25-year, 24-hour rainfall event is the amount of rainfall over 24-hours that on average will be exceeded only every 25-years. Similarly, it is a depth over 24-hours that has a 1/25 chance of being exceeded in any given year.

The EAW for the Daley Farms expansion states that the proposed facility will be designed to withstand a rainfall event of 5.4 inches. This is lower than the median 25-Year, 24-hour rainfall event of 5.57 inches from the NOAA Atlas-14 for the Daley Farms.51

Unfortunately, the NOAA Atlas-14 is an outdated and insufficient resource to use for designs to prevent the overflow and discharge of raw manure into nearby waterways. Atlas-14 provides precipitation frequency estimates for durations of 5-minutes through 60-days at average recurrence intervals of 1-year through 1,000-year for eleven Midwestern states. It uses data from stations across Minnesota, yet the estimates for Southeast Minnesota do not incorporate data newer than 2011.52

The increased precipitation from anthropogenic climate change has begun to accelerate in recent years, but the rainfall data relied on by the EAW does not take this acceleration into account. As an illustration that the rainfall patterns in the region around the Daley Farm are shifting, annual rainfall measured at the Winona Dam 5A weather station shows increasing annual rainfall due to climate change. See Figure 1. This trend is accelerating for extreme weather events as well. Increased storm intensity can appear as increased depth of a given type of rainfall event or as a greater frequency of heavy rainfall events. These events can have highly

53 Id.
localized effects, and Southeast Minnesota in particular has likely experienced the wettest six years on record since 2011. These events are not included in the Atlas-14 modeling. Designs for the Daley Farms derived from Atlas-14 will therefore be undersized for their stated purpose.

Figure 1: Total annual precipitation as measured at the Winona Dam 5A Weather Station since 1941

![Graph showing annual precipitation at Winona Dam 5A from 1940 to 2020.]

Knowing that even the most up-to-date resources like Atlas-14 are already out-of-date due to the quickly changing climate, many engineers compensate by using rainfall depths at or near the upper 90% confidence interval. That means that using the given dataset, there is only a 5% chance that real life rainfall depth, at the specified frequency, will exceed the modeled upper 90% confidence level. Compare this to a greater than 50% likelihood that rainfall depths will exceed the estimated depth currently used in Daley Farm designs. Since it is known that real life rainfall depths will be higher than those modeled in Atlas-14 and given the potential impacts of the uncontrolled release of manure, it is warranted to use the upper 90% confidence interval for

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54 Personal communication with Kenneth Blummenfeld, Senior Climatologist, Minnesota State Climate Office.
55 Years with missing data are not shown. The trend line is a linear fit of the data showing a long-term increase in the annual rainfall near the Daley Farm.
designs at the Daley Farms. The Atlas-14 upper 90% confidence interval at the Daley Farms is 7.31 inches.\textsuperscript{56}

This increased precipitation has a direct role on the environmental impacts that can be reasonably expected to occur from the project.\textsuperscript{57} Overall, the precipitation an area receives in wetter years will roughly double the nitrate leaching losses to groundwater.\textsuperscript{58} Climate, therefore, “has a significant effect on nonpoint source N loadings to Minnesota groundwater,” and yet the EAW concludes no analysis whatsoever of this effect.\textsuperscript{59}

C. The EAW Fails To Consider The Significant Impacts To The Environment And Current Wells Posed By Daley’s Proposed New Irrigation Wells.

The Daley Farms proposes to expand its current water use by over three times. The current wells used for livestock watering will continue to be used, and two additional wells will be constructed and permitted.

The current wells used by the Daley Farms are permitted for a combined 60 million gallons per year (“MGY”) and have a combined reported usage of 23.4 MGY to 35 MGY since they were installed in 2010.\textsuperscript{60} Both current wells draw from the Wonewoc Aquifer.\textsuperscript{61} Permission from the MN DNR will be required if modifications are to be made to the current wells to

\textsuperscript{56} See Atlas-14 output for Daley Farms, attached as Exhibit 3.
\textsuperscript{57} Minn. R. 4410.1700, subp. 6.
\textsuperscript{58} D.J. Mulla & J. Galzki, \textit{Nutrient Sources and Pathways to Groundwater in Minnesota} at slide 14, available at www.gwpc.org/sites/default/files/event-sessions/Mulla_DavidFINAL.pdf.
\textsuperscript{59} Mulla & Galzki, \textit{supra} at 29.
\textsuperscript{60} Based upon publicly available information in the Minnesota DNR Permitting and Reporting System (MPARS).
\textsuperscript{61} MN DNR water appropriations Permit Number 2010-0352 for the Daley Farms includes Well Number 591916 and Well Number 678949. Well Number 591916 has a Permit Total Volume of 30 MGY and is 715 feet deep. Well Number 678949 also has a Permit Total Volume of 30MGY and is 720 feet deep. Both are permitted for Livestock Watering and draw from the Wonewoc Aquifer.
increase the pumping capacity. The two proposed new wells will be located near the current wells and at similar depths. The expected aquifers they will use are the Jordan, St. Laurence, and Tunnel City Aquifers.

Water use of greater than 1 MGY or 10,000 gallons per day requires a water use permit from the MN DNR in addition to a permit for drilling the well from the MDH. The water use permit is not granted at the same time as the well permit but later after well testing and other conditions of the permit are met that require the well to have already been constructed. Instead, the MN DNR issues a preliminary evaluation of the water use permit at the time the well permit is issued by the MDH. The preliminary evaluation gives the well owner an early indication of the likelihood that the well will cause harm to ecosystems, degrade water quality, or significantly reduce the public water supply. The Daley Farms received a preliminary approval letter from the MN DNR on October 30, 2017. As noted above, this approval only allows drilling of a well; it does not authorize the well owner to appropriate water.

Among the criteria MN DNR must consider in evaluating a water use permit is interference with other wells. Well interference is determined from analysis, modeling, and, primarily, by an aquifer test. In an aquifer test, the water is drawn down at the maximum requested pumping rate over time to determine if there will be impacts to other wells or surface waters. Testing and analysis necessarily occur after the well is drilled because many factors that may contribute to interference with surrounding wells are unknown beforehand. These factors

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63 The Tunnel City and Wonewoc Aquifers are related and synonymous in this context.
64 Minn. R. 6115.0620.
65 Minn. Stat. § 103I.205.
66 Minn. Stat. § 103G.287, subd. 1(c).
67 EAW Attachment R.
69 Test pumping does not require a water appropriations permit Minn. R. 6115.0620
include the local rate of movement of groundwater, which aquifers the well will draw from once drilled, and the local interconnectedness of different aquifers between each other and with surface water. The results of an aquifer test are not included in the EAW.

The EAW lists three wells of potential concern for interference; however, there are additional wells that could also be impacted. The MDH report “Southeast Minnesota Domestic Well Network 2016 Data Report” issued in 2016 surveyed 206 domestic wells across Southeast Minnesota. The report indicates that in the Lewiston/Utica area surrounding the Daley Farm, the aquifers commonly used by domestic wells are the St. Peter-Prairie du Chien-Jordan aquifers and the Tunnel City – Wonewoc aquifers. The report also finds that, in general, the St. Peter-Prairie du Chien-Jordan aquifers in the Lewiston/Utica area have high vertical recharge rates while the Tunnel City-Wonewoc aquifers have low vertical recharge rates. Low vertical recharge rates indicate that there is likely little interaction between the two aquifer layers. It does not, however, mean that there aren’t localized interactions between the aquifers (e.g., cracks or fissures in the rock layers separating the aquifers) that would contribute to interference with wells drawing from a different aquifer than the proposed wells.

The Minnesota Well Index\textsuperscript{70} lists three wells within the same Township Section as the proposed well. See Table 1. These wells are the most likely to be impacted by the addition of a new high volume well as proposed by Daley Farms. Two of the existing wells are listed as using the Prairie Du Chien-Jordan or Prairie Du Chien aquifers. The aquifer used by the third is unknown, but it is likely, based upon the depth of the well, also drawing from the Prairie Du Chien aquifer.

\textsuperscript{70} Minnesota Dep’t of Health, \textit{Minnesota Well Index}, available at https://mnwellindex.web.health.state.mn.us/.
Table 1: Wells listed in the Minnesota Well Index located in the same Township Section as the Daley Farm.

<table>
<thead>
<tr>
<th>Well Number</th>
<th>Well Name</th>
<th>Type/Use</th>
<th>Status</th>
<th>Year</th>
<th>Depth</th>
<th>Aquifer</th>
</tr>
</thead>
<tbody>
<tr>
<td>*100014074</td>
<td>BLEYER, WAYNE – RINTER</td>
<td>Unknown</td>
<td>Active</td>
<td>Unknown</td>
<td>300</td>
<td>Prairie Du Chien-Jordan</td>
</tr>
<tr>
<td>*100014062</td>
<td>ROHRER, ROSLYN</td>
<td>Unknown</td>
<td>Active</td>
<td>Unknown</td>
<td>270</td>
<td>Unknown</td>
</tr>
<tr>
<td>100021848</td>
<td>RUPPRECHT</td>
<td>Unknown</td>
<td>Active</td>
<td>2018</td>
<td>120</td>
<td>Prairie Du Chien Group</td>
</tr>
</tbody>
</table>

The likelihood of well interference decreases the further an existing well is from the proposed well, however, the extent of the potential inference is unknown until an aquifer test is conducted. There are 32 wells in the Minnesota Well Index located in adjacent Township Sections to the Daley Farm.\(^71\) Of the 32 wells listed, 18 are domestic wells used for drinking water, and other household uses, and 12 are of unknown use. Most wells in the adjacent Sections to the Daley farm draw from the Prairie Du Chien – Jordan aquifer with most of the newer wells going deeper into the Tunnel City-Wonewoc aquifer (formerly known as the Franconia-Ironton-Galesville sandstone).\(^72\) It is quite possible that domestic wells will increasingly draw from the Tunnel City-Wonewoc aquifer as contamination of shallower groundwater becomes more pervasive. The EAW does not contain information necessary to evaluate the potential impacts on these wells.

The five high capacity wells in the vicinity of the Daley Farms also must be considered both because they may be interfered with by the proposed new wells and because they may have impacts on surrounding wells, aquifers, and surface waters that will be compounded by any new high capacity wells.\(^73\) Many of the existing water use permits rely on the same aquifers the new wells at the Daley Farm are expected to draw from which increases the likelihood of both well

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\(^{71}\) See Table 3, Wells Listed in the Minnesota Well Index Located in Adjacent Township Sections to the Daley Farm, attached as Exhibit 4.

\(^{72}\) This is consistent with the regional findings in “Southeast Minnesota Domestic Well Network 2016 Data Report” previously referenced.

\(^{73}\) See Table 4, Groundwater Appropriations from the MPARS System Within Five Miles of the Daley Farm, attached as Exhibit 5.
interference and cumulative adverse impacts. The EAW does not present information sufficient to determine the extent of the impact on surrounding public drinking water wells or to determine the cumulative impacts.

The MN DNR can issue water use permits only if “the proposed use will not harm ecosystems.”74 The preliminary well assessment75 states that the proposed wells present concerns that it will impact:

- An unnamed trout stream tributary to the Whitewater River,
- Rush Creek, a DNR designated trout stream, and
- Several non-DNR Protected Streams near the proposed well.

DNR also noted that Wilsons’ Phalarope, a State Species of Concern, was documented 1.9 miles from the site of the proposed wells. The EAW, however, does not present information sufficient to determine the extent of the impact on these surface waters.

The MN DNR is also required to consider the long-term impacts of water use permits. Minn. Statute § 103G.287, subd. 5 states:

The commissioner may issue water-use permits for appropriation from groundwater only if the commissioner determines that the groundwater use is sustainable to supply the needs of future generations.

A determination of the sustainability of the water supply necessitates consideration of current uses and the proposed use relative to the rate the affected aquifers will recharge or refill. The EAW does not provide the information needed to determine the impact of current uses on groundwater in the region or project the impact of the proposed use.

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74 Minn. Stat § 103G.287, subd. 5.
75 DNR Well Construction Preliminary Assessment; Tracking No. 2017-4001; T106N-R9W-S16 SENW; Winona County.
MN DNR maintains a network of observation wells across the state to track groundwater levels in key aquifers. No observation wells are located near the Daley Farm, and those located closest to the Daley Farm do not provide sufficient information to determine the current sustainability trends or the potential impact the Daley wells may have on water availability in the area. See Table 2. The Observation wells shown on Table 2 are located closest to the Daley Farm. Few of the Observation Wells are currently monitoring the same aquifers the proposed wells are likely to impact, and those that do are too new to indicate the long-term trends in water availability in the aquifer.

The MN DNR can require new water use applicants to install observation wells or other monitoring equipment to monitor the impacts of those appropriations. 76 Without such observation wells or modern technology that allows for automatically measuring and reporting the static water level of active wells, there is not enough information to determine the impact that the Daley Farms is having on groundwater sustainability in a region with a currently insufficient network.

Table 2: Observation wells located nearest to the Daley Farm.

<table>
<thead>
<tr>
<th>Obs. Well Number</th>
<th>Name</th>
<th>Period of Record</th>
<th>Depth</th>
<th>Status</th>
<th>Aquifer</th>
</tr>
</thead>
<tbody>
<tr>
<td>85000</td>
<td>MTP_L at Saint Charles ST. CHARLES 1</td>
<td>1973-10-26 to 1982-9-24</td>
<td>175 (drilled to 60 in 1892 then backfilled)</td>
<td>Sealed</td>
<td>multiple</td>
</tr>
<tr>
<td>85003</td>
<td>CJDN in Utica, Whitewater WMA</td>
<td>2016-10-25 to 2018-9-25</td>
<td>:05</td>
<td>Active</td>
<td>Jordan</td>
</tr>
<tr>
<td>85002</td>
<td>CMTS at Winona, Winona 7</td>
<td>2010-1-19 to 2011-8-31</td>
<td>-51</td>
<td>Sealed</td>
<td>Mt. Simon</td>
</tr>
<tr>
<td>23002</td>
<td>CMTS at Rushford Village, Peterson Fish Hatchery</td>
<td>2001-10-25 to 2015-2-28</td>
<td>643</td>
<td>Not Actively Read</td>
<td>Mt. Simon</td>
</tr>
<tr>
<td>55010</td>
<td>OGAL in Marion; Marion Res Area</td>
<td>2016-10-25 to 2018-8-23</td>
<td>60</td>
<td>Active</td>
<td>Prosser</td>
</tr>
<tr>
<td>23004</td>
<td>OPDC at Chatfield, Mill Part Pdc</td>
<td>2012-12-6 to 2018-10-18</td>
<td>148.3</td>
<td>Active</td>
<td>Prairie du Chien</td>
</tr>
<tr>
<td>23001</td>
<td>OPCJ at Chatfield, FILMORE COUNTY SHOP</td>
<td>1989-11-29 to 2012-11-29</td>
<td>284</td>
<td>Not Actively Read</td>
<td>Prairie du Chien</td>
</tr>
</tbody>
</table>

76 Minn. Stat. § 103G.282.
The Daley Farms EAW states that the proposed project will include drainage tile around the manure lagoons. However, the EAW does not include a plan to apply for a water use permit or state why such a permit is not required. Minn. Rule 6115.0620 allows for an exception for agricultural field tile but does not allow for an exception in the case of dewatering. The project proposal and EAW need to state explicitly why a permit is not required under Minn. Rule 6115.0620 (e.g., the withdrawal is less than 10,000 gallons per day and less than 1 MGY) or include the permit application in the project proposal. If a permit(s) is required for dewatering the additional requirements of Minn. Rule 6115.0710 must also be met, including showing that the “excess water can be discharged without adversely affecting the public interest.” This assurance includes that the capacity of the manure lagoons will not be exceeded by the of the discharged water or that the stormwater holding basins will not discharge untreated manure to waterways due to the dewatering discharge.

Based on this information, the lack of information in the EAW, and on the information that MCEA has gathered that suggests that additional wells and resources may be interfered with if this proposed water appropriation is allowed to proceed, MPCA has insufficient information to make a “reasoned decision about the potential for, or significance of” impacts from this proposed project on groundwater.\textsuperscript{77} MPCA must therefore delay its decision or order an EIS.

VI. **THE EAW DOES NOT CONTAIN ANY MEANINGFUL ASSESSMENT OF THE PROJECT’S COMPATIBILITY WITH APPROVED PLANS OF LOCAL UNITS OF GOVERNMENT**

Minnesota Rule 4410.1200 requires each EAW to include an “assessment of the compatibility of the project with approved plans of local units of government.”\textsuperscript{78} The Daley Farms EAW notes that the project as proposed is not consistent with local ordinances, which

\footnotesize{
\textsuperscript{77} Minn. R. 4410.1700, subp. 2a.
\textsuperscript{78} Minn. R. 4410.1200 (H).
}
prohibit feedlots in excess of 1,500 AU.\(^79\) In addressing this inconsistency, the EAW perfunctorily observes that “because the Project will increase Daley’s operations from 2,275.2 AU to 5,967.7 AU, Daley must apply for and receive a zoning variance from Winona County for the Project.”\(^80\) No other analysis or explanation is given, despite the regulatory directive to provide an assessment.

This omission is critical, for the local ordinances were specifically crafted to address and prohibit the situation present here, where a large feedlot that was “grandfathered in” proposes to expand even further. The Winona County feedlot ordinance was adopted to balance the County’s competing interests in “maintain[ing] a healthy agricultural community within the County while ensuring that farmers properly manage animal feedlots and animal wastes to protect the health of the public and the natural resources of Winona County.”\(^81\) To this end, the Zoning Ordinance allows nonconforming, pre-existing animal feedlots such as Daley Farms to continue to operate, but only as long as the number of animal units does not increase.\(^82\) The Ordinance’s provisions on non-conforming uses supplement this express intent, noting that “it is the intent of this section that all non-conformities shall be gradually eliminated and eventually brought into conformity.”\(^83\) Even more specifically, the Ordinance expressly forbids non-conforming uses of land from enlarging or increasing.\(^84\)

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\(^79\) EAW at 7.
\(^80\) Id.
\(^81\) Winona County, Minnesota, Zoning Ordinance § 8.1.1.
\(^82\) Id. § 8.2.1 (“A feedlot that is non-conforming because of excessive animal-unit numbers, which exists at the time of adoption of this Ordinance, may continue, if the number of animal units does not increase.”).
\(^83\) Id. § 3.2.1.
\(^84\) Id. § 3.2.3 (“A lawful, non-conforming use shall not be enlarged, but may be continued at the same size and in the same manner of operation as it existed on the date it became legally non-conforming except as hereinafter specified.”).
The express intent of the Zoning Ordinance to restrict feedlots to a maximum size and to eventually eliminate pre-existing nonconformities with this ceiling is the direct implementation of express policies in the 2014 Comprehensive Plan. The proposed expansion would be built in an area known for its karst topography, and the EAW confirms that many manure application sites contain karst features such as sinkholes, caves, and disappearing springs.\textsuperscript{85} The County Comprehensive Plan specifically addresses these circumstances, observing that “[b]ecause water moves very quickly in limestone formations and sinkholes with little or no purification by filtration, care must be used in preventing pollution in these areas. As a result, intense agricultural operations such as feedlot or solid waste disposal sites should be carefully regulated or prohibited in karst areas.”\textsuperscript{86} To address these concerns, the Plan states that the policy of the County is to “[c]arefully control the location and size of feedlots and other animal confinement areas in the County to minimize pollution and nuisance problems using acreage for manure spreading to determine carrying capacity and develop a fair and equitable permit system.”\textsuperscript{87}

The specific language of this policy referencing “carrying capacity” is especially worthy of notice. Feedlot manure is expensive to transport, and virtually all of a feedlot’s manure is applied to fields within 3-5 miles of the facility itself. In areas of high concentration of feedlot animals, then, the local fields can become effectively saturated with manure. In Utica Township, where the expansion would be built and the manure applied, almost half of private wells already test over the health limit of 10 mg/L nitrate.\textsuperscript{88} The public water supply for Utica was already

\textsuperscript{85} EAW at 10.
\textsuperscript{87} Comp. Plan at 18.
contaminated with nitrate at levels “far exceeding the drinking water limit,” forcing the Township to drill a deeper well that also consistently shows elevated concentrations of nitrate, but at levels below the limit. The primary source of this contamination is from the application of commercial fertilizers and manure to croplands.

Winona County's Comprehensive Plan is clear that the policy of the County is to “maintain groundwater nitrate level at a point which is equal to or less than the drinking water standard of 10 parts per million or in accordance with State Standards.” An “assessment of the compatibility of the project” with the comprehensive plan must therefore contain some assessment of how the project as proposed would possibly be consistent with these clearly stated policies.

Likewise, Winona County the may not issue a Conditional Use Permit (CUP) for the Daley Expansion if it does not comply with the County’s Comprehensive Plan. Winona County had denied conditional use permits for smaller farms (800 AU) in the same area and the Court of Appeals has upheld this denial based on the comprehensive plan, in particular the requirement that “intense agricultural uses such as feedlots . . . should be carefully regulated or prohibited entirely” in areas consisting of Karst geology where the groundwater is very susceptible to pollution. The Court of Appeals further found that Winona County had appropriately denied the 800 AU farm discussed above due to the significant risk to water quality due the number of

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89 EAW at 18.
90 MRWW WRAPS at 36.
91 Comp. Plan at 34.
92 Id. at § 5.5.4.3. Winona County also must provide a conditional use permit (CUP). EAW at 20. When deciding whether to grant a CUP, the board should consider the effect of the Daley Expansion on the health, safety and general welfare of occupants of surrounding lands. Comp. Plan at § 5.5.4.3.
93 Anderson v. Winona County board of Commissioners, Unpublished Opinion Minnesota Court of Appeals Case No. C2-00-537, December 5, 2000.
sinkholes in the area; location in the “High Probability” sinkhole area; concern for the City of Utica wells.\textsuperscript{94} Daley Farms is similarly close to the City of Utica and located in an area with “high” sinkhole probability.\textsuperscript{95} 

\textbf{VII. THE EAW LACKS INFORMATION ABOUT DALEY’S COMPLIANCE HISTORY AND ASSESSMENT OF WHETHER ONGOING NONCOMPLIANCE WITH NPDES PERMIT REQUIREMENTS AND REMEDIATION OF POLLUTION HAZARDS SHOWS A RISK SIGNIFICANT ENVIRONMENTAL RISKS NOT BEING ADDRESSED.}

The Daley Farms poses significant and ongoing risks to the environment by failing to timely remedy pollution hazards at its facilities and failing to meet the requirements of its NPDES permit and MMP.

In 2004, MPCA issued a notice of violation and compliance schedule to persuade Daley Farms to correct pollution hazards posed by bubbles and liner issues in its four manure lagoons.\textsuperscript{96} Since 1999, Daley had been aware of these large bubbles and knew that the bubbles indicated something was wrong with its basins. And by 2000 or 2001 Daley Farms believed that the basin liners had been “compromised.”\textsuperscript{97} In 2002, MPCA investigated an anonymous tip regarding a large bubble in the basin that reached nearly 30 feet in diameter, and Daley farms “admitted that it was more likely than not that the MPCA would require it to reline all four basins.”\textsuperscript{98} Yet it appears that as of October 2009, not all the work had been done yet to remedy this pollution hazard in at least one of the basins.\textsuperscript{99}

\textsuperscript{94} Id.
\textsuperscript{95} Geologic Atlas of Winona County, Minnesota, County Atlas Series, Atlas C-2, Plate 5 of 8 Sinkhole Probability, University of Minnesota Geological Survey, attached as Exhibit 6.
\textsuperscript{96} Letter to Ben Daley dated November 19, 2004 and Schedule of Compliance between Daley Farms of Lewiston, LLP and MPCA, attached as Exhibit 7.
\textsuperscript{97} Daley Farms of Lewiston, LLP v. Arlo Habben, et. al., Unpublished Opinion, Minnesota Court of Appeals Case No A 07-1050, May 20, 2008.
\textsuperscript{98} Id.
\textsuperscript{99} Inspection Form, October 6, 2009, attached as Exhibit 8.
In October 2009, MPCA notified Daley Farms that it was illegally operating two open feedlots and that there was a potential for contaminated leachate and feed pad runoff to reach surface waters.\textsuperscript{100} But as of the time the current Draft permit was proposed, Daley had not yet remedied those issues, despite a Compliance Schedule in Daley Farm’s 2010 NPDES permit requiring feed storage runoff controls and open lot runoff controls by January 1, 2014.\textsuperscript{101} Instead of requiring compliance with that deadline, it appears that MPCA extended the timeline for compliance when it issued Daley Farm’s a new NPDES permit in 2016.\textsuperscript{102} The 2016 Compliance Schedule required the feed pad runoff leachate collection system to be complete by October 1, 2017, open lot runoff controls constructed at Site 1 by October 1, 2019, and open lot runoff control completed at Site 7 by October 1, 2020.\textsuperscript{103} And rather than requiring Daley Farms to actually meet these compliance dates for open lot runoff controls MPCA now proposes to allow Daley Farms to continue to operate these pollution hazards for yet another year. The current draft permit does not require Daley to construct the open lot runoff controls, until October 1, 2021.\textsuperscript{104} MPCA has provided no justification for this extended compliance schedule in its permitting documents.

Finally, Daley Farms has not kept up with its permit commitments pertaining to land-spreading of liquid manure. In 2013, MPCA notified Daley Farms that its land application records showed Daley had applied liquid manure at rates 20\% higher than allowed by rule.\textsuperscript{105} In 2015, Winona County became aware that Daley Farms had not completed a manure nutrient analysis, which is essential to determining proper application rates, for more than four years, as

\begin{itemize}
  \item \textsuperscript{100} Id.
  \item \textsuperscript{101} 2010 Daley Farms NPDES permit, at III.B.4.
  \item \textsuperscript{102} 2016 Daley Farms NPDES permit, at 3.1.1.3.
  \item \textsuperscript{103} Id.
  \item \textsuperscript{104} Draft Permit, at 3.2.1.4 and 3.2.1.5.
  \item \textsuperscript{105} Letter from MPCA to Ben Daley dated December 26, 2012, attached as Exhibit 9.
\end{itemize}
required by Minnesota Rule 7020.2225, subp. 2.106 And more recently, MPCA has noted that Daley Farms had not supplied appropriate records of the dates and amount of manure applied by the facility.107

VIII. CONCLUSION

For the reasons given above, MPCA must order an EIS. The EAW for the Daley Expansion simply lacks sufficient information to support a finding that the project does not have the potential to cause significant environmental impacts. Therefore an EIS must be ordered.108 While this alone compels a decision to require an EIS, at the very least the lack of complete information supports the need to either “make a positive declaration and include within the scope of the EIS appropriate studies to obtain the lacking information” or “postpone the decision on the need for an EIS, for not more than 30 days or such other period of time as agreed upon by the RGU and proposer, in order to obtain the lacking information.”109 For all of the foregoing reasons, an EIS is needed to prevent this facility from causing significant environmental impacts that threaten water quality and public health.

Respectfully submitted,

/s/ Betsy Lawton
Betsy Lawton
Kevin P. Lee
Minnesota Center for Environmental Advocacy
1919 University Ave. W., Ste. 515
St. Paul, MN 55104
blawton@mncenter.org
klee@mncenter.org

Attorneys for Minnesota Center for Environmental Advocacy

106 Letter from Winona County to Ben Daley dated September 18, 2015, attached as Exhibit 10.
107 MPCA Feedlot NPDES/SDS Permitted Facility Inspection Checklist re Daley Farms of Lewiston LLP 1 dated September 6, 2016, attached as Exhibit 11.
108 Minn. R. 4410.2000, subp. 3, 4410.1700, subp. 1.
109 Minn. R. 4410.1700, subp. 2a.
EXHIBIT 1
Comment on
Daley Farms of Lewiston, LLP: 2018 Dairy Expansion - EAW (p-ear2-143i)

By
E. Calvin Alexander Jr.
Morse Alumni Professor Emeritus
Earth Sciences Department
University of Minnesota
116 Church Street SE
Minneapolis, MN 55455

Introduction:

The proposed Daley Farms expansion, if approved and constructed, will create a significant environmental risk to the Lewiston area. The site is surrounded by many sinkholes. Many of the wells in the first two aquifers under the area are already at or above the nitrate-nitrogen drinking water standard. The Lewiston Waste Water Treatment Lagoon catastrophically collapsed (Jannik et al., 1992). The failed lagoon is about 1.8 miles southeast of the Daley Farms site -- at approximately the same elevation and in the same hydrogeologic stratigraphic environment.

Mapped Sinkhole:

There is a mapped sinkhole, MN85:D00422 (hereafter D422), in the Minnesota Karst Features Data base that is about 450 feet from the existing manure storage lagoons at the Daley Farm operations. The feature is readily visible on historic air photos and is shown as a pond on the USGS topo sheet of the area. “The Daley Family describes the feature as a landfill that was miss-classified as a sinkhole in the 1980s and they do not recall any subsidence during the years they have lived on the farm.” (Dogwiler, 2015, p. 6) That feature was later filled as part of a grassed water way construction. Two Electrical Resistivity Imaging lines (ERI) were conducted at the site by Professor Toby Dogwiler (then at Winona State University -- currently at Missouri State University, Springfield, MO) in April 2015. Professor Dogwiler’s ERI specifically ran two ERI lines across the mapped location of D422. Those two lines are reproduced below as Professor Dogwiler’s Figures 12 and Figure 11.

Figure 12, the ERI line down the axis of the grassed waterway, shows an approximately 30 m deep pit in the bedrock surface at D422’s location (shown by the added dashed rectangle in Figure 12). Professor Dogwiler interpreted this apparent bedrock pit as an artifact of the disturbed and compacted materials used to fill the depression before and during the construction of the grassed waterway. Last week at the 2018 Geological Society of America’s annual meeting in Indianapolis, IN, I discussed the Daley Farms ERI study with Professor Dogwiler. He quickly reviewed his interpretation and said that he was comfortable with his interpretation of the line -- but would check with a couple of his ERI mentors to see what they felt about his interpretation.
Professor Dogwiler, however, was not aware of the EAW for an expansion to almost 5000 dairy cows. In view of that proposal, given that development he recommended that the ERI results from his lines 5 and 6 below should be ground truthed with deep drilling and/or deep backhoe excavations. I share that recommendation and it was supported by two karst hydrogeologists who routinely use ERI to characterize sites in karst who looked at the Daley Report at my request.

**ERI Images of D422**

Reproduced below are the two ERI lines crossing mapped sinkhole D422 from Dogwiler’s (2015) Daley Farms study. The area of the mapped sinkhole is outlined in the black dashed rectangle. Dogwiler’s Fig. 12 (line 6) ran down the axis of the grassed waterway through D422. This figure shows the prominent, roughly 30 m deep, apparent pit in the surface of the red bedrock. This is the feature Professor Dogwiller interpreted as an artifact of the compacted fill near the surface.

![Figure 12. A profile of ERI Line 6 (see Figures 1 and 2 for the location of the line and Figure 7 for an overview of interpreting ERI profiles and the characteristics of different types of ERI arrays).](image)

Professor Dogwiller’s Figure 11 (line 5) below was run across the location of D422 perpendicular to line 6. The near surface, red, compacted fill in not evident in this ERI line but there is still a clear, roughly 10 m deep depression in the surface of the bedrock -- consistent with D422 being a filled sinkhole.
Recommendation:

Given the prominent karst features all around the Daley Farms site, the nearby catastrophic collapse of the Lewiston Waste Water Treatment Lagoon on similar karst stratigraphy, the documented growing nitrate pollution of Lewiston’s wells and many local wells, and the enormous size of this proposed CAFO this facility should not be permitted at this site without a full scale EIS.

If this EAW is approved it should be contingent on a deep excavation of the D422 feature to check Professor Dogwiller’s interpretation. Simple soil borings to “refusal” will not be sufficient. Given that the Daley’s used the site as a landfill before it was converted to a grassed waterway, there are probably metal or
demolition debris in the fill that will stop a soil boring. An extensive, deep excavation of D422 will be necessary to document what the feature actually is.

If it is a filled sinkhole, the expansion should not be permitted.

References:
EXHIBIT 2
Manure Application Acres Proposed at Daley Farms & Drinking Water Supply Management Area Vulnerability

Site
- Daley Farm Site

Manure Acres
- Daley Farms Proposed Application Acres

Existing Feedlots

Animal Unit (AU) Count
- 0 (No Data)
- 1-150
- 150-300
- 300-1,000
- 1,000-5,000

Drinking Water Supply Vulnerability
- High
- Moderate
- Low
- Wellhead Protection Area

Map produced by Andra Mathews at MCEA on October 29, 2018. Map data sources include feedlots from the MN Pollution Control Agency, wellhead protection areas and drinking water supply management area (DWSPA) vulnerability from the MN Department of Health, and basemap aerial imagery from MNCEQ with distance buffers from Daley Farms proposed site, and application acres digitized from the EAW for Daley Farms (2018) at a scale of 1:10k in ArcGIS Desktop (v10.5). Map produced in ArcMAP, v10.5, ESRI 2017. This map is meant for illustrative purposes only. MCEA is not responsible for any inaccuracies herein contained.
EXHIBIT 3
NOAA Atlas 14, Volume 8, Version 2
Location name: Lewiston, Minnesota, USA*
Latitude: 43.9843°, Longitude: -91.9038°
Elevation: 1200.11 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES
Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yeka, Geoffrey Bonnin
NOAA, National Weather Service, Silver Spring, Maryland

PF tabular | PF graphical | Maps & aerials

### PF tabular

<table>
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<th>Duration</th>
<th>Average recurrence interval (years)</th>
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15-min   0.536   (0.414-0.887)
10-min   0.629   (0.485-0.806)
4-day    3.48
6-hr     1.98   (0.503-0.837)
3-hr     1.69   (0.767-0.983)
30-min   0.923   (0.712-1.18)
60-min   1.22   (0.938-1.56)
2-hr     1.51   (1.18-1.92)
12-hr    2.23   (1.78-2.77)
24-hr    2.53   (2.03-3.11)
2-day    2.94   (2.39-3.59)
3-day    3.23   (2.64-3.93)
4-day    3.48   (2.85-4.22)
7-day    4.11   (3.40-4.95)
10-day   4.67   (3.88-5.59)
20-day   6.29   (5.27-7.46)
30-day   7.70   (6.50-9.10)
45-day   9.58   (8.12-11.3)
60-day   11.2   (9.57-13.2)

1 Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

### PF graphical
Table 3: Wells listed in the Minnesota Well Index located in adjacent Township Sections to the Daley Farm.

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<th>Well Number</th>
<th>Well Name</th>
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EXHIBIT 5
Table 4: Groundwater appropriations from the MPARS system within five miles of the Daley Farm.

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<th>Use Type</th>
<th>Use in 2017 (mg)</th>
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EXHIBIT 6
EXHIBIT 7
November 19, 2004

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Ben Daley
Daley Farms of Lewiston, LLP
18774 Highway 14
Lewiston, MN  55952

RE: Executed Schedule of Compliance / Failure to Comply with Part 7, subparts e and f

Dear Mr. Daley:

The executed Schedule of Compliance (Agreement), dated September 15, 2004, required Daley Farms of Lewiston, LLP, (Regulated Party), to submit to the Minnesota Pollution Control Agency (MPCA) an updated manure management plan and a plan to address the pollution hazards created by the liquid manure storage basins known as basin numbers 1, 3, and 4.  The deadline to submit these items was within 60 days of the execution of the Agreement or November 15, 2004.  To date, the Regulated Party has not submitted either of these items.

Part 8, subpart b of the Agreement states that if the Regulated Party fails to comply with the requirements in Part 7, subparts d – f of the Agreement, the Regulated Party will pay a penalty in the amount of $150 per requirement for each day of failure.  Penalties shall accrue from the date that the Regulated Party was to have fulfilled the requirement until the Regulated Party fulfills the requirement.

Part 7, subpart e of the Agreement required the Regulated Party to submit an updated manure management plan to the MPCA.  The plan does not have to be submitted at this time.  The liquid manure storage basin known as basin number 2 is near completion and should soon be fully functional; therefore there will be no loss of manure storage going into the winter months.  Penalties allowed by Part 8, subpart b of the Agreement shall not accrue.

Part 7, subpart f of the Agreement required the Regulated Party to submit a plan to address the pollution hazards created by basin numbers 1, 3 and 4, by November 15, 2004.  The plan has not be received by the MPCA and therefore, penalties of $150 per day have accrued since November 15, 2004, and will continue to accrue through the date the Regulated Party fulfills the requirement.
Once the Regulated Party submits the plan required by Part 7, subpart f of the Agreement, the Regulated Party will receive written notice from the MPCA requesting payment of the penalty accrued for the non-compliance. The Regulated Party is required to pay the requested penalty within 30 days after receiving written notice that the penalty is due.

Please submit the plan required by Part 7, subpart f of the Agreement to Robert Kostinec at the MPCA’s Rochester Office; 18 Wood Lake Drive SE, Rochester, MN  55904.

If you have any questions about this letter or the Agreement, please contact me at (218) 846-0498. If you have question regarding the information that must be contained in the plan required by Part 7, subpart f of the Agreement, please contact Robert Kostinec at (507) 285-7305.

Sincerely,

Lisa M. Scheirer
Regional Division
Detroit Lakes Office

LMS:

cc: Michael Tiry, P.E., Tiry Engineering, Chippewa Falls, WI
    Douglas Boese, Attorney at Law, Dunlap & Seeger, P.A., Rochester
    Robert Kostinec, MPCA Rochester
    Jerry Hildebrandt, MPCA, Rochester
Part 1.  **PARTIES.** This Schedule of Compliance ("Agreement") applies to and is binding upon the following parties:

a. Daley Farms of Lewiston, LLP ("Regulated Party"); and

b. The Minnesota Pollution Control Agency ("MPCA").

Unless specified otherwise in this Agreement, where this Agreement identifies actions to be taken by the MPCA, the Commissioner or the Commissioner’s designees shall act on the MPCA's behalf.

Part 2.  **PURPOSE AND SCOPE OF SCHEDULE OF COMPLIANCE.** The purpose of this Agreement is to resolve the alleged violations set out in Part 6 of this Agreement by specifying actions the Regulated Party agrees to undertake. By entering into this Agreement, the Regulated Party is settling a disputed matter between itself and the MPCA and does not admit that the alleged violations set out in Part 6 of this Agreement occurred. However, the Regulated Party agrees that the MPCA may rely upon the alleged violations set out in Part 6 as provided in Part 10 of this Agreement. Except for the purposes of implementing and enforcing this Agreement, nothing in this Agreement constitutes an admission by either Party, or creates rights, substantive or procedural, that can be asserted or enforced with respect to any claim of or legal action brought by a person who is not a party to this Agreement.

Part 3.  **AUTHORITY.** This Agreement is entered under the authority vested in the MPCA by Minn. Stat. chs. 115 and 116.

Part 4.  **DEFINITIONS.** Unless otherwise explicitly stated, the definitions in Minn. Stat. chs. 115, 115A, 115B, 115C, 116, 116B and in Minn. R. chs. 7000 to 7150 apply, as appropriate, to the terms used in this Agreement.

Part 5.  **BACKGROUND.** The following is the background of this Agreement:
a. The Regulated Party is a Limited Liability Partnership and operates a 1,996 animal unit dairy facility located in the Section 16, Utica Township, Winona County, Minnesota, hereafter the "Facility."

b. Manure and process wastewaters produced at the Facility are stored in four liquid manure storage basins (Basins), each designed to be lined with 2.5 feet of compacted clay and 40 mil high density polyethylene (HDPE) material. For identification purposes, the Basins are known as Basin Numbers 1, 2, 3, and 4. The MPCA provided the Regulated Party the authorization to construct the Basins on November 17, 1999, with MPCA Feedlot Permit, MPCA-I 1748(A)R2.

c. On December 12, 2001, the Regulated Party was provided National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Permit coverage under the State of Minnesota General Livestock Production Permit; Permit Number MNG440074 (Permit).

d. The Basins have formed bubbles beneath the HDPE liners. The bubbles have damaged the HDPE liners and therefore, the liners are not functioning as designed.

e. The Regulated Party has not yet repaired damage to the HDPE Basin liners with similar materials and installation techniques as required by the Regulated Party’s manure management plan (MMP) or replaced the HDPE liners with other materials.

**Part 6. ALLEGED VIOLATIONS.** The MPCA alleges that the Regulated Party has violated the following requirements of statute, rule and/or permit condition:

**State of Minnesota General Livestock Production Permit NPDES/SDS Permit, Part 3.0, Prerequisite Plans for Submitting a Permit Application.**

The following documents are required as part of the general permit application in accordance with Minn. R. ch. 7020, and are incorporated as enforceable requirements of the permit. ...

3.3. A manure management plan (MMP) in accordance with Minn. R. 7020.2225, subp. 1 and subp. 4.
The MPCA alleges that the Regulated Party has not replaced the HDPE liner from Basin Number 2 or investigated whether the integrity of the HDPE liners from Basin Numbers 1, 3, and 4 have been damaged from the bubbles, as described in the MMP submitted with the Regulated Party’s Permit application.

**Part 7. REGULATED PARTY REQUIREMENTS.** The Regulated Party agrees to the following requirements:

a. Within 15 days of the execution date of the Agreement, the Regulated Party shall remove all manure and process wastewaters from Basin Number 2.

b. Within 15 days of the execution date of the Agreement, the Regulated Party shall discontinue use of Basin Number 2. No manure or process wastewaters shall be added to Basin Number 2 until the Basin has been re-constructed according to Minn. R. 7020.2100, and MPCA’s fact sheet titled, *Siting Manure Storage Areas in Minnesota’s Karst Region: State Requirements.*

c. Within 15 days of the execution date of the Agreement, the Regulated Party shall install a control device on the transfer pipe that leads from the barn to Basin Number 2, so that manure or processed wastewaters cannot be transferred from the barn to the Basin.

d. Within 60 days of the execution date of the Agreement, the Regulated Party shall close Basin Number 2 in accordance with Minn. R. 7020.2025, or submit to the MPCA for review and approval design plans and specifications for the reconstruction of Basin Number 2. The design plans and specifications must be prepared and submitted in accordance with Minn. R. 7020.2100, and MPCA’s fact sheet titled, *Siting Manure Storage Areas in Minnesota’s Karst Region: State Requirements.* Upon approval by the MPCA of the design plans and specifications, the design plans and specifications shall become an enforceable part of this Agreement and the Regulated Party shall implement each requirement and term in the design plans and specifications.

e. Within 60 days of the execution date of the Agreement, the Regulated Party shall submit to the MPCA for review and approval, an updated MMP. The updated MMP shall include a description of how manure and process wastewaters produced at the Facility will be managed due to the loss of storage from the unavailability of Basin Number 2. Upon approval by the MPCA, the MMP shall become an enforceable part of this Agreement and the Regulated Party shall implement each requirement and term in the MMP.
f. Within 60 days of the execution date of the Agreement, the Regulated Party shall submit to the MPCA for review and approval a plan to eliminate the pollution hazards created by Basin Numbers 1, 3 and 4. The plan shall be prepared by a professional engineer licensed in the state of Minnesota or a representative of the company that manufactured the Basin’s HPDE liners and shall include the following components: 1) methods that will be used to evaluate the structural integrity of the HDPE liners from Basin Numbers 1, 3 and 4; and 2) corrective or protective measures needed to restore the functionality of the liners from Basin Numbers 1, 3 and 4, as designed. Upon approval by the MPCA of the plan, the plan shall become an enforceable part of this Agreement and the Regulated Party shall implement each requirement and term in the plan.

Part 8. **PENALTIES FOR VIOLATIONS OF THIS AGREEMENT.**

a. If the Regulated Party fails to comply with requirements of Part 7, subparts a – c, of this Agreement, the Regulated Party shall pay to the MPCA a penalty in the amount of $250.00 per requirement for each day of failure.

b. If the Regulated Party fails to comply with requirements of Part 7, subparts d - f, of this Agreement, the Regulated Party shall pay to the MPCA a penalty in the amount of $150.00 per requirement for each day of failure.

c. Penalties for failure to comply with requirements of Part 7 of this Agreement shall accrue from the date the Regulated Party was to have fulfilled the requirement until the Regulated Party fulfills the requirement. Penalties shall not accrue while the MPCA considers a timely extension request under Part 13 or during dispute resolution under Part 11; unless the MPCA determines that the Regulated Party filed the request or initiated dispute resolution solely for purposes of delay. If the Regulated Party does not pursue dispute resolution under Part 11 for denial of a timely extension request, penalties shall accrue from the date the extension request is denied by the MPCA Case Contact. If the Regulated Party pursues dispute resolution for denial of an extension request and does not file a timely challenge in a court of competent jurisdiction as provided by Part 11, penalties shall accrue from the date of a Commissioner’s dispute resolution decision against the Regulated Party until the Regulated Party fulfills the requirement that is the subject of the extension request.
d. The Regulated Party shall pay a penalty under this Part within 30 days after receiving written notice from the MPCA that the penalty is due. The written notice shall specify the provision of the Agreement that the Regulated Party has not fulfilled and indicate the date penalties began to accrue. If the Regulated Party fails to make timely payment, the MPCA may assess and the Regulated Party agrees to pay a late payment charge, in addition to the stipulated penalty, to be assessed as follows. Forty-five days after receipt of written notice, the Regulated Party shall be obligated to pay a late charge in an amount equal to ten percent of the unpaid stipulated penalty. Sixty days after receipt of written notice, the Regulated Party shall be obligated to pay an additional late charge in an amount equal to twenty percent of the unpaid stipulated penalty.

e. In dispute resolution before the Commissioner under Part 11, the Regulated Party can contest the factual basis for the MPCA's determination that the Regulated Party has not fulfilled a requirement of this Agreement covered by this Part. However, the Regulated Party waives its right to challenge, on legal grounds, the requirement that it pay penalties under this Part.

f. The Regulated Party shall not be liable for payment of penalties for failure to comply with requirements of Part 7 of this Agreement covered by this Part if it has submitted to the MPCA a timely request for an extension of schedule under Part 13 and the MPCA has granted the request. The MPCA’s grant of an extension of schedule waives the payment of penalties covered by this Part only on the requirements for which the MPCA granted an extension of schedule and only for the time period specified by the MPCA in the grant of an extension. An extension of schedule for one requirement of Part 7 does not extend the schedule for any other requirement of Part 7.

g. Any requirement of this Agreement may be enforced as provided in Minn. Stat. § 115.071 (2002). Payment of a stipulated penalty does not relieve the Regulated Party of its obligation to fulfill and complete requirements under the Agreement and to otherwise comply with the terms and conditions of the Agreement.

Part 9. **COVENANT NOT TO SUE AND RESERVATION OF REMEDIES.** With respect to the Regulated Party, the MPCA agrees not to exercise any administrative, legal or equitable remedies available to the MPCA to
address the violations alleged and described in Part 6 as long as the Regulated Party performs according to and has complied with the terms, covenants and agreements contained in this Agreement. The MPCA reserves the right to enforce this Agreement or take any action authorized by law, if the Regulated Party fails to comply with the terms and conditions of this Agreement. Further, the MPCA reserves the right to seek to enjoin violations of this Agreement and to exercise its emergency powers pursuant to Minn. Stat. § 116.11 (2002) in the event conditions or the Regulated Party’s conduct warrant such action. Nothing in this Agreement shall prevent the MPCA from exercising these rights nor and nothing in this Agreement constitutes a waiver of these rights.

The Regulated Party agrees to waive all claims it may now have, as of the effective date of this Agreement, under Minn. Stat. § 15.472 for fees and expenses arising out of matters leading up to and addressed in this Agreement.

Part 10. REPEAT VIOLATIONS. Federal and state environmental programs establish harsher penalties for violations of environmental laws or rules that constitute repeat violations. In a proceeding to resolve alleged violations by the Regulated Party, if any, occurring after the date of the alleged violations set out in Part 6 of this Agreement, the Regulated Party may argue about the extent to which the violations alleged in Part 6 of this Agreement should affect the penalty amount for the later violations, but waives the right: 1) to contend that the violations alleged in Part 6 of this Agreement did not occur as alleged; and 2) to require the MPCA to prove the violations alleged in Part 6 of this Agreement.

Part 11. RESOLUTION OF DISPUTES. The parties to this Agreement shall resolve disputes that arise as to any part of the Agreement as follows:

a. Either party, acting through its case contact, may initiate dispute resolution by providing to the case contact of the other party an initial written statement setting forth the matter in dispute, the position of the party, and the information the party is relying upon to support its position. The other party, acting through its case contact, shall provide a written statement of its position and supporting information to the case contact of the initiating party within 14 calendar days after receipt of the initial written statement.

b. If the parties, acting through their case contacts, do not reach a resolution of the dispute and reduce such resolution to writing in a form agreed upon by the parties within 21 calendar days after the
initiating party receives the statement of position from the responding party, the Commissioner shall issue a written
decision resolving the dispute. The written decision may address stipulated penalties assessed pursuant to Part 8.
The Commissioner's decision shall be considered a final decision of the MPCA for purposes of judicial review.

c. The Commissioner's decision shall become an integral and enforceable part of this Agreement unless the
Regulated Party timely challenges the decision in a court of competent jurisdiction. Failure to timely
challenge means the Regulated Party agrees to comply with the MPCA Commissioner’s decision on the matter in
dispute and to pay any penalties that accrue pursuant to Part 8 for failure to fulfill requirements of this Agreement
that are the subject of the dispute resolution. Further, if the Commissioner’s decision assesses penalties pursuant to
Part 8 of this Agreement, the Regulated Party agrees to and shall pay the amount of penalty determined by the
Commissioner within 60 days after receiving the Commissioner’s decision.

d. Throughout any dispute resolution, the Regulated Party shall comply with all portions of the Agreement that the MPCA determines are not in dispute.

Part 12. VENUE. Actions brought by the MPCA to enforce requirements and terms of this Agreement shall be
venued in Ramsey County District Court.

Part 13. EXTENSION OF SCHEDULES. If the Regulated Party wants an extension of a deadline included in a
schedule set out in Part 7, the Regulated Party must request the extension in writing at least ten days before the
scheduled deadline, or as soon as possible before that date if the reason for the extension request arises less than ten
days before the deadline. Each deadline extension request shall separately specify the reason why the extension is
needed. No requested extension shall be effective until approved in writing by the MPCA, acting through the
MPCA Case Contact or the Commissioner. The MPCA shall grant an extension only for the period of time the
MPCA determines is reasonable under the circumstances. The written approval or grant of an extension request
shall be considered an enforceable part of the Agreement.

The Regulated Party has the burden of demonstrating to the satisfaction of the MPCA that the request for
the extension is timely, and that good cause exists for granting the extension. Good cause can include, but is not
limited to, the following:

a. circumstances entirely beyond the reasonable control of the Regulated Party; and
b. delays caused by the MPCA in reviewing timely submittals required by this Agreement, the Regulated Party submitted in complete and approvable form, which make it not feasible for the Regulated Party to meet the required schedules.

Good cause does not include unanticipated costs, increases in the cost of control equipment, or delays in MPCA review of submittals when the submittals are not in complete and approvable form.

The Regulated Party may challenge a decision by the MPCA to deny a request for an extension under Part 11.

Part 14. CASE CONTACT. The MPCA and the Regulated Party shall each designate a Case Contact for the purpose of overseeing the implementation of this Agreement. The MPCA Case Contact is: Lisa Scheirer. The Regulated Party’s Case Contact is: Ben Daley. Either party may change its designated Case Contact by notifying the other party in writing, within five days of the change. To the extent possible, communications between the Regulated Party and the MPCA concerning the terms and conditions of this Agreement shall be directed through the Case Contacts. The address and telephone Number of the MPCA’s Case Contact is:
714 Lake Avenue, Suite 220, Detroit Lakes, MN  56501 (218) 846-0498.

Part 15. REGULATED PARTY INFORMATION. The Regulated Party shall not knowingly make any false statement, representation or certification in any record, report, plan or other document filed or required to be submitted to the MPCA under this Agreement. The Regulated Party shall immediately upon discovery report to the MPCA any errors in such record, report, plan or other document.

Part 16. REVIEW OF SUBMITTALS. The MPCA, acting through its Commissioner, Case Contact, or other designated MPCA staff, shall review all submittals made by the Regulated Party as required by this Agreement and shall notify the Regulated Party in writing of the approval or disapproval of each submittal. The MPCA and the Regulated Party shall consult with each other upon the request of either party during the review of submittals or modifications. If any submittal is disapproved in whole or in part, the MPCA Commissioner or designated MPCA staff shall notify the Regulated Party of the specific inadequacies and shall indicate the necessary amendments or reviews. Within 15 calendar days after receipt of any notice of disapproval, the Regulated Party shall submit revisions and take actions to correct the inadequacies.
Part 17. **ACCESS.** During the term of this Agreement, the Regulated Party agrees to provide the MPCA and its staff access to the Facility and its records and documents related to the implementation of this Agreement to the extent provided under Minn. Stat. § 116.091 (2002) or other law, conditioned only upon the presentation of credentials.

Part 18. **SAMPLING AND DATA AVAILABILITY.** The Regulated Party shall make available to the MPCA the results of any sampling, tests, or other data generated by the Regulated Party, or on its behalf, to implement the requirements of this Agreement.

Part 19. **RETENTION OF RECORDS.** The Regulated Party shall retain in its possession all records and documents related to this Agreement. The Regulated Party shall preserve these records, documents, reports and data for a minimum of three years after the termination of this Agreement despite any document retention policy of the Regulated Party to the contrary, and shall promptly make all such documentation available for review upon request by the MPCA.

Part 20. **APPLICABLE LAWS AND PERMITS.** The Regulated Party shall undertake all actions required to be taken pursuant to this Agreement in accordance with the requirements of all applicable state and federal laws and regulations. Except when the MPCA has specified and authorized a different compliance method in Part 7, the Regulated Party must also comply with all applicable permits, orders, stipulation agreements and schedules of compliance. Nothing in this Agreement exempts or relieves the Regulated Party of its obligation to comply with local governmental requirements.

Part 21. **OTHER CLAIMS.** Nothing herein shall release the Regulated Party from any claims, causes of action or demands in law or equity from any person, firm, partnership or corporation not a signatory to this Agreement for any liability it may have arising out of or relating to the release of any pollutant or contaminant from its operations or from a facility. Neither the Regulated Party nor the MPCA shall be held as a party to any contract entered into by the other party to implement the requirements of this Agreement.

Part 22. **HOLD HARMLESS AGREEMENT.** The Regulated Party agrees to indemnify, save and hold the MPCA, its agents and employees harmless from any and all claims or causes of action arising from or on account of acts or omissions of the Regulated Party, its officers, employees, agents, or contractors in implementing the
activities conducted pursuant to this Agreement; provided, however, that the Regulated Party shall not indemnify
the MPCA or save or hold its employees and agents harmless from any claims or causes of action arising out of the
acts or omissions of the MPCA, or its employees and agents. When the Regulated Party is required to hold the
MPCA harmless, the MPCA shall give the Regulated Party notice of any claim or cause of action subject to this Part
and the Regulated Party has the right to participate in the defense against any claim or cause of action. No
settlement shall be effective against the Regulated Party unless the Regulated Party agrees to the settlement.

Part 23. SUCCESSORS. This Agreement shall be binding upon the Regulated Party and its successors and
assigns and upon the MPCA, its successors and assigns. If the Regulated Party sells or otherwise conveys or
assigns any of its right, title or interest in the Facility, the conveyance shall not release the Regulated Party from any
obligation imposed by this Agreement, unless the party to whom the right, title or interest has been transferred or
assigned agrees in writing to fulfill the obligations of this Agreement and the MPCA approves the transfer or
assignment.

Part 24. AMENDMENTS. Except with respect to extensions of schedules granted under
Part 13 and approved submittals under Part 16, this Agreement may be amended only by written agreement between
the parties.

Part 25. EFFECTIVE DATE. This Agreement shall be effective on the date it is signed by the MPCA.

Part 26. TERMINATION. The provisions of this Agreement shall be deemed satisfied and terminated when the
MPCA notifies the Regulated Party in writing that an Individual NPDES/SDS Permit has been issued to the
Regulated Party. The Regulated Party agrees that all of the provisions of Part 7 of this Agreement may be
incorporated as enforceable parts of the Individual NPDES/SDS Permit.

Part 27. SURVIVAL. The provisions of Parts 2, 9, 10, 15, 18, 19, 20, 21, 22, 23, and 27 of this Agreement and
the rights, duties and obligations of the MPCA and the Regulated Party created in those provisions shall survive
termination of this Agreement.
BY THEIR SIGNATURES BELOW, THE UNDERSIGNED REPRESENT THAT THEY HAVE AUTHORITY TO BIND THE PARTIES THEY REPRESENT, AND THEIR AGENTS, CONTRACTORS, AND SUBSIDIARIES

DALEY FARMS OF LEWISTON, LLP

By: __________________________
Name: _________________________
Title: __________________________
Date: __________________________

STATE OF MINNESOTA
MINNESOTA POLLUTION CONTROL AGENCY

By: __________________________________________
Katherine Logan, Supervisor
Regional Environmental Management Division
Rochester Office

Date: __________________________
EXHIBIT 8
## Inspection Form NPDES/SDS Permitted Facilities

<table>
<thead>
<tr>
<th>Owner/Operator:</th>
<th>Ben Daley</th>
<th>Date of Inspection:</th>
<th>10/6/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility Name:</td>
<td>Daley Farms of Lewiston LLP</td>
<td>Inspector Name:</td>
<td>Steve Schmidt</td>
</tr>
<tr>
<td>Registration No.:</td>
<td>169-50002</td>
<td>Others Present:</td>
<td>John Pokorney MPCA Brainerd Office; Mark Gernes Winona County Feedlot Officer</td>
</tr>
<tr>
<td>Permit No.:</td>
<td>MN0067652</td>
<td>Type(s) of Animals:</td>
<td>Mature Dairy Cattle</td>
</tr>
<tr>
<td>Qtr.:</td>
<td>NE</td>
<td>Sect.:</td>
<td>16</td>
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<tr>
<td>Twp.:</td>
<td>Utica</td>
<td>Registered Number:</td>
<td>1426</td>
</tr>
<tr>
<td>County:</td>
<td>Winona</td>
<td>Number of Animals</td>
<td>1426</td>
</tr>
</tbody>
</table>

### Livestock Production Area Facility Review

#### A. Animal Confinement Areas Operation & Maintenance

1) **All Barns**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>NA</th>
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<tbody>
<tr>
<td>☑</td>
<td>☑</td>
<td>X</td>
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Issues:  
Ventilation fans kept clean of built-up dust, feathers, or other debris?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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Evidence of manure seepage from barn?

Upslope clean water diverted around or away from barn(s)?

#### B. Solid Manure Storage Areas Operation & Maintenance

1) **Short-term Stockpile**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>NA</th>
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Issues:  
Stockpile within required setback zones?
Located in sand/gravel quarry or bedrock?
Are pile slopes < 3:1 or <15% solids?
Located on greater than 6% slope?
Located on 2-6% slope without clean water diversion and erosion control practices?
Are saturated soils within 2 feet?
Are coarse-textured soils present throughout top 5 feet at stockpile location?
Are soils bare—without vegetation for one year pre/post-use?
Has this site been used longer than one year?
Does amount in stockpile require over 320 ac. to land apply?

2) **Permanent Stockpile**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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</table>

Issues:  
Stockpile within required setback zones?
Located in sand/gravel quarry or bedrock?
Are pile slopes < 3:1 or <15% solids?
Does pad exceed permeability requirements?
Does pad show large ruts/erosion?
Does clean water flows through stockpile?
Does runoff flow from the stockpile to waters of state?
### C. Liquid Manure Storage Areas Operation & Maintenance

#### 1) Concrete Pit NA ✗

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Issues:</th>
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<tbody>
<tr>
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<td>If open-air, depth marker installed?</td>
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<td>Located under building?</td>
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<td>Freeboard/capacity shortage?</td>
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<td>Cracks in need of repair?</td>
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<td>Sloughing/flaking of concrete?</td>
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<td>Exposed rebar?</td>
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<td>Nonfunctional perimeter tile outlet (if constructed after 2000)?</td>
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<td>Barn constructed prior to 2000?</td>
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<td>Odorous/discolored liquid in perimeter tile (if monitoring port present)?</td>
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<td>Evidence of seepage from pit?</td>
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<td>Build up of manure near pumpouts?</td>
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<td>Pumpouts exposed (not covered)?</td>
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<td>Woody/deep rooted vegetation growing near pit walls?</td>
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<td>Low spots in berm?</td>
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<td>Evidence of seepage on exterior wall?</td>
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<td>Evidence of overflows?</td>
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<td>Liner torn or damaged?</td>
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<td>Odorous/discolored liquid in perimeter tile (if monitoring port present)?</td>
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<td></td>
<td></td>
<td>Woody/deep rooted vegetation growing on basin walls?</td>
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</tbody>
</table>

#### 2) Earthen Basin NA ✗

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Issues:</th>
</tr>
</thead>
<tbody>
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<td>If open-air, has depth marker installed?</td>
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<td>Is the basin covered?</td>
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<td>Is the cover maintained?</td>
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<td></td>
<td>Are they flaring captured gases?</td>
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<td>Is an anaerobic digester present?</td>
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<td></td>
<td>Freeboard/capacity shortage?</td>
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<td>Basin modified without approval?</td>
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<td>Low spots in berm?</td>
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<td>Evidence of overflows?</td>
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<td></td>
<td>Odorous/discolored liquid in perimeter tile (if monitoring port present)?</td>
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<td></td>
<td>Excessive gully erosion in basin walls?</td>
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<td>Anti-scour device around pipe outlet absent?</td>
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<td>Pumpout area maintenance problems?</td>
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<td>Woody/deep rooted vegetation growing on basin walls?</td>
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<td>Rodent burrows in berm?</td>
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<td>Evidence of seeping on exterior wall?</td>
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</tbody>
</table>

#### 3) Synthetic-lined Basin NA ☑

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<th>Issues:</th>
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<td>Is the structure covered?</td>
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<td>Is the cover maintained?</td>
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<td></td>
<td>Is the cover maintained?</td>
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<td>Are they flaring captured gases?</td>
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<td>Basin modified without approval?</td>
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<td>Low spots in berm?</td>
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<td>Liner torn or damaged?</td>
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<td></td>
<td>Odorous/discolored liquid in perimeter tile (if monitoring port present)?</td>
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<td></td>
<td>Evidence of seepage on exterior wall?</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Pumpout area maintenance problems?</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Woody/deep rooted vegetation growing on basin walls?</td>
</tr>
</tbody>
</table>

#### 4) Slurry Store or Above-ground Tank NA ☑

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Issues:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>If open-air, has depth marker installed?</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Is the structure covered?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Is the cover maintained?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Freeboard/capacity shortage?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Structure is leaking and/or overflowing?</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Evidence of past leak and/or overflow?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Transfer valve not properly maintained?</td>
</tr>
</tbody>
</table>
### 5) Manure Storage Area Emergency Response Plan

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Issues:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Has site plan showing release points to surface water (surface tile intakes, road ditches, etc.)?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Has plan of action for emergency spill response at facility and during transport to land application?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Trains employees?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compliant</th>
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<th>Non-compliant</th>
<th>Not Applicable</th>
<th>Issue(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Basin #4 has bubbled liner</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fencing required around basins 1-4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Depth Markers installed on basins 1-4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Return to Compliance by:</th>
<th>At the time of issuance of new individual NPDES/SDS permit</th>
</tr>
</thead>
</table>

### 6) Air Emission Notification for Exemption

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Is notification made for exemption during agitation and pumping for land application activities?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

### D. Other Production Area Features Operation & Maintenance

#### 1) Feed Storage Area

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Issues:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Piles of spoiled feed around storage bin?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Exposed feed or spillage on storage pad?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Clean water flows through feed area?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silage leachate can flow to waters?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Problems with leachate collection system?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compliant</th>
<th>Conditional Compliance</th>
<th>Non-compliant</th>
<th>Not Applicable</th>
<th>Issue(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Potential for leachate and feed pad contaminated run-off to reach the waterway located near the east edge of the feed pad.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Return to Compliance by:</th>
<th>At the time of issuance of new individual NPDES/SDS permit</th>
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</table>

#### 2) Milkhouse Wastewater

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Issues:</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Discharges to land surface?</td>
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<td></td>
<td></td>
<td></td>
<td>Discharging to surface water?</td>
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<tr>
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<td>Other:</td>
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</tbody>
</table>

#### 3) Permanent Stormwater Controls

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Issues:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td>Required permanent stormwater controls in place?</td>
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<td></td>
<td>Adequate permanent vegetation?</td>
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<td>Freeboard on control structure absent?</td>
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<td>Structure outlets eroding?</td>
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</tbody>
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<tr>
<th>Compliant</th>
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<th>Non-compliant</th>
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<th>Issue(s):</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td>Submit plans and specifications for addressing the silage leachate and feed pad run-off with the application packet for a new NPDES/SDS permit</td>
</tr>
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</table>

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<tr>
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</table>

### E. Carcass Disposal

#### 1) Rendering

<table>
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<tr>
<th></th>
<th>Yes</th>
<th>No</th>
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<th>Issues:</th>
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<td>Offsite pickup site accessible to scavengers?</td>
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<td></td>
<td>Carcasses present more than 72 hours non-refrigerated?</td>
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<td>Structure designed for this purpose?</td>
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#### 2) Incineration

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<tr>
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<th>Yes</th>
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<th>NA</th>
<th>Issues:</th>
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<td></td>
<td>Structure designed for this purpose?</td>
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<td>No afterburner?</td>
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<td></td>
<td>Structure designed for this purpose?</td>
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<tr>
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</thead>
</table>
3) Composting | NA ☑
---|---
Yes No NA Issues:
- ☑ Impervious pad not present?
- ☑ Exposed carcasses?
- ☑ Temperature not measured daily?
- ☑ Leachate not contained?

4) Burial | NA ☑
---|---
Yes No NA Issues:
- ☑ Carcasses not covered?
- ☑ Coarse-textured soils?
- ☑ Within 5 feet of water table?
- ☑ Within shoreland zone?

Return to Compliance by:

---

F. Non-Feedlot Operation & Maintenance

---

1) Well | NA ☑
---|---
Yes No NA Issues:
- ☑ Un-used wells are MDH sealed?
- ☑ Anti-backflow protection on waterline connections?
- ☑ DNR Water Appropriation Permit

2) On-site sewage system | NA ☑
---|---
Yes No NA Issues:
- ☑ Straight-piped to surface water? (Report)
- ☑ Discharging to ground surface? (Report)
- ☑ Toilet plumbed to manure storage area?

3) Burn Barrels | NA ☑
---|---
Yes No NA Issues:
- ☑ Solid waste burned on site?

4) Sharps Disposal | NA ☑
---|---
Yes No NA Issues:
- ☑ Stored in heavy-duty plastic container for later disposal?

5) Chemicals, Gas, and Oil Storage | NA ☑
---|---
Yes No NA Issues:
- ☑ Chemicals leaking onto ground?
- ☑ Pesticide containers accumulating?

---

G. Land Application of Manure

---

Facility Record-Keeping Review

---


did not perform record review at time of facility inspection. Mr. Daley was going to send application records to the MPCA in Rochester after 2009 spreading season was complete
### Facility Records Review

#### 1) O & M Records
- **Issues:**
  - Water lines checked daily?
  - Weekly stormwater diversion devices?
  - Weekly runoff diversion structures?
  - Weekly devices channeling runoff to containment area(s)?
  - Weekly of all LMSAs?
  - Weekly LMSA depth marker(s) readings?
  - Weekly examinations of LMSA drain tile line(s)?
  - Periodic inspections of land application equipment?

#### 2) Facility & Maintenance Records
- **Issues:**
  - Current design of all LMSAs?
  - LMSA maintenance?
  - Soil-lined poultry barn floor soil test results?
  - SWPPP maintenance & modification?
  - Improvements to runoff control & barns?
  - Activities that alter site or increase pollution potential?

#### 3) Short-term Stockpiling Records
- **Issues:**
  - Location information?
  - Date stockpile formed?
  - Volume of manure stored?

#### 4) Composting Records: Mortality or Manure
- **Issues:**
  - Quantities of materials delivered to site?
  - Temperature of compost?
  - Retention time of compost?
  - Analysis of finished compost?

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**Return to Compliance by:**
EXHIBIT 9
December 26, 2012

Mr. Ben Daley  
18942 County Road 18  
Lewiston, MN 55952

RE: October 23, 2012, Inspection  
Feedlot Registration Number 169-50002  
NPDES/SDS Permit Number MN0067652

Dear Mr. Daley:

Please find enclosed a Minnesota Feedlot NPDES/SDS Facility Inspection Checklist (Checklist) for Daley Farms of Lewiston LLP (Facility) located at 18942 County Road 18 Lewiston, Minnesota in Winona County. An inspection was conducted by the Minnesota Pollution Control Agency (MPCA) staff on October 23, 2012, others present at the inspection include Ben Daley (co-owner), and Mark Gernes Winona County feedlot officer. The inspection consisted of a Compliance and Land App II inspection. The purpose of the inspection was to evaluate the Facility for compliance with Minnesota feedlot rules and statutes.

The following is a summary of the MPCA staff’s findings and comments resulting from the inspection. Please refer to the enclosed Checklist for additional details regarding the inspection.

Areas of Concern or General Comments

1. The feed storage area, at the time of inspection, was incompliance with the National Pollutant Discharge Elimination System (NPDES) / State Disposal System (SDS) Permit.
2. At the time of the inspection, the confinement barns, liquid manure storage areas (LMSAs) and manure separating facilities were all being operated in compliance.
3. Install fence around LMSAs when the landscaping is complete.
4. Maintain records of water usage, daily water line checks, weekly tile monitoring checks, and diversion maintenance.
5. Submit an Annual report to the MPCA by March 1st, along with the records that are required on MPCA forms (MPCA manure management planner excel version).
6. Some fields inspected within the land application records contained application rates that were 20 percent higher than allowed by rule. This is due, in part, to the use of old manure management planning software that allowed higher rates. When planning and applying manure, make sure to be aware that for corn on corn the maximum Nitrogen rate from all sources is 180 pounds, 140 pounds of Nitrogen for corn following soybeans, and remember to take Nitrogen credits from alfalfa plow down first year credits 150 pounds and second year credits of 75 pounds.
December 26, 2012

If you have any questions regarding the inspection report, please contact me at 507-206-2618.

Sincerely,

Steven Schmidt
Pollution Control Specialist Senior
Rochester Office
Watershed Division

SS:cme

Enclosure

☒ Checklist ☐ Fact Sheet(s) ☐ LOW ☐ NOV ☐ Other

cc: Mark Gernes, Winona CFO (w/enclosure)
EXHIBIT 10
September 18, 2015

Mr. Ben Daley
17755 County Rd 18
Utica, MN 55979

RE: 9/10/2015 Feedlot Compliance Inspection
Daley Farm of Lewiston, LLP (West Farm); Feedlot Registration Number 169-82503

Dear Mr. Daley:

Thank you for the opportunity to meet with you on 9/10/2015 and to view your feedlot facility.

Please find enclosed a Minnesota Feedlot non-NPDES Permitted Facility Inspection Checklist for Daley Farm of Lewiston, LLP (West Farm) located at 23866 Cemetery Rd. The Checklist indicates areas of the feedlot that were checked for compliance with Winona County and State feedlot rules and statutes.

The following is a summary of the County staff’s findings and comments resulting from the inspection. Please refer to the enclosed Checklist for additional details regarding the inspection.

Areas of Concern or General Comments:
1. Milkhouse waste water discharging into ditch; historical pollution hazard. Upon issuance of Feedlot Permit, waste water will be handled through an irrigation system.
2. Manure nutrient analysis from manure storage area is from March 30, 2010 (older than 4 years). Minnesota Rule 7020.2225 Subp. 2.: “Manure from all manure storage areas storing manure produced from more than 100 animal units must be tested by the owner of the animal feedlot for nitrogen and phosphorus…Ongoing testing must continue at least once every four years unless more frequent testing is required.”

Required Corrective Actions:
1. By February 1, 2016, obtain a current manure nutrient analysis from an accredited lab and submit a copy of nutrient analysis to Winona County Feedlot Officer.

If you have any questions regarding the inspection report, please contact me at 507-457-6580.

Thank you, again, for your cooperation and coordination.

Sincerely,

Emily Bartusek
Winona County Feedlot Officer

Enclosures:
☒ Checklist
Minnesota Feedlot
(Non-NPDES) Inspection Checklist

NPDES/SDS Feedlot Program
National Pollutant Discharge Elimination System/
State Disposal System (NPDES/SDS)

Doc Type: Inspection (wq-f3-45e)
Key at the end of the checklist

Instructions: The MPCA or Delegated County staff should complete this form upon an inspection to evaluate non-NPDES permitted feedlots for compliance with Minnesota feedlot rules and statutes. A copy of the form will be returned to the feedlot owner following the inspection.

General Information
Name of facility: Daley Farm (West Farm) Date of inspection (mm/dd/yyyy): 9/10/2015
Registration No: 169-82503 Inspector Name: Emily Bartusek
Owner/Operator: Ben Daley (Mark, Brian & Shelly) Others Present:
Phone: 507-251-2444 Fax: E-mail:
Weather Conditions (at time of inspection): Foggy & semi-wet

Facility Location
County: Winona Twp: Utica Sect: 9 Qtr: SW
Facility address: 23866 Cemetery Rd City: Lewiston State: MN Zip Code: 55952 Parcel ID: 15.000.0780

Inspection Type (check all that apply):
☑ Facility Compliance ☐ Land Application Level II Records Review ☐ Land Application Level III Field Inspection

A. Feedlot History (Date format: mm/dd/yyyy)
Type of most recent inspection: Compliance Date of most recent inspection: 10/23/2012
Type of most recent enforcement action: n/a Date of enforcement action: n/a
Permit Type: n/a Issuance Date: n/a Expiration Date: n/a
Date of most recent registration: 10/23/2012

<table>
<thead>
<tr>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
</tr>
<tr>
<td>A.1 Does a MinnFarm or FLEval exist for the feedlot?</td>
</tr>
<tr>
<td>A.2 Is the feedlot located in a Drinking Water Supply Management Area?</td>
</tr>
<tr>
<td>A.3 Is the feedlot located in Shoreland?</td>
</tr>
<tr>
<td>A.4 Enrolled in the Open Lot Agreement?</td>
</tr>
</tbody>
</table>

B. Feedlot Components
Animal Types Registered or On-Site | Animal (head) Numbers | Notes: |
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Dairy – calf</td>
<td>Registered: 150 On-Site: 150</td>
<td>Registered for 170 AU</td>
</tr>
<tr>
<td>Dairy – heifer</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>
B. Feedlot Components (continued)

<table>
<thead>
<tr>
<th>Checklist Questions</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.1 Is Registration current (date within previous 4-year block)?</td>
<td>✓</td>
<td></td>
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<tr>
<td>B.2 Have animal units and animal species, types and numbers changed since the</td>
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<tr>
<td>most recent registration or inspection?</td>
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</tr>
<tr>
<td>B.3 Have animal holding areas or manure storage areas changed since the most</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>recent permit, Notice of Construction or Expansion, MinnFarm or inspection?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspection Requirement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.4 Construction or expansion requirements met.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Concentrated Animal Feeding Operation (CAFO) Identification

<table>
<thead>
<tr>
<th>Checklist Questions</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.1 Does the maximum capacity of this feedlot meet or exceed the CAFO threshold</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(# of head per species) or 1,000 animal units? (if yes the feedlots must seek</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPDES Permit Coverage)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.2 Does the owner own (all or part of) other feedlots adjacent to or within ¼</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mile of this feedlot?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.4 Is the owner required to seek NPDES/SDS permit coverage for this feedlot and</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>other commonly owned feedlots? (Refer to Minnesota Pollution Control Agency (MPCA))</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Open Lot Agreement (OLA)

2. Animal Confinement Barn(s)

<table>
<thead>
<tr>
<th>Checklist Questions</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Is any manure seepage from barns visible?</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Does upslope water drain through the barn(s)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Open Lot(s)

<table>
<thead>
<tr>
<th>Checklist Questions</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Do animals have access to a lake classified by the Minnesota Department of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Resources (DNR)? (7020.2015, subp. 2)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 Are clean-water diversions in place, operational and maintained?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3 Are runoff controls in place, operational, and maintained?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4 Is there evidence of runoff leaving the open lot(s) or runoff control(s)? (past</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>or present)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If Yes - Evaluate the following:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is runoff currently reaching surface waters?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4.1 Is there evidence runoff reached surface waters or tile intakes,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sinkholes, fractured bedrock, well, mine or quarry? (e.g. inadequate buffer, steep</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slope, channels, matted or dead vegetation, clean water run-on, stormwater flow)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4.2 Is there evidence runoff could impact ground water? (e.g., ponding, coarse-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>textured soils, depth to water table)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run off from open lot goes through pasture area that has been re-seeded to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>establish permanent vegetation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspection Requirement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.7 Open Lot discharge requirements met.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Feed Storage Area(s)

<table>
<thead>
<tr>
<th>Checklist Questions</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Are the soils beneath the storage area coarse-textured?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Feed is hauled over from main dairy on a daily basis. No feed storage on site.
4.2 Is there evidence of runoff leaving the feed storage area or feed storage area runoff controls? (past or present)  

4.5 Is more than 1,000 tons of sweet corn silage stored on site at any one time?

4.7 Feed Storage Area discharge requirements met.  
[7020.2003, subp. 1 & 3, 7050.0210, subp. 2 & 13, 7060.0600, subp. 2]

<table>
<thead>
<tr>
<th>Inspection Requirement</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>NC</td>
<td>NA</td>
<td>NI</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Milkhouse Waste Handling System(s)

5.1 Is milk-house wastewater contained in an approved structure or treated by an approved system?  

5.2 Is there evidence of milk-house wastewater leaving the control devices? (past or present)  

5.5 Milkhouse waste discharge requirements met.  
[7020.2003, subp. 1 & 3, 7050.0210, subp. 2 & 13, 7060.0600, subp. 2]

<table>
<thead>
<tr>
<th>Inspection Requirement</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>NC</td>
<td>NA</td>
<td>NI</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Short-term Manure Stockpile Site(s)

6.1 Are the required location prohibitions of 7020.2005 met? (shoreland, flood plain, sinkhole, and public wells)  

6.2 Are rock quarry(s), gravel or sand pit(s), bedrock, or any mining excavation site(s) used for the stockpile site?  

6.3 Is stockpile on an impervious pad?  

6.4 Does the stockpile stack have a slope of at least 3:1 or does the manure have at least 15% solids? (if no, manure cannot be stockpiled)  

6.5 Are upslope clean water diversions present if slopes are greater than 2%?  

6.6 Is runoff contained in an approved structure or treated by an approved system?  

6.7 Is there evidence of runoff leaving the site? (past or present)  

6.8 Permanent stockpile site technical requirements met.  
[7020.2125, subp. 1 & 4]

<table>
<thead>
<tr>
<th>Inspection Requirement</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>NC</td>
<td>NA</td>
<td>NI</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Permanent Manure Stockpile Site(s)

7.1 Are the required location prohibitions of 7020.2005 met? (shoreland, flood plain, sinkhole, and public wells)  

7.2 Are rock quarry(s), gravel or sand pit(s), bedrock, or any mining excavation site(s) used for the stockpile site?  

7.3 Is stockpile on an impervious pad?  

7.4 Does the stockpile stack have a slope of at least 3:1 or does the manure have at least 15% solids? (if no, manure cannot be stockpiled)  

7.5 Are upslope clean water diversions present if slopes are greater than 2%?  

7.6 Is runoff contained in an approved structure or treated by an approved system?  

7.7 Is there evidence of runoff leaving the site? (past or present)  

7.8 Permanent stockpile site technical requirements met.  
[7020.2125, subp. 1 & 4]

<table>
<thead>
<tr>
<th>Inspection Requirement</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>NC</td>
<td>NA</td>
<td>NI</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Manure Compost Site

8.1 Is there a dead box for rendering pick-up?  

9., 10., & 11. Liquid Manure Storage Area(s) (LMSA)

9.1 Is more than 1,000 gallons of liquid manure stored on site at any one time?  

10. Is there evidence of liquid manure leaving the control devices? (past or present)  

11. Liquid manure discharge requirements met.  
[7020.2003, subp. 1 & 3, 7050.0210, subp. 2 & 13, 7060.0600, subp. 2]

<table>
<thead>
<tr>
<th>Inspection Requirement</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>NC</td>
<td>NA</td>
<td>NI</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. Poultry Barn Floor(s)

13. Carcass Management

13.2 Type of Carcass Management (check all that apply) **single-click**

- [x] Render  - [ ] Compost  - [ ] Burial  - [ ] Incinerate

<table>
<thead>
<tr>
<th>Carcass Management Questions</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Render Checklist Questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.1 Is there a dead box for rendering pick-up?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Facility Name: Daley Farm (West Farm)  
Registration Number: 169-82503

13.2 Are carcasses picked up within 72 hours?  
Y ☑️ N NA NI  
Referral
Referred to Board of Animal Health

14. Level I Land Application of Manure Record Keeping for 100-299 AU (Non-CAFO)

<table>
<thead>
<tr>
<th>Checklist Questions</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1 Is a MMP available for the next crop year? (crop 1yr from now) MMP is not required unless applying for a permit</td>
<td>☑️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.2 Is there a manure analyses within the last 4 years? Not required if 100 AU or less contribute to manure storage List the manure analysis from manure storage area or stockpile with the two highest number of animal units: Livestock species: Dairy ☑️ ☑️ ☑️ ☑️ Solid Liquid</td>
<td>N</td>
<td>P</td>
<td>K</td>
<td>Yr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Livestock species:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.5 Are there records with these items? Field IDs and acres for each field Amounts of manure applied per acre for each field Method(s) of manure application</td>
<td>☑️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.6 Are records kept of application dates?</td>
<td>☑️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.8 Is manure incorporated within 24 hours near sensitive features? (may not be evident from records – may need to inquire)</td>
<td>☑️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.9 Are records kept of plant-available N per acre from manure and commercial fertilizers, including carry-over N? (P2O5 records also required if 100 or more AU and in DWSMA) List the highest rate of crop-available N applied: Amount N Applied</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N Crop: Corn ☑️ Previous Crop: Corn ☑️</td>
<td>22 lbs/acre</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>List the highest rate of crop-available P2O5 applied (if in DWSMA): Amount P2O5 Applied</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P2O5 Crop: Corn ☑️ Previous Crop: Corn ☑️</td>
<td>39.2 lbs/acre</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14.12 Land Application Recording keeping requirements met. [7020.2225, subp. 5]  
Y ☑️ N NA NI

15. Level II Land Application of Manure Inspection (Non-CAFO)  
Not inspected for this facility

16. Level III Land Application of Manure Inspection (Non-CAFO)  
Not inspected for this facility

17. Animal Feedlot and Manure Storage Area Closure  
Not Applicable to this Facility

18. Interim Permit  
Not Applicable to this Facility

19. Summary of Environmental Upgrades  
Not Applicable for this Inspection

End of Inspection.

Key

C = Compliance – At the time of the inspection, the feedlot and/or owner meet the requirements of applicable state rules and statutes or permit conditions.

NC = Non-Compliance – At the time of the inspection, the feedlot and/or owner do not meet the requirements of applicable state rules and statutes or permit conditions.

NA = Not Applicable – The condition is not present at this feedlot.

NI = Not Inspected – The condition was not inspected.

Y = Yes – Does not indicate compliance or non-compliance.

N = No – Does not indicate compliance or non-compliance.
| Checklist Question = Checklist questions are used by the inspector to evaluate feedlot conditions. |
| Inspection Requirement = Inspection requirements are statements that summarize the regulatory requirements of applicable state rules and statutes or permit conditions |
EXHIBIT 11
# Feedlot NPDES/SDS Permitted Facility Inspection Checklist

**NPDES/SDS Feedlot Program**  
National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS)

**Doc Type:** Inspection

## General Information

<table>
<thead>
<tr>
<th>Name of facility:</th>
<th>Daley Farms of Lewiston LLP 1</th>
<th>Date of inspection (mm/dd/yyyy):</th>
<th>9/6/2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility address:</td>
<td>18762 Highway 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City:</td>
<td>Lewiston</td>
<td>State:</td>
<td>MN</td>
</tr>
<tr>
<td>Zip code:</td>
<td>55952</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone:</td>
<td></td>
<td>Fax:</td>
<td></td>
</tr>
<tr>
<td>Owner/Operator:</td>
<td>Daley Farms of Lewiston LLP</td>
<td>Inspector Name:</td>
<td>Mark Gernes</td>
</tr>
<tr>
<td>Registration No:</td>
<td>169-115453</td>
<td>Qtr:</td>
<td>NE</td>
</tr>
<tr>
<td>Sect:</td>
<td>16</td>
<td>Twp:</td>
<td>Utica</td>
</tr>
<tr>
<td>County:</td>
<td>Winona</td>
<td>Parcel ID:</td>
<td></td>
</tr>
</tbody>
</table>

**Others present:** Emily Bartusek  
**Types of inspections (check all that apply):** Facility compliance, Land App II, Land App III

## A. Feedlot History (Date format: mm/dd/yyyy)

- **Date of most recent inspection:** 6/21/2013  
  **Type of most recent inspection:** Land App II
- **Date of most recent enforcement action:** 9/20/2004  
  **Type of enforcement action:** SOC
- **Permit Issuance Date:** 11/17/2010  
  **Permit Expiration Date:** 11/17/2015  
  **Permit Type:** Individual NPDES (Multi-site)
- **Date of most recent registration:** 11/17/2010

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1</td>
<td>Does a MinnFarm or FLEval exist for the feedlot?</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>A.2</td>
<td>Is the feedlot located in a Drinking Water Supply Management area?</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>A.3</td>
<td>Is the feedlot located in Shoreland?</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>A.4</td>
<td>Enrolled in the Open Lot Agreement?</td>
<td>☑</td>
<td>☐</td>
</tr>
</tbody>
</table>

## B. Feedlot Components

**Registered animal types and numbers:** 100 cows over 1,000 lbs = 140 AU  
**Actual animal types and numbers on site:** Same
### Checklist question:
Checklist questions are used by the inspector to evaluate compliance with the requirements of the permit and applicable state and federal rules and regulations.

### Inspection requirement:
Inspection requirements are statements that summarize the regulatory requirements of the permit and applicable state and federal rules and regulations for each major facility component for Permittees operating under the Minnesota National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Permit. Each section of the checklist evaluates a single component.

## Section II: Inspection

### B.1 Animal numbers are at or below permitted numbers?

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
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</thead>
</table>

### B.2 Animal species and types are the same as current permit?

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
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</thead>
</table>

### B.3 Other components, e.g. barns, lots, LMSAs, are the same as current permit?

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
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</table>

### B.4 Facility components match permitted components.

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
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</table>

### 1 Animal Confinement Barn Operation & Maintenance

#### Checklist questions:

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
</table>

#### Notes:

- **1.1** Are ventilation fans kept clean of built-up dust, feathers and other debris?  
- **1.2** Is any manure seepage from barns visible?  
- **1.3** Is the clean water diverted?  

#### Inspection requirement:

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
</table>

### 2 Open Lot Operation & Maintenance

#### Checklist questions:

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
</table>

#### Notes:

- **2.1** Are clean water diversions in place and operational?  
- **2.2** Is all manure-contaminated runoff contained?  
- **2.3** Is the transfer system between open lot and storage structure operating properly and well maintained?  
- **2.4** Is the runoff contained in approved structure or system?  

#### Inspection requirement:

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
</table>

#### Required Corrective Actions:

1. Corrective Actions for implementation of planned measures to address runoff from the open lot area will be included in the new Individual NPDES permit when it is issued.

### 3 Feed Storage Area(s) Operation & Maintenance

#### Inspection requirement:

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
</table>

### 4 Process Wastewater(s) Handling System Operation & Maintenance

#### Inspection requirement:

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
</table>
## Short-term Manure Stockpile Site Operation & Maintenance

Stockpile location checklist questions:

<table>
<thead>
<tr>
<th>Question</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Is the required 50 feet horizontal and 300 feet flow distance to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>surface water met?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5.2 If a well is nearby, is it greater than or equal to 100 feet away if</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the well is cased or 200 feet if it is not cased?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5.3 Is the stockpile located on slopes less than 6%?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.4 At the stockpile site are saturated soils greater than 2 feet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>below the surface?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5.5 At the stockpile site are at least some soils in top 5 feet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>verified sandy-loam or finer?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.6 Are rock quarry(s), gravel or sand pit(s), bedrock, or any</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mining excavation site(s) used for the stockpile site?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.7 Does the manure in the stockpile stack with slopes of at least 3:1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>or have at least 15% solids been confirmed?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.8 Is the volume of stockpiled manure less than 320 acres based on N?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.9 Are clean water diversions in place and operational?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.10 Is all manure removed from the site within 1 year?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.11 Is vegetation re-established for 1 growing season prior to site</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>re-use as a stockpile?</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Inspection requirements:**

<table>
<thead>
<tr>
<th>C</th>
<th>NC</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

5.12 Short-term stockpile location restrictions met.   ☒   ☐   ☐   ☒

5.13 Short-term stockpile site technical requirements met.   ☒   ☐   ☐   ☒

## Permanent Stockpile Site Operation & Maintenance

Checklist questions:

<table>
<thead>
<tr>
<th>Question</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
</table>

## Manure Composting Operation & Maintenance

Inspection requirements:

<table>
<thead>
<tr>
<th>C</th>
<th>NC</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

7.3 Manure composting requirements met.   ☒   ☐   ☐   ☒

7.4 Manure compost site (if within footprint of facility) meets zero discharge standard.   ☒   ☐   ☐   ☒

## Earthen Basin Liquid Manure Storage (LMSA) with or without Synthetic Lining Requirements

Inspection requirements:

<table>
<thead>
<tr>
<th>C</th>
<th>NC</th>
<th>NA</th>
<th>NI</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

8.14 Earthen LMSA O&M requirements met.   ☒   ☐   ☐   ☒

8.15 Earthen LMSA meets zero discharge standards.   ☒   ☐   ☐   ☒

## Concrete Liquid Manure Storage (LMSA) Requirements

Inspection requirements:

<table>
<thead>
<tr>
<th>C</th>
<th>NC</th>
<th>NA</th>
<th>NI</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

9.16 Concrete LMSA O&M requirements met.   ☒   ☐   ☐   ☒

9.17 Concrete LMSA meets zero discharge standards.   ☒   ☐   ☐   ☒

## Above-ground Liquid Manure Storage System (LMSA) Requirements

Inspection requirements:

<table>
<thead>
<tr>
<th>C</th>
<th>NC</th>
<th>NA</th>
<th>NI</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

10.8 Above-ground LMSA O&M requirements met.   ☒   ☐   ☐   ☒

10.9 Above-ground LMSA meets zero discharge standards.   ☒   ☐   ☐   ☒
### 11.1 Poultry barn floor maintenance requirements met.

#### 12 Carcass Management Requirements

<table>
<thead>
<tr>
<th>12.1 Checklist questions:</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1.1 Is the Facility following their submitted Animal Mortality Plan?</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 12.2 Rendering checklist items:

| 12.2.1 Is the carcass storage container animal-proof? | | | | | |
|-----------------------------------------------------|---|---|----|----|
| 12.2.2 Is the off-site carcass storage container at least 200' from the closest neighbor’s buildings? | | | | | |
| 12.2.3 Are carcasses picked up within 72 hours? | X | | | | |

#### 12.3 Composting checklist items:

<table>
<thead>
<tr>
<th>12.4 Burial checklist items:</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.5 Incineration checklist items:</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
<td>NI</td>
</tr>
</tbody>
</table>

#### 12.6 Method of carcass management meets BAH & MPCA technical requirements.

#### 12.7 Dead animal disposal or storage containment meets the zero discharge standard if it lies within the footprint of the facility.

### 13 Record-Keeping Requirements

| 13.1 Are the Level I manure application record-keeping requirements met? | | | | | |
| 13.2 Are the daily water line observation records kept? | X | | | | |
| 13.3 Are the weekly LMSA inspection records kept? | | | X | | |
| 13.4 In open-air systems, are the LMSA liquid level depth marker records kept? | | | | X | |
| 13.5 Where required, are the perimeter tile system observation records kept? | | | | X | |
| 13.6 Where required, are the storm water diversion structure observation records kept? | | | | X | |
| 13.7 Where required, are the records of runoff diversion observations kept? | | | | X | |
| 13.8 Where required, are the records of observation of devices channeling runoff kept? | | | | X | |
| 13.9 Where Permittee applies own manure, are records of manure application equipment inspection and maintenance kept? | X | | | | |
| 13.10 Are the records of actions taken to correct problems for items 13.2 through 13.9 kept? | X | | | | |
| 13.11 Are the record-keeping requirements of mortality disposal activities met? | X | | | | |
| 13.12 Are the record-keeping requirements of LMSA overflows met? | | | | X | |
| 13.13 Are the record-keeping requirements of stockpiling & manure composting activities met? | | | | X | |
| 13.14 Are the record-keeping requirements for poultry barn floor maintenance met? | | | | X | |

#### Inspection requirement:

#### 13.15 Record-keeping requirements met.

### 14 Level II Land Application Inspection
### MMP records and plans checklist questions:

<table>
<thead>
<tr>
<th>Question</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1 Is the MMP for next year available for review?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.2 Are the soil phosphorus test (SPT) results less than or equal to four years old?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.3 Is manure analysis obtained annually?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.4 Do the records kept for transferred-ownership manure meet requirements?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.5 Do the records kept for non-transferred-ownership manure meet requirements?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.6 Are records available for all manure applications?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.7 Is emergency winter application of manure conducted only at sites with MPCA pre-approval?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14.8 Is the total available N less than or equal to limits in 7020 rules?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14.9 Is summer manure application (June – August) followed with a planted cover-crop?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14.10 Is manure applied to sandy soils only after mid-October?</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Phosphorus management checklist questions:

<table>
<thead>
<tr>
<th>Question</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.11 In special protection areas or within 300 feet of open tile intakes on soils over 21 ppm Bray or 16 Olsen, is P applied during the rotation (6 years) less than P removed? See worksheet.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.12 In special protection areas or within 300 feet of open tile intakes is an approved P strategy followed for manure applied on soils greater than 75 ppm Bray or 60 Olsen?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.13 In special protection areas or within 300 feet of open tile intakes is manure incorporated within 24 hours?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.14 Approved P strategy is followed for manure applied on soils greater than 150 ppm Bray or 120 Olsen for land greater than 300 feet from sensitive features.</td>
<td></td>
<td></td>
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</tbody>
</table>

### Inspection requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>C</th>
<th>NC</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMP records &amp; plans meet requirements.</td>
<td></td>
<td></td>
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<tr>
<td>Nitrogen management meets requirements.</td>
<td></td>
<td></td>
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<tr>
<td>Phosphorus management meets requirements.</td>
<td></td>
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</tr>
</tbody>
</table>

### Level III Land Application Inspection

<table>
<thead>
<tr>
<th>Facility where manure originated</th>
<th>Same as site inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other (name):</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Land application technical requirements checklist questions:</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1 Is the method of application consistent with the approved MMP?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.2 Is the manure spread in a uniform pattern?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.3 Is manure prevented from entering waters, tile intakes, sinkholes and wells during the application process?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.4 Is a surface application occurring when chances of 1/2 inches or more of rain are less than 50% within the next 24 hours?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.5 Is a cover crop planted in fields after receiving manure application during summer months (June – August)?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15.6 Is the manure applied into the road right-of-way?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15.7 Manure application less than or equal to rates allowed by Minn. R. 7020.</td>
<td></td>
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</tbody>
</table>

### Non-Frozen soils setback requirements checklist questions:

<table>
<thead>
<tr>
<th>Question</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.8 Is the 25 foot setback from sensitive features followed?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15.9 Is the 50 foot setback from sinkholes and wells followed?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.10 Is the manure injected or incorporated within 24 hours on all land within 300 feet of sensitive features?</td>
<td></td>
<td></td>
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</tbody>
</table>

### Winter manure application requirements checklist questions:

<table>
<thead>
<tr>
<th>Question</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.11 Is the manure getting applied only to fields identified in the Permittee’s MMP?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15.12 Is solid manure being applied to slopes greater than 6%?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.13 Is liquid manure being applied to slopes greater than 2%?</td>
<td></td>
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</tbody>
</table>

**Notes:**
- Review of application records submitted as part of 2013, 2014 and 2015 annual reports noted:
  - record information that was included in annual reports was not actually records, but rather manure management plan information.
  - record information that was included in annual reports did not include any dates of application.
  - record information that was included in the 2013 & 2014 annual reports was manure management plan information for next crop year rather than for the crop year that was supposed to be provided as part of the annual report (i.e. a plan for the 2015 crop year was submitted for the 2014 annual report rather than 2014 records).

**Required Corrective Actions:**
1) For future records/annual reports (starting with record/annual report for the 2016 crop year), submit "record" information that corresponds to the correct year/reporting period for which the annual report is based on.

**Required Corrective Actions:**
1) For future records/annual reports (starting with record/annual report for the 2016 crop year), submit "record" information that corresponds to the correct year/reporting period for which the annual report is based on.
15.14 Is manure application occurring during times of high snowmelt potential?

15.15 Is the application meeting the 300 foot setback to sensitive feature(s)?

<table>
<thead>
<tr>
<th>Inspection requirements:</th>
<th>C</th>
<th>NC</th>
<th>NA</th>
<th>NI</th>
</tr>
</thead>
</table>

15.16 Land application technical requirements met.

15.17 Non-frozen Soils setback requirements met.

15.18 Winter application requirements met.

---

16 Additional individual permit requirements:

<table>
<thead>
<tr>
<th>Checklist questions:</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
<th>NI</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.1 If site is operating under an individual permit, all additional permit conditions are met?</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>

---

19 Other and emerging issues (Do not track in Delta)

19.1 Any additional county requirements?

19.2 Agitation and Pumpout Notification for Exemption

19.3 Have they identified potential release points to surface water at the site and along transportation route for manure application?

19.4 Do employees receive regular training on emergency procedures?

19.5 Secondary carcass management plan available?

19.6 Program updates

---

20 Printed materials distribution (Do not track in Delta)

<table>
<thead>
<tr>
<th>Requested</th>
<th>Delivered</th>
<th>Mailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.1 Copy of Minn. R. 7020</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.2 ‘Applying Manure in Sensitive Areas’ booklet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.3 Transferred manure Record-keeping pad</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.4 Record-keeping form for greater than 300 AU</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.5 Field Records Booklet (MES)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.6 Manure Application Rate Guide</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.7 Carcass Disposal Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.8 Catastrophic Loss Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.9 LMSA Maintenance Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.10 LMSA Closure Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.11 Silage Management Factsheet</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>20.12 Well setback MDH Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.13 ISTS/SSTS Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.14 Burn Barrel Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.15 Solid/Hazardous Waste Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.16 Truck Wash Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.17 Stormwater Control Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.18 Sharps Disposal Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.19 Water Appropriation Permit Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.20 “Pasture vs Feedlot”</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.21 Winter Grazing Factsheet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>20.22 Other</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Minnesota Center For Environmental Advocacy ("MCEA")

Comments and Petition for a Contested Case Hearing

on

The Draft National Pollutant Discharge Elimination System ("NPDES") Permit

for the expansion proposed at the

Daley Farms of Lewiston, LLC operation in Winona County

November 15, 2018

SUMMARY

The Minnesota Pollution Control Agency ("MPCA") proposes to issue an National Pollutant Discharge Elimination System/State Disposal System permit ("NPDES permit") authorizing a significant expansion of the Daley Farms of Lewiston LLC dairy operation in Winona County ("Daley Expansion"). Based on the existing record, MPCA cannot issue this permit because the project has not identified enough competent land that could receive the volumes of manure that will be produced by the expanded facility. The land that has been identified for application is pocked with karst features that will convey manure directly to ground and surface waters. As a result, MPCA cannot conclude that the project as proposed will comply with the requirements of the Clean Water Act and state law. The project as proposed would instead further endanger public health in an area that is already experiencing health impacts from contaminated drinking water. Petitioners therefore request that the MPCA deny the NPDES permit for the Daley Expansion. If the agency does not deny the application, Petitioners request
that the agency refer the disputed issues of material fact to the Office of Administrative Hearings for resolution in a contested case hearing.

I. TIMELINESS

This comment and request for a contested case hearing is timely. MPCA published the Public Notice of the intent to issue an NPDES permit for the Daley Expansion on October 1, 2018, and extended the comment period until November 15, 2018 at the request of Petitioners and others, due to the fact that this comment period coincided with harvesting, and because of the complexity of the project. The petition for a contested case is timely pursuant to Minn. R. 7000.1800, which provides that a petition for a contested case hearing “must be submitted during the public comment period established under parts 7001.0100.”

II. STATEMENT OF INTEREST

MCEA is a Minnesota nonprofit public interest organization with over 3,000 members including many in Winona County. MCEA’s mission is to use law, science, and research to protect and enhance Minnesota’s natural resources, wildlife, and the health of its people. MCEA has advocated for sustainable agriculture for many years, and was integrally involved in the feedlot rule amendments implemented in the early 2000s.

III. APPLICABLE LEGAL STANDARDS

Before issuing an NPDES Permit, MPCA must make the following finding:

Except as provided in subpart 2, the agency shall issue, reissue, revoke and reissue, or modify a permit if the agency determines that the proposed permittee or permittees will, with respect to the facility or activity to be permitted, comply or will undertake a schedule of compliance to achieve compliance with all applicable state and federal pollution control statutes and rules administered by the agency, and conditions of the permit and that all applicable requirements of
Similarly, the MPCA can refuse to issue the Permit if it finds:

A. that with respect to the facility or activity to be permitted, the proposed permittee or permittees will not comply with all applicable state and federal pollution control statutes and rules administered by the agency, or conditions of the permit;

C. that the permittee has failed to disclose fully all facts relevant to the facility or activity to be permitted, or that the permittee has submitted false or misleading information to the agency or to the commissioner;

D. that the permitted facility or activity endangers human health or the environment and that the danger cannot be removed by a modification of the conditions of the permit;

In issuing an NPDES/SDS permit, MPCA must ensure that the permit contains “conditions necessary for the permittee to achieve compliance with all Minnesota or federal statutes or rules.” The Commissioner is required to establish “effluent limitations, standards, or prohibitions for each pollutant to be discharged from each outfall or discharge point of the permitted facility.”

Below, Petitioners set forth the detailed reasons why the Permit does not meet the standards set forth above.

IV. THE DRAFT PERMIT DOES NOT MEET THE REQUIREMENTS OF THE CLEAN WATER ACT AND STATE LAW

A. Clean Water Act

The Clean Water Act prohibits the discharge of pollutants to waters of the United States without a NPDES permit. In Minnesota, MPCA administers the NPDES permit program by

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1 Minn. R. 7001.0140, subp. 1. In separate comments, MCEA also asserts that, under the conditions in Minn. R. 4410.1700, MPCA should order an EIS.
2 Id., subp. 2.
3 Minn. R. 7001.1080, subp. 1.
4 Id., subp. 2.
5 33 U.S.C. §§ 1311(a), 1342(a).
issuing permits that comply with or are more stringent than federal permit requirements, to persons seeking to discharge pollutants into waters within Minnesota. The CWA requires that all NPDES permits for point sources contain technology based effluent limits and any more stringent limits necessary to meet water quality standards. The limits necessary to meet water quality standards – commonly referred to as water quality based effluent limits or WQBELs – must control all pollutants that “are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an in-stream excursion above any State water quality standard.” MPCA must ensure that “the level of water quality to be achieved by limits on point sources … is derived from and complies with all applicable water quality standards.” In other words, MPCA must limit point source discharges as “necessary to keep the concentration of a pollutant in a waterway at or below the numeric benchmark.”

New sources and new dischargers, such as the Daley Expansion, are subject to more stringent controls, particularly where the new source or new discharger will contribute pollutants to an already impaired water. No permit may be issued to a new source or new discharger if a

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6 Minn. Stat. § 115.03; 40 C.F.R. § 123.25(a); 33 U.S.C. § 1342.
8 40 C.F.R. 122.44(d)(1)(i).
9 The Clean Water Act made it the national goal to eliminate all discharges of pollutants to waters by 1985, with an interim goal that water quality supports both fish and aquatic life and all recreational uses by July 1, 1983. 33 U.S.C. § 1251(a). Under the Clean Water Act, each state is charged with establishing the water quality goals and uses of waters within its borders. See 40 C.F.R. § 131.4(a). These so called “water quality standards” establish both the uses of waterways—such as for fishing or recreation—and the maximum allowable concentration of pollutants that may be present in a waterbody to ensure the designated uses will be met. See 40 C.F.R. § 131.5 (establishing the criteria for EPA approval of water quality standards, one of which being that the standards “protect the designated water uses”).
10 40 C.F.R. § 122.44(d)(vii)(A).
11 In re Alexandria Lake Area Sanitary Dist. NPDES/SDS Permit No. MN0040738, 763 N.W.2d 303, 309 (Minn. 2009) (quoting Am. Paper Inst., Inc. v. EPA, 996 F.2d 346, 350 (D.C. Cir. 1993)).
12 40 C.F.R. 122.29(a).
discharge from construction or operation will cause or contribute to a violation of water quality standards.\textsuperscript{13} However, a new source or new discharge may be permitted in situations where a pollutant load allocation has been performed and the permittee has demonstrated, before the close of the public comment period, that there are sufficient remaining pollutant load allocations to allow for the discharge (and the existing discharges are subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards).\textsuperscript{14}

B. **Effluent Limits For CAFOs**

A Concentrated Animal Feeding Operation ("CAFO"), like all other NPDES permitted facilities, is subject to both technology based effluent limits and more stringent water quality based effluent limits needed to meet water quality standards for the types of pollutants discharged from the facility. The NPDES requirements for CAFOs apply with respect to all animals in confinement at the operation and all manure, litter, and process wastewater generated by those animals or the production of those animals.\textsuperscript{15} Land application discharges from a CAFO are also subject to NPDES requirements.\textsuperscript{16}

As a large CAFO subject to NPDES permitting requirements, the Daley Expansion must comply with federal technology based effluent limits, including Best Management Practices that include, among other things:

- A nutrient management plan ("NMP")\textsuperscript{17} “based on a field-specific assessment of the potential for nitrogen and phosphorus transport from the field and that addresses the form, source, amount, timing, and method of application of nutrients on each field to achieve realistic production goals, while minimizing nitrogen and phosphorus movement to surface waters;”

\textsuperscript{13} 40 C.F.R. § 122.4(i).
\textsuperscript{14} Id.
\textsuperscript{15} 40 C.F.R. § 122.23(a).
\textsuperscript{16} 40 C.F.R. § 122.23(e); Minn. R. ch. 7020.
\textsuperscript{17} The document known as a “nutrient management plan” under the federal rules is referred to as a “manure management plan” under state rules. Minn. R. 7020.2225, subp. 4.
• Application rates that minimize phosphorus and nitrogen transport from the field to surface waters in compliance with the technical standards for nutrient management;

• Manure and soil sampling;

• A prohibition on applying manure closer than 100 feet of surface waters, open tile line intakes, sinkholes, agricultural well heads, or other conduits to surface waters or a 35-foot vegetated buffer that receives no manure.\(^{18}\)

A nutrient management plan that meets the standards established in federal law is a mandatory prerequisite for a CAFO seeking coverage under an NPDES permit.\(^{19}\) Specifically, the NMP must:

“(vi) Identify appropriate site specific conservation practices to be implemented, including as appropriate buffers or equivalent practices, to control runoff of pollutants to waters of the United States;

. . .

(viii) Establish protocols to land apply manure, litter or process wastewater in accordance with site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrient in the manure, litter or process wastewater.”\(^{20}\)

It is of the utmost importance that either the NMP definitively prevents any pollutants from reaching surface waters at levels that contribute to a violation of water quality standards or that the NPDES permit contains additional conditions that do so. This is because federal law exempts from NPDES permit requirements any agricultural stormwater discharges that occur despite application of manure in accordance with an NMP.\(^{21,22}\) However, the agricultural stormwater exemption does not exempt all discharges from land application areas: precipitation related discharges are exempted agricultural stormwater discharges only where “the CAFO has applied the manure in accordance with nutrient management practices that ensure ‘appropriate

\(^{18}\) 40 C.F.R. § 412.4(c)1.

\(^{19}\) 40 C.F.R. § 122.42(e)1.

\(^{20}\) Id. See also Minn. R. 7020.2225.

\(^{21}\) 33 U.S.C. § 1362(14); 40 C.F.R. § 122.23(e).

\(^{22}\) This same exemption does not exist in state law, see Minn. R. 7001.1030.
agricultural utilization’ of the manure, litter, or process wastewater nutrients.” 23 “[W]hile the statute does include an exception for ‘agricultural stormwater discharges’ there can be no escape from liability for agricultural pollution simply because it occurs on rainy days.” 24 Minnesota State rules simply prohibit the application of manure and process wastewater in a manner that will “result in a discharge to waters of the state during the application process” or “cause pollution of waters of the state due to manure-contaminated runoff.” 25

By themselves, NMPs are not sufficient to ensure public health, nor are they intended to, and therefore water quality based effluent limits may be necessary to protect the public health. 26 Water quality based effluent limits may also be necessary, in addition to the NMP, to prevent a facility from contributing to a violation of water quality standards. 27 In particular, water quality effluent limits may be needed to meet water quality standards for nitrate or pathogens, such as E. coli and fecal coliform, channeled to surface water overland or via other conduits such as sinkholes, fissures, fractured bedrock, or drain tile. 28 For example, compliance with EPA’s technology based limits will not eliminate the discharge of pathogens from land spreading activities, although the limit could reduce pathogens by about 46% from baseline levels. 29 And the manure application setback requirements in Minn. R. ch. 7020 are based on research related

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24 Concerned Area Residents for Env’t v. Southview Farms, 34 F.3d 114, 120 (2nd Cir. 1994).
25 Minn. R. 7020.2225.
26 Waterkeeper All., Inc. v. U.S. E.P.A., 399 F.3d 486, 519 (2nd Cir. 2005).
27 74 Fed. Reg. at 70458.
29 73 Fed. Reg. 70,418-01; see also Chapter 12 of “Development Document for the Final Revisions to the NPDES and the Effluent Guidelines for CAFOs” EPA-821-R-03-001. See also 68 Fed. Reg. 7176, 7197-98 (the primary role of applying at agricultural rates is to control the runoff of nutrients, not the discharge of pathogens.)
to phosphorus transport, not bacterial transport, and the effectiveness of these current setbacks on bacterial transport to surface waters is not known.30

In addition, discharges that reach surface water via overland runoff, sinkholes, fractured bedrock, fissures, drain tile, and other conduits can be discharges from a point source regardless of whether they are found on land application areas controlled by the facility or found on land application areas for transferred manure. Under federal law, the “collection of liquid manure into tankers and their discharge on fields from which the manure directly flows into navigable waters are point source discharges. . .”31 Under state law, sinkholes, discrete fissures, drain tile, and other conduits are by definition point sources that must be permitted irrespective of whether it is agricultural stormwater or another source of pollutants that flows through these conduits and fissures.32,33 Therefore, conditions sufficient to prevent these point source discharges of pollution from contributing to a violation of water quality standards are required by law.34

30 Mississippi River – Winona Watershed Pollutant Reduction Project (Total Maximum Daily Load Study) for Nutrients, Sediment and Bacteria at 51-52.
31 Concerned Area Residents for Env’t v. Southview Farm, 34 F.3d 114, 119 (2nd Cir. 1994).
32 According to state law, point sources are “any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.” Minn. Stat. § 115.01, subd. 11. A "Drainage system" is a “system of ditch or tile, or both, to drain property, including laterals, improvements, and improvements of outlets, established and constructed by a drainage authority.” Minn. Stat. § 103E.005, subd. 12. A “sinkhole” is a “surface depression caused by a collapse of soil or overlying formation above fractured or cavernous bedrock. Minn. R. 7020.0300, subp. 22.
33 State law, which may be more stringent than the federal Clean Water Act, does not contain the agricultural stormwater exemption. Minn. R. 7001.0130. “Because the exemption is not incorporated by reference in state-administered NPDES programs, which may be more stringent than the EPA regulations, and because Minnesota’s NPDES program does not have its own [exemption], the federal [exemption] does not apply in Minnesota.” West McDonald Lake Association v. Minnesota Department of Natural Resources, 899 N.W.2d 832, 842-843 (Minn. Ct. App. 2017); see also, 40 C.F.R. § 123.25; Minn. Stat. § 115.03, subd. 5.
C. MPCA Has A Duty To Regulate Agricultural Nonpoint Sources Of Pollution

The federal Clean Water Act creates the primary authority for permitting point source discharges of pollution, but the Act places primary responsibility for the control of nonpoint sources on states, such as Minnesota. Specifically MPCA has the authority and duty to control nonpoint sources of pollution, including those nonpoint sources from agricultural operations:

The agency is hereby given and charged with the following powers and duties:

. . .

(e) to adopt, issue, reissue, modify, deny, or revoke, enter into or enforce reasonable orders, permits, variances, standards, rules, schedules of compliance, and stipulation agreements, under such conditions as it may prescribe, in order to prevent, control or abate water pollution, or for the installation or operation of disposal systems or parts thereof, or for other equipment and facilities:

(1) requiring the discontinuance of the discharge of sewage, industrial waste or other wastes into any waters of the state resulting in pollution in excess of the applicable pollution standard established under this chapter…

The statute explicitly includes agricultural sources in its definition of “other waste”:

"Other wastes" mean garbage, municipal refuse, decayed wood, sawdust, shavings, bark, lime, sand, ashes, offal, oil, tar, chemicals, dredged spoil, solid waste, incinerator residue, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, cellar dirt or municipal or agricultural waste, and all other substances not included within the definitions of sewage and industrial waste set forth in this chapter which may pollute or tend to pollute the waters of the state.

The Legislature plainly provided the MPCA with both the authority and the duty to regulate agricultural sources of pollution to the state’s waters.

36 Minn. Stat. § 115.03, subd. 1 (emphasis added).
37 Minn. Stat. § 115.01, subd. 9 (emphasis added).
D. The Area Where Daley Farms Proposed To Land Apply Liquid Manure Is Highly Susceptible To Pollution Due To Karst Features And Sinkholes.

The record in this matter demonstrates that the sites where Daley Farms intends to apply the liquid manure generated from its proposed expansion are replete with karst features, including sinkholes and disappearing streams and the like. Moreover, these areas are likely to develop additional sinkholes.\footnote{See \url{https://conservancy.umn.edu/bitstream/handle/11299/58435/winona_plt5_sinkholes%5b1%5d.pdf?sequence=5&isAllowed=y}} Groundwater under such areas is susceptible to pollution.\footnote{See \url{https://conservancy.umn.edu/bitstream/handle/11299/58435/winona_plt6_gwsuscept%5b1%5d.pdf?sequence=4&isAllowed=y}}


The terms of the draft permit are insufficient to prevent pollutants contained in land-applied liquid manure originating from the Daley Expansion from contaminating surface waters. The draft permit prohibits “the discharge of manure and manure contaminated runoff from a land application area, except where the discharge is an agricultural storm water discharge.”\footnote{Draft Permit at 44, Section 13.3.} The agricultural stormwater exemption is broad, and includes any precipitation-related discharges of manure from land areas under the CAFO’s control if the manure has been applied in accordance with an MMP that ensures appropriate agricultural utilization of the nutrients in the manure.\footnote{\textit{Id.} at 43.} Thus, by allowing an “agricultural storm water discharge,” the draft permit is not sufficient to protect water quality because it is not designed to prevent discharges of nitrate, phosphorus and \textit{E. coli} from reaching surface waters.

The draft permit fails to ensure that the discharging facility is not generating pollution that will cause or contribute to a violation of water quality standards in two ways. First, the

\footnote{Draft Permit at 44, Section 13.3.}
permit restrictions do not appear to prevent the discharge of pollutants from land spreading of manure that occurs on land that is outside the facility’s control. MPCA has the duty to ensure these pollutants are not causing exceedances of water quality standards in surface waters, or contributing pollutants such as nitrates and bacteria in excess of a load allocation in a TMDL. Although rules apply to transferred manure, the MPCA does not directly inspect or regulate these applications. This is important considering that Daley Expansion will cause an estimated 19 million gallons of manure to be spread on land outside its control.

Second, the permit will not prevent discharges of pollution that occur even when the facility is applying manure according to its manure management plan. The agronomic rates utilized in the facility’s manure management plan are not intended to prevent the addition of nutrients to surface water or groundwater. These rates are calculated based on economics, and vary depending on the ratio of nitrogen costs to corn prices. These rates of application will result in subsurface discharges of nitrogen at levels higher than the health risk limit for nitrogen.

In addition, there has been no analysis of whether the landspreading of manure will contribute bacteria to waters of the United States which are already significantly contaminated by excess bacteria in the area where Daley Farms operates and where its manure will be applied. Compliance with EPA’s technology based limits will not eliminate the discharge of pathogens from manure application activities, although in some circumstances those limits could reduce pathogens by 46% from baseline levels. There has been no analysis of whether this reduction

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42 Minn. R. 7020.2225, subp. 1, item D.
43 Daley Farms Lewiston, LLC, NPDES Permit Application Materials, at 1061 of 1090.
44 Report of Dr. Gyles Randall’s Review of Portions of the Daley LLP Proposed Dairy Expansion, attached as Exhibit (Ex”) 1; Best Management Practices for Nitrogen Use in Southeastern Minnesota, University of Minnesota Extension, at Table 2.
45 73 Fed. Reg. 70,418-01; see also Chapter 12 of “Development Document for the Final Revisions to the NPDES and the Effluent Guidelines for CAFOs” EPA-821-R-03-001; see also,
can be expected in areas where karst topography and sinkholes are ubiquitous. Additionally, the manure application setback requirements in Minn. R. ch. 7020 are based on research related to phosphorus transport, and not bacterial transport, and the effectiveness of these current setbacks on bacterial transport to surface waters is not known.46

The MMP, as drafted, clearly fails to control pollutants from reaching ground and surface water at land application sites. The application of manure from the Daley Expansion is likely to result in contamination of surface water given the karst geology of fissures, sinkholes, fractured bedrock and other conduits in the region where the facility is located and intends to land apply manure. This pollution will either happen directly on Daley Farms land, or after the manure is transferred to other individuals in the community.

These anticipated discharges will reach surface water either via overland runoff or via hydrologically connected groundwater and will contribute to a violation of water quality standards. The draft NPDES permit for Daley Farms does nothing to prevent this violation of the Clean Water Act and state law.

F. The Land Application Practices Allowed Under The Permit Will Result In Subsurface Discharges Of Manure To Groundwater

The Draft Permit Section 13.4 states:

The Permittee shall not discharge from the facility, by overflow or other means, manure, manure-contaminated runoff, or process wastewater to a sinkhole, fractured bedrock, well, surface tile intake, mine, quarry, or other natural or constructed channels that convey fluids to groundwater.

68 Fed. Reg. 7176, 7197-98 (the primary role of applying at agricultural rates is to control the runoff of nutrients, not the discharge of pathogens.)

46 Mississippi River – Winona Watershed Pollutant Reduction Project (Total Maximum Daily Load Study) for Nutrients, Sediment and Bacteria at 51-52.
The “leaky” nature of the karst topography underlying Daley Farms and surrounding areas, coupled with information provided in Dr. Randall’s attached report, demonstrates that MPCA does not have a factual basis for concluding that the Daley Expansion could comply with this prohibition. In this area—where current agricultural practices are already causing significant groundwater contamination—it is beyond reason to conclude that that spreading many million gallons more of liquid manure will not intensify the problem. MPCA has not shown that the additional liquid manure will not increase nitrogen or *E. coli* in the groundwater.

In addition, there has been no analysis of whether the landspreading of liquid manure will contribute bacteria to waters of the state, including groundwater that is the source of drinking water for a significant number of individuals and families living in Winona County.

There are numerous pathways for land-applied liquid manure to reach ground and surface waters in this region via fissures, conduits, fractured bedrock, and sinkholes. In addition, Dr. Randall’s report identifies other additional pathways for subsurface discharges. Over-applying nutrients in excess of agricultural utilization to incompatible sites (very high STP levels, sloping soils, shallow soils, numerous setbacks) will lead to significant environmental concerns. Specifically, the Daley Expansion will “result in excess levels of nitrate available for leaching to ground water,” with a risk of “significant and unacceptable surface water contamination (sediment, manure, and pathogens) or ground water pollution.”

Because the project cannot comply with the effluent limitations on subsurface discharges, the project is ineligible for permit coverage.

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G. The Permit Will Allow Application Of Manure At Rates That Exceed Agricultural Utilization Of Nutrients

It is a certainty that the project as proposed will apply liquid manure to croplands in excess of agricultural utilization of nutrients, for two primary reasons. First, the proposal uses clearly erroneous maximum nitrogen application rates to estimate the acres needed. Second, many of the acres the MMP identifies for landspreading manure are unsuitable for land application due to setbacks, soil depth, and soil characteristics that render the land ineligible for land application. Uniform pattern application of liquid manure will be very difficult on many of the manure application sites identified in the MMP. In other words, the project does not have enough acres to apply the 46 million gallons of manure it will generate, and even less of the application acreage will be available for manure spreading than the proposal assumes. Dr. Randall in fact seriously questions “whether there are enough acceptable soils in this proposal to receive the manure produced from this dairy expansion project without significant and unacceptable surface water contamination (sediment, manure, and pathogen) or groundwater pollution (nitrate-nitrogen).” As a result, the project will apply far more manure than can be utilized by crops, causing contamination of ground and surface waters; violating 40 C.F.R. § 412.4(c), 40 C.F.R. § 122.42(e) and Minn. R. 7020.2225, subp. 3; and rendering the project ineligible for coverage under the permit for the following reasons:

- The project’s MMP states that manure will be applied on land under Daley Farm’s control at rates ranging from 3,000 to 20,000 gallons/acre. The MMP estimates the nutrient content of the liquid manure at either 13.18, or 31 lbs. nitrogen per 1,000 gallons, but Dr. Randall questions how the nutrient in previous year’s manure of 13 lbs. per gallon can be 58% lower than the Book value of 31 lbs. per 1000 gallons.

- As Dr. Randall explains, the recommended N rate used in the Daley Farms EAW is based on outdated recommendations of 180 lbs. N/acre for corn after corn and 140

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48 Id.
49 Daley Farms of Lewiston, LLC Nutrient Application Planning Worksheet.
50 Daley Farms of Lewiston, LLC Crop and Nutrient Planning Worksheet.
lbs. N per acre for corn following soybean. This is an excessive amount of nitrogen application, and far more than can be utilized by crops. Dr. Randall explains in his attached report that the Maximum Return to Nitrogen ("MRTN") rate is much lower: 123 lbs. nitrogen per acre for corn after soybeans and 159 lbs. per acre for corn after corn.\(^{51}\) Even then, we know that MRTN is not intended to protect groundwater, is based on the maximum economic return to the farmer, and will result in nitrate levels in groundwater above the health risk limit.\(^{52}\)

- The proposal would also apply phosphorus at rates excessive to agricultural needs. Dr. Randall concludes that manure applications on fields with very high soil test phosphorus, as Daley Farm’s proposes, are a “significant environmental concern to surface waters.”\(^{53}\) And scenario #1 in the 6-year soil phosphorus management plan would result in excessive nitrate.\(^{54}\)

- There are many characteristics of a crop field that render it ineligible for land application of manure, due to sloping soils, shallow soils, and numerous setbacks. As Dr. Randall observes, 10 identified manure application sites are identified as “poor” based on in-field characteristics including dominant soil types, slopes, topography, shallow soils to bedrock, Karst features, setbacks and water courses.

- Some of the soils at the application sites have slopes of 7-20% “that are more conducive to soil erosion, especially in the knifed-in manure strips that lead up and down the hill slopes.”\(^{55}\) At those sites significant erosion can occur “leading to pollution of surface waters.\(^{56}\) In addition, the shallow soils found at many application sites “limit crop yields and enhance nitrate loss to groundwater.”

Dr. Randall ultimately concluded, “[b]etween site characteristics of the designated MAS including very high STP levels, sloping soils, shallow soils, numerous setbacks, and the improper N recommendations being used in the EAW, I am very concerned about the success of the proposed dairy expansion project. The large amount of manure being produced appears to require more ‘manure friendly’ land area than has been designated in the 42/44 MAS, unless

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\(^{52}\) Dr. Gyles Randall, *Nitrogen BMP’s for Corn in Minnesota*, attached as Exhibit 2.

\(^{53}\) *Id.*

\(^{54}\) *Id.*

\(^{55}\) *Id.*

\(^{56}\) *Id.*
manure is applied to the strongly sloping and shallow soils, which will lead to significant environmental concerns.”57

H. The Permit Lacks Conditions Sufficient To Meet Water Quality Standards.

The Daley permit does not contain conditions sufficient to prevent pollution of groundwater and surface water. Federal law requires MPCA to impose effluent limitations necessary to protect the receiving water and achieve water quality standards.58 No permit may be issued by the MPCA “[w]hen the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States.”59 Further regulations stipulate that:

. . . each NPDES permit shall include conditions meeting the following requirements when applicable.

. . . (d) Water quality standards and State requirements: any requirements in addition to or more stringent than promulgated effluent limitations guidelines or standards under sections 301, 304, 306, 307, 318 and 405 of CWA necessary to:

(1) Achieve water quality standards established under section 303 of the CWA, including state narrative criteria for water quality.

   (i) Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.60

Water quality based effluent limits (“WQBELs”) “shall ensure that… [t]he level of water quality to be achieved by limits on point sources … is derived from, and complies with all applicable water quality standards.”61

The threshold for inclusion of water quality based effluent limits is low: limits are necessary when a pollutant “may be discharged at a level which will cause, have a reasonable

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57 Id.
59 40 C.F.R. § 122.4(d).
60 40 C.F.R. § 122.44.
potential to cause, or contribute to an excursion above State water quality criteria regardless of whether the water is listed on a state’s 303(d) impaired waters list.\textsuperscript{62} Even if a water body is not currently impaired, a permit writer must include a WQBEL if a discharge has the reasonable potential to cause or contribute to an excursion of applicable standards.\textsuperscript{63}

As explained more fully above, and in the attached expert reports of Dr. Randall, land spreading of manure from the facility will cause or contribute to violation of surface water quality standards in the already severely polluted area streams. The conditions in the Daley permit neither meet the standards of the Clean Water Act and state law, nor are they capable of preventing pollution from the facility from entering surface and groundwater.


Rivers and streams with levels of nitrate and \textit{E. coli} (or fecal coliform) pollution that exceed Minnesota’s established water quality standards are unsafe for fishing or swimming, and MPCA may not authorize activities that increase pollution to these waters.

The Clean Water Act prohibits the Daley Expansion from discharging \textit{E. coli} and nitrate to impaired streams in the watershed unless, or until, a concrete plan is being implemented to bring the waters into compliance with water quality standards. The Clean Water Act prevents issuance of a NPDES permit:

(i) To a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards. The owner or operator of a new source or new discharger proposing to discharge into a water segment which does not meet applicable water quality standards or is not expected to meet those standards even after the application of the effluent limitations required by sections 301(b)(1)(A) and 301(b)(1)(B) of CWA, and for


\textsuperscript{63} \textit{City of Taunton}, at *39.
which the State or interstate agency has performed a pollutants load allocation for the pollutant to be discharged, must demonstrate, before the close of the public comment period, that:

1. There are sufficient remaining pollutant load allocations to allow for the discharge; and

2. The existing dischargers into that segment are subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards. The Director may waive the submission of information by the new source or new discharger required by paragraph (i) of this section if the Director determines that the Director already has adequate information to evaluate the request. An explanation of the development of limitations to meet the criteria of this paragraph (i)(2) is to be included in the fact sheet to the permit under §124.56(b)(1) of this chapter.64

This provision bans new discharges to impaired waters, even those that are offset by claimed reductions from other sources, unless “a TMDL has been performed and the [permittee] demonstrates that before the close of the comment period two conditions are met, which will assure that the impaired waters will be brought into compliance with the applicable water quality standards.”65 These two conditions require MPCA to show that there is sufficient remaining pollutant load allocations to allow for the discharge and that the existing dischargers are subject to “compliance schedules designed to bring the segment into compliance with water quality standards.”66 In other words the new discharge can only be permitted if it “can demonstrate that, under the TMDL, the plan is designed to bring the waters into compliance with applicable water quality standards.”67 There is nothing in the Clean Water Act “that provides an exception for an

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64 40 C.F.R. § 122.4(i).
65 Friends of Pinto Creek v. U.S. Env’tl. Prot. Agency, 504 F.3d 1007, 1012 (9th Cir. 2007), cert. denied, 555 U.S. 1097 (2009); see also 33 U.S.C. § 1251; 40 C.F.R. § 122.4(i). Friends of Pinto Creek interprets federal statutes and regulations that the Minnesota Supreme Court analyzed in Minn. Center for Environmental Advocacy v. Minn. Pollution Control Agency, 731 N.W.2d 502 (Minn. 2007) and is more authoritative because Minn. Center for Environmental Advocacy relied on a decision overturned by Friends of Pinto Creek.
66 40 C.F.R. § 122.4(i)(2).
67 Friends of Pinto Creek, 504 F.3d at 1012.
offset when the waters remain impaired and the new source is discharging pollution into that impaired water.”

MPCA also may not authorize any activities that will contribute additional nitrate and *E. coli* from nonpoint sources to impaired waters. Impaired waters that could be impacted by the project include reaches of the South Fork of the Whitewater River, Garvin Brook, Peterson Creek, and Rush Creek. These reaches are impaired by bacteria and nitrates, and the applicable TMDLs demand reductions of these pollutants so that the water quality standards can be attained.

The MPCA must consider the following:

- Rush Creek, a trout stream directly impacted by Daley Farm’s land application sites, is so contaminated by bacteria that MPCA has determined the *E. coli* must be reduced in the watershed in order to meet water quality standards. To that end, MPCA has adopted a TMDL that specifies that all CAFOs in the watershed upstream of the outlet of the South Fork Root River must have a zero discharge of *E. coli*:

  CAFOs in the RRW were assigned a WLA of 0. Their role as a source of bacteria is discussed in Section 3.6.2.1. By assigning the allowable load to 0, it sets the strictest requirements for CAFOs - i.e., they are not allowed to discharge manure to surface waters, which should not occur in the first place if permit language governing them are properly followed.

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68 Id.
70 Id. at 81.
In addition, the TMDL makes clear that *E. coli* will continue to exceed water quality standards unless other unregulated agricultural sources of *E. coli*, such as livestock facilities and land application of manure, reduce or eliminate *E. coli* contributions.\(^71\)

- Likewise, the trout stream portions of the Whitewater River, South Fork (AUID: 07040003-512) and Garvin Brook (07040003-524) are also impaired by bacteria and the TMDLs for these reaches allocate a “zero” discharge of fecal coliform to the Daley Farms of Lewiston and require reductions from other unregulated agricultural sources of fecal coliform, such as livestock facilities and land application of manure.\(^72\)

- The Peterson Creek watershed, which includes acres on which Daley Farms plans to spread manure, is also impaired by bacteria. MPCA estimates that there needs to be an 57% reduction in *E. coli* loading before this creek will meet water quality standards and be suitable for recreation.\(^73\)

- Nitrate pollution is also widespread in the watersheds where the Daley Expansion is located and anticipates spreading manure. MPCA has established a TMDL that includes reductions needed to meet nitrate water quality standards for the South Fork of the Whitewater watershed, where Daley Farms is located and intends to spread manure. Under this TMDL, there are zero nitrate allocations for Daley Farms. In addition, the

\(^{71}\) *Id.* at 78.


TMDL identifies needed reductions from nonpermitted sources such as nitrate leaching loss from agricultural lands where nitrogen fertilizer and manure are land applied.\footnote{Id. at 2, 94-96.}

- MPCA has identified nitrate as the stressor causing impairment in Rush Creek but has not yet established a TMDL assigning appropriate load allocations and waste load allocations needed to bring the stream into compliance with applicable water quality standards. Therefore, no new discharges of nitrate that will reach these impaired surface waters are authorized.

As noted above, the proposed NPDES permit and manure management plan will likely result in a discharge of nitrate and bacteria to these waters that have no capacity to assimilate additional pollution. The MPCA has not shown, as required by federal law, that there are sufficient pollutant allocations for the Daley Expansion. For this reason, MPCA must deny the Daley Expansion NPDES permit until the facility meets the conditions in 40 C.F.R. \S 122.4(i) and the three TMDLs that apply to the Daley Expansion site and areas where manure generated at this facility will be landspread.

\section*{V. THE PROJECT ENDANGERS HUMAN HEALTH AND THE ENVIRONMENT.}

Issuance of the draft NPDES permit is inappropriate because the project’s operations and discharges will create the potential for significant environmental effects. When those effects include threats to the public health that cannot be removed by permit modifications, the permit must be denied.\footnote{Minn. R. 7001.0140, subp. 2.} The current proposal would create just such a risk, and that risk is inherent to the location itself, the large quantity of liquid manure that is proposed to be land applied, and the
karst geology underlying Winona County. Simple modifications like acquiring more land application acres will not address the public health threat.

The overapplication of liquid manure and the existence of sinkholes, fractured bedrock, fissures, and other karst features near the proposed site and the land application sites constitute a threat to the public health justifying denial of coverage under the permit.\textsuperscript{76} Nearly every stream or river nearby the Daley Expansion is contaminated by agricultural pollutants including nitrate and bacteria, such as \textit{E. coli} and fecal coliform. In the townships where Daley proposes to land apply 46 million gallons of manure per year, about 40\% of private wells that have been tested register above the health risk limit ("HRL") for nitrate, with some wells testing at over 4 times the safe levels of nitrates.

<table>
<thead>
<tr>
<th>Township</th>
<th>% Private Wells &gt; HRL</th>
<th>Max Nitrate Level Recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utica</td>
<td>46.5%</td>
<td>27.9 mg/L</td>
</tr>
<tr>
<td>Fremont</td>
<td>54.8%</td>
<td>43.8 mg/L</td>
</tr>
<tr>
<td>Saint Charles</td>
<td>34.1%</td>
<td>34.8 mg/L</td>
</tr>
</tbody>
</table>

*the results are based on data collected by the Minnesota Department of Agriculture’s Township Testing Program.

The Daley NPDES permit threatens to further contaminate public drinking water supplies:

- Six of the Daley Expansion’s proposed manure application sites are within the Utica Drinking Water Supply Management Area ("DWSMA"), which is rated "Highly Vulnerable."\textsuperscript{77}
- The public water supply for Utica, located within 2 miles of the Daley site, is at serious risk and has registered over the nitrate HRL in recent years.
- Bacteria levels are reaching unsafe levels in public water supplies in the area where Daley is located and plans to landspread manure. Between 2011 and 2016, coliform was registered as present in the noncommunity water supplies of Trout Valley Trail in Lewiston; 3 locations in nearby St. Charles: Discount Grocery, Berea Moravian Church,

\textsuperscript{76}Minn. R. 7001.0140, subp. 2.
\textsuperscript{77}See Map of Manure Application Acres Proposed at Daley Farms & Drinking Water Supply Management Area Vulnerability, attached as Exhibit 3.
and SEMA equipment; and the Whitewater State Park and Wildlife Management Area in Altura.78

There is a reasonable basis to dispute the underlying optimistic assumptions that the project will not apply liquid manure at rates that will contribute pollution to surface water and groundwater and surface water via karst features, fractured bedrock, sinkholes, and sinkholes that will convey manure to groundwater and threaten the public health. The land application sites are within watersheds, which are already contaminated with bacteria, nitrate, and nitrate caused aquatic toxicity.79 The connection between land application of liquid manure and groundwater contamination is established by the evidence already extant.

Finally, Daley Farms is located in an area with “high” sinkhole probability that is also highly susceptible to groundwater pollution.80 The groundwater impacts of a catastrophic manure pit failure would be immediate and severe, and the size of the proposal ensures that this threat cannot be eliminated by permit modifications.

VI. REQUEST FOR A CONTESTED CASE ON DISPUTED ISSUES OF MATERIAL FACT

The Commissioner must grant a petition to hold a contested case hearing if the Commissioner finds that:

A. there is a material issue of fact in dispute concerning the matter pending before the board or commissioner;

B. the board or commissioner has the jurisdiction to make a determination on the disputed material issue of fact; and

C. there is a reasonable basis underlying the disputed material issue of fact or facts such that the holding of a contested case hearing would allow the introduction of information that would aid the board or commissioner in resolving the disputed facts in making a final decision on the matter.81

Above, Petitioners have set forth the materiality of the issues of fact that are in dispute. Petitioners have further provided the basis underlying the material and disputed issues illustrating that a contested case hearing on the following material issues would aid the Commissioner in making a final decision as to whether MPCA should issue an NPDES permit for the Daley Expansion.

1. The project’s Manure Management Plan ("MMP") will allow application of manure at rates that exceed agricultural utilization of the nutrients, in violation of 40 C.F.R. § 412.4(c), 40 C.F.R. § 122.42(e) and Minn. R. 7020.2225, subp. 3;

2. The project’s land application practices will apply manure in a manner that will result in subsurface discharges of manure to groundwater, rendering the project ineligible for permit coverage and violating Minn. R. 7020.003, subp. 1 and 7020.2225;82

3. Whether the MMP—allowed practices of overapplying manure and applying manure to croplands featuring sinkholes and other karst features such as fractured bedrock, fissures, sinkholes and other conduits, have the reasonable potential to cause or contribute to water quality standard exceedances for nitrates and bacteria, rendering the project ineligible for permit coverage and violating 40 C.F.R. § 122.44(d)(1);

81 Minn. R. 7000.1900, subp. 1.
82 Permit at 13.4 ("Permittee shall not discharge from the facility, by overflow or other means, manure, manure-contaminated runoff, or process wastewater to a sinkhole, fractured bedrock, well, surface tile intake, mine quarry, or other natural or constructed channels that convey fluids to groundwater.").
4. The project’s MMP will result in discharges to waters of the U.S. through hydrologically connected groundwaters, rendering the project ineligible for permit coverage and violating Minn. R. 7020.2003, subp. 2;

5. The MMP’s allowed practices of overapplying manure and applying manure to croplands featuring sinkholes and other karst features will cause or contribute to a violation of water quality standards and for which the state has performed a pollutant load allocation, where the agency has not demonstrated there are sufficient remaining pollutant load allocations to allow for the new discharge, in violation of 40 C.F.R. § 122.4(i) and state law;

6. The MMP endangers human health and the danger cannot be removed by a modification of the conditions of the permit;\(^{83}\)

Petitioners attach expert reports which reference numerous documents that support the issues identified in these Comments and Petition. Petitioners expect to call the following experts as witnesses if the Commissioner agrees to convene a contested case hearing on the issues that Petitioners identified:

- **Dr. Gyles Randall**, Professor Emeritus, University of Minnesota, Department of Soil, Water and Climate. Ph.D., M.S., B.S., Soil Science.

VII. CONCLUSION

For the foregoing reasons, issuance of an NPDES Permit would authorize the Daley Expansion to further pollute the surface water and drinking water in Winona County and would be unreasonable and unlawful. Issuance of an NPDES permit authorizing an enormous increase in the amount of manure produced at Daley Farms will result in discharges of nutrients,

\(^{83}\) Minn. R. 7001.0140, subp. 2.
pathogens, and pharmaceuticals to ground and surface waters, in violation of federal and state law. Should the agency decide to issue and NPDES permit for the Daley Expansion, Petitioners assert that the factual disputes concerning material facts critical to the agency’s permit determinations must be referred to the Office of Administrative Hearings for resolution in a contested case hearing.

Respectfully submitted,

/s/ Betsy Lawton

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EXHIBIT 1
Review of Portions of the Daley LLP Proposed Dairy Expansion

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Waseca, MN 56093

The following review was based on the Environmental Review Documents found on the Daley Farm LLP Application Materials document placed on the MPCA website on October 2, 2018.

Land Application and Nutrient Management: Land application of manure is a highly significant economic and environmental portion of this project. Forty two field sites were identified as Manure Application Sites (MAS) to receive land-applied manure each year. The Daley’s own 31 sites and have written or verbal agreements with the other 11 sites. Three of the sites are located about 6-8 miles southeast and south of interstate I 90. Karst features including sink holes are found within or near 20 of the MSA. On 27 of the sites Daley will need to use specific field practices to reduce the likelihood of nitrates leaching to the ground water. Many of the sites were not uniform in size or shape, but were very chopped up with setbacks, Karst features, water wells, water courses including grass water ways and intermittent streams. Custom manure applicators prefer to apply manure in a pattern where they go back and forth from end to end working their way either to the right or to the left across the field. This pattern provides the most uniform application where all areas receive manure and skips are rare. Uniform pattern application will be very difficult on many of these designated MAS.

The silt loam soils found at all of the MAS are excellent for manure application and are highly productive. The Port Byron soil type, a dominant soil at many of these MAS, is arguably the best, most highly productive soil in the state. Steep slopes within these soil types can be a very limiting factor in terms of soil erosion and even crop yield. Sometimes the soils are very shallow to bedrock, which limits crop yields and enhances nitrate loss to ground water.

Each of the 44 MAS (two original MAS were split into two parts making a total of 44 MAS) were evaluated for in-field characteristics including dominant soil types, slopes, topography, shallow soils to bedrock, Karst features, setbacks and water courses. Conditions surrounding each field such as residences and sink holes along with soil test phosphorus (P) were not included in the evaluation. Each MAS was then given a rating: Good, OK with extra application care needed, and Poor. There were 20 Good sites, 14 OK sites and 10 Poor sites. The three sites in the Lewiston DWSMA were all rated Good while the Utica DWSMA had 3 Good sites, 3 OK sites, and 1 Poor site. The ratings were primarily based on soil type, slope, and depth to bedrock (shallow soils).

Many of the Poor sites contained soils with slopes ranging from 7 to 20% and/or significant areas of shallow soils to bedrock. Slopes over 6% are more conducive to soil erosion, especially in the knifed-in manure strips that lead up and down the hill slopes. In the spring with snow melt and rainfall, significant erosion can occur, leading to pollution of surface waters. Shallow
soils often have insufficient stored available water, leading to poor crop yields and inefficient use of the manure causing excess levels of nitrate available for leaching to ground water.

These findings lead one to seriously question whether there are enough acceptable soils in this proposal to receive the manure produced from this dairy expansion project without significant and unacceptable surface water contamination (sediment, manure, and pathogens) or ground water pollution (nitrate- nitrogen).

**Nutrient Management:** Issues of concern are listed below:

1) Page 311, Table A, Fertilizer Recommendations for Agronomic Crops in Minnesota is a 2001 publication. There have been numerous updates since 2001. For nitrogen, the Corn N Rate Calculator has been in use since 2006 and is the preferred method for obtaining N recommendations for corn after corn and after soybeans. The N rate recommendations for corn following alfalfa have also been changed since those used in this document. The recommended N rate used in this EAW for corn after corn is 180 lb N/acre and following soybeans is 140 lb N/acre. The Corn N Rate Calculator gives maximum rate of economic return (MRTN) N rates for corn after corn as 159 lb N/acre and after soybeans as 123 lb N/acre. The N rate recommendations in this EAW should be updated to be consistent with the present time.

2) The Bray P soil tests of these MAS are very high (page 410). A Bray soil test P (STP) of 21 ppm or more is considered to be very high in Minnesota. The STP values from the hundreds of samples shown in the EAW document range from 11 ppm to 282 ppm. Twenty four soil samples tested >100 ppm. Only two MAS tested < very high – Lappiers and Orlies, both south of interstate I 90. All others were >25 ppm or very high. The three 2018 tests ranged from 93 to 136 ppm. These very high STP levels may pose a challenge to meet the goals of the MMP. Moreover, these very high levels of STP are a significant environmental concern to surface waters if there is runoff or erosion from these sites. Thus, the concern with applying manure to the MAS that have considerable areas with >6% slopes.

3) On page 158, why is 15,000 gal/acre being recommended for silage corn and 14,000 gal/acre for corn grain? I do not see a reason for this difference.

4) Why is the TKN of last year’s manure 58% lower (13 lb/1000 gal) than the Book value of 31 lb/1000 gal? Is this low amount of TKN typical of sand-based, open-pit, lagoon manure? Additional TKN tests providing an accurate summary of N content are critical for this project? For instance, the acreage needed for 26 lb TKN/1000 gal manure is twice that of 13 lb TKN/1000 gal of manure. In this project the very low N content is definitely an advantage to Daley Farms.

5) On page 1058 in the 6-Yr Soil Phosphorus Management Plan under scenario #1, applying 14,000 gal of manure for three consecutive years of corn with 25% carryover in year 2 and 25%+ again in year 3, one would be applying excessive N in that scenario. This should be changed.

6) Will soil NO3 or NH4 tests be used when manure is applied to a field for consecutive years? If so, when and how?
**Conclusion:** Between site characteristics of the designated MAS including very high STP levels, sloping soils, shallow soils, numerous setbacks, and the improper N recommendations being used in the EAW, I am very concerned about the success of the proposed dairy expansion project. The large amount of manure being produced appears to require more “manure friendly” land area than has been designated in the 42/44 MAS, unless manure is applied to the strongly sloping and shallow soils, which will lead to significant environmental concerns.
EXHIBIT 2
Nitrogen BMP’s for Corn in Minnesota

Gyles Randall
Soil Scientist (Retired) and Professor Emeritus
University of Minnesota

The purpose of this report, prepared for the Minnesota Center for Environmental Advocacy, is to review and assess the Minnesota Department of Agriculture’s (“MDA”) current proposal (Nitrogen Fertilizer Rule) to adopt restrictions on the fall and winter application of nitrogen fertilizer and adopt a “menu” of potential water resource protection requires (“WRPR”) that could be required in specific areas of the state via an order of the Commission of the Department of Agriculture.

MDA is currently proposing to:
1) Restrict application of nitrogen fertilizer in the fall or to frozen soils in areas of the state overlying vulnerable groundwater.
2) Identify mitigation level areas based on well water sampling for nitrogen-N concentrations and adopt WRPR’s for mitigation levels 3 and 4.

While MDA’s proposal for adoptions of WRPRs is directionally correct, MDA’s proposed WRPRs are not designed to, and cannot independently, prevent and minimize the nitrate pollution to the extent practicable; or prevent nitrate pollution from exceeding the health risk limit.

The University of Minnesota’s recommended Best Management Practices (BMP’s) for nitrogen fertilizer use are found in a series of University of Minnesota Extension bulletins written for specific geographic areas of the state and were published in 2008. These recommendations fall within and provide specifics for the currently popular 4R approach (right application rate, right source, right time of application and right placement). These BMP’s were developed from research based on yield optimization and the production economics of corn and not specifically on water quality indices. Environmental metrics such as nitrate concentration in drainage water or in the soil at the end of the growing season have been frequently measured along-side of agronomic and production metrics over a 33-yr period by this scientist in research studies located at Waseca, Lamberton and in southeastern Minnesota. In the future, scientists must collect agronomic and environmental data side by side in numerous studies located around the state if a robust data set is to be built, allowing N BMP’s for Minnesota to be based on agronomic, economic and environmental water quality measurements.
Summary

General Recommendations

- Using the right/correct rate of N is a foundational BMP from an economic and water quality perspective. Of all fertilizer N management practices, rate of application has the greatest potential for influencing nitrate losses to ground and surface waters. When determining the total N rate to apply, all forms of N should be included, i.e., N in starter fertilizer, weed and feed N, and ammonium-N in phosphate fertilizers. Nitrogen credits from previous crops and manure applications, requiring record keeping by the farmer, should also be included. Two additional practices that are sometimes associated with N rate decisions must be discontinued. They are: (a) application of excess “insurance” N generally associated with fall application and (b) using yield goal multiplied by a set K factor to determine the N rate needed. Neither of these practices is economically or environmentally sound.

- Spring application of N fertilizers is highly recommended regardless of N source. Corn grain yields are higher and nitrate losses are lower.

- No N is to be fall-applied to medium-textured SE Minnesota soils, coarse-textured sandy soils, and vulnerable soils throughout the state.

- Use split applications of N on coarse-textured soils.

- Incorporate broadcast or inject sidedress applications of urea and UAN into moist soil to a minimum depth of three inches.

- Restrict present “Acceptable, but with risk” BMPs if nitrate levels in ground and surface waters increase or BMPs are not used.

- Ag advisers (retailers, consultants, etc.) play a huge role in educating farmers and in advocating universal use of the 4Rs (right rate, right time, right source and right placement).
  - record keeping may be needed and should be considered in the more vulnerable areas and for fall application

- Cover crops perform quite well in Minnesota if planted by Sept. 1 when following sweet corn, peas, small grains, or corn harvested for silage. Innovative, newly developed planting equipment or aerial seeding may be successful for establishing cover crops in corn and soybeans well before harvest but risk of failure needs to be acknowledged.

- Use nitrification inhibitors (NI's) such as N-Serve and urease inhibitors (UI's) such as Agrotain and Limus when they are appropriate for reducing losses of yield and N.
• Shifting a small portion of Minnesota’s corn acres to other non-N demanding crops, such as alfalfa into crop rotations or establishing perennials on marginal land areas would likely reduce nitrate losses more than simply implementing N BMPs for the current corn and soybean dominated landscape.

Primary BMP recommendations for southern Minnesota

Recommended
• Spring preplant application of ammonia and urea or split applications of ammonia, urea, and UAN are highly recommended.
• Under rain-fed (non-irrigated) conditions, apply sidedress N before corn is 12 inches tall (V7 stage).
• When soils have a high leaching potential (sandy texture), nitrogen application in a split application or sidedress program is preferred. Use a nitrification inhibitor (N-Serve) on labeled crops with early sidedressed N.

Acceptable, but with greater risk
• Fall application of ammonia + N-Serve after soil temperature at the 6-inch depth is below 50ºF in south-central Minnesota.
• Late fall or spring preplant application of ESN in south-central Minnesota.
• Spring preplant application of ESN in southeastern Minnesota.
• Spring preplant application of UAN.

Not Recommended
• Fall application of ammonia, urea, and UAN, with or without a nitrification inhibitor (N-Serve) in the 7-county area of southeastern Minnesota.
• Fall application of N to coarse-textured (sandy) soils.
• Application of any N fertilizer including MAP or DAP on frozen soils. (runoff in spring snow melt can be significant)
• Fall application of urea and ammonia without N-Serve and urea with N-Serve in south-central Minnesota.
• Fall application of UAN (28-0-0).

Field research recommendations
• Continue to conduct N rate research studies to determine corn yield response, net return to fertilizer N, N recovery in the corn plant, and residual soil nitrate in the soil profile in the fall after harvest and again the following spring (to determine leaching losses) on the medium-textured soils of SE Minnesota and similar vulnerable soils of the state. Collection of soil water at 5’ or tile drainage would be helpful. These complete sets of production and environmental data will be relied upon and necessary to make improved N management decisions for Minnesota in the future.
• Conduct cover crop research to increase the success of earlier fall establishment or to select/develop those cover crops that tolerate limited light in dense corn stands in August. Perhaps combining cover crops with lower vegetative biomass corn hybrids would allow for improved early fall establishment. Research comparing the economic risk of reduced corn yields with different N management and cover crop scenarios vs. the environmental benefit of reduced nitrate losses to ground water should be conducted.

• Crop rotation research involving a year or two of alfalfa in a rotation such as C-S-C-A-A or other crops is encouraged. Determining the efficacy of these rotations to reduce nitrate losses to ground and surface waters while optimizing net return would be particularly valuable in the vulnerable soils within areas of “high dairy cattle numbers”.

**General Conclusions**

Will the 4R approach be successful in reducing nitrate-N losses to surface and ground water to meet the goals of Nitrogen Loss Reduction Strategies being established?

My answers are:

1) The 4R approach is directionally correct and helpful but will not accomplish the goal by itself in a landscape almost completely dominated by corn and soybean.

2) Universal commitment will be needed within the agricultural community (ag advisers, retailers, consultants, farmers, land owners, commodity groups, agricultural interest groups, etc.) to advance the 4R concept consistently and quickly.

3) Shifting acreage away from corn to other crops not requiring N or other cropping systems is the most effective strategy as it decreases N inputs to the landscape consequently reducing N losses significantly to ground and surface water.

4) Nitrate losses to ground and surface water are quickly and substantially reduced by perennial crops compared to annual crops. Shifting some of the least productive row-crop acreage to perennial-based conservation practices could reduce nitrate losses significantly while minimizing soil erosion and sediment losses to water bodies. Crop diversification has numerous ecosystem benefits compared to the current and dominant corn-soybean rotation.
Review of Current Draft NFR

After thoroughly reviewing the 5/24/17 version of MDA’s NFR, the following three statements register my concerns and suggested revisions that should be considered.

1) The statement “after no fewer than three growing seasons, the commissioner shall conduct a re-evaluation” appears in lines 9.2-9.3, 9.12, 9.20, 14.17, 14.21 and 15.20. This seems to be an easy way to simply extend it to 4, 5, 6 or more growing seasons. Or will three growing seasons be firm unless extenuating conditions occur? Deleting “no fewer than” is suggested.

2) On page 11, line 11.19 states “i. for corn, using the acceptable range for the 0.10 ratio for corn at a minimum as defined in Fertilizing Corn in Minnesota”. Because the N rate range often has a range of 20 to 30 lbs. N/acre, I am concerned that the high end of the N rate range will often be used by corn producers. Using the high N rate in this range is not likely to reduce nitrate concentration below the health risk level as frequently as the low end of the N rate range. Therefore, I would strongly suggest replacing acceptable range with MRTN (Maximum economic Return to N). Making this change to MRTN would mean using the N rate that is midway between the high and low N rates of the range. For instance, if the range is from 140 to 170 lb. N/acre the MRTN would be 155 lb. N/acre. The 155 lb. N rate is the most economically optimum rate and would be a better environmental rate than the highest N rate (170 lb.) in the range. This change is especially important when dealing with mitigation levels 3 and 4. It is likely that the highest N rate in the range would lead to increased nitrate concentrations rather than reduced concentrations.

The N rate situation becomes worse when southern Minnesota producers use Iowa State University base MRTN recommendation rates, which are 20 to 30 lb N/A greater than Minnesota’s recommendations. If the producers or retailers use the high end of the Iowa MRTN range, the application rate becomes 30 to 40 lb N/A greater compared to Minnesota’s base MRTN rate recommendation.

3) Under Subpart 1. Mitigation level 3 on pages 24 & 25, another BMP should be added. I suggest: M. crop diversification including perennial crops and alternative species not requiring N fertilization such as a 5-yr crop rotation with at least one year of alfalfa, grass-dominated cover-crops, and perennial grasses on buffers and marginal land areas.
History
A series of BMP’s were identified and assembled by the University of Minnesota and the Minnesota Department of Agriculture (MDA) as part of the Nitrogen Fertilizer Management Plan developed by the Nitrogen Fertilizer Task Force coordinated by MDA in 1990 and 1991. A series of seven (7) bulletins were developed for specific areas of the state (generally based on specific soil and climatic conditions) and were published by the Minnesota Extension Service in 1993. These N BMPs were broadly defined as “economically and environmentally sound, voluntary practices that are capable of minimizing nutrient contamination of surface and groundwater”.

Based on numerous N research experiments between the early 1990’s and 2005, involving both crop production and nitrate-N loss data, another set of management guidelines were developed to assist crop producers to manage their nitrogen in ways that optimize profitability, reduce risk, and minimize loss of nitrate to surface and groundwater. Similar to the 1993 publications, these voluntary management practices were published in a series of U of M Extension bulletins in 2008 to be adopted on a statewide as well as a regional basis. In these publications, the management practices (BMP’s) have been divided into three categories: (1) recommended, (2) acceptable but with greater risk, and (3) not recommended. The risks can be either economic (input cost or yield) or environmental (potential for loss of nitrogen to ground or surface waters).

Nitrogen Management Practices

Rate of N Applied
Using the correct amount of N as opposed to extra “insurance” N optimizes crop yield while minimizing N loss to the environment. However, there are two factors leading to the optimum N rate: (1) N becoming available from the soil and (2) N added as fertilizer N to meet the crop’s total N need. Unfortunately, two uncontrollable factors (precipitation and temperature) affect the release of N from the soil as well as the amount of N needed by the crop.

For many years the optimum N rate for corn in the Midwest was determined by multiplying the yield goal times a factor of 1.2, i.e., 160 bu/A x 1.2 = 192 lb N/A minus N supplied by the previous crop. Nitrogen fertilizer recommendations in Minnesota used a somewhat similar process, but they also included the level of soil organic matter. By the late 1990’s this method of determining the rate of N to apply was being questioned by Minnesota and Midwest agronomic scientists. Consequently, a massive effort by them involved the collection and interpretation of data from hundreds of fertilizer N rate response studies with corn in Illinois, Iowa, Minnesota, and Wisconsin. The data showed yield goal was not a good predictor of the N rate needed. Instead, the recommended rate of N to apply was determined to be within a range of N rates, depending on the productivity of the soil, previous crop, and the ratio of the price of fertilizer N to corn price. Each year additional N rate studies are conducted in all states.
to increase the size and value of the database and to include the newest corn genetics and higher yield potentials.

For southern Minnesota with 109 sites, the range of N rates for corn after corn and corn after soybeans using a fertilizer N price of $0.35/lb and a corn price of $3.50/bu is 141-160 lb/A and 98-122 lb/A, respectively. The maximum economic return to N (MRTN) is 149 and 108 lb/A, respectively. Thus, on highly productive soils a N rate of 149-160 lb/A is recommended for corn after corn and 108-122 lb/A for corn after soybeans. On lower productively soils where the yield potential is less due to limited water holding capacity, the recommended N rates are 141-149 lb/A for corn after corn and 98-108 lb/A for corn after soybeans.

As one can see from this discussion the recommended N rates for corn are based totally on the production economics of corn as influenced by a large N rate response database and soil productivity. The economics or risk of N loss to ground or surface waters is not included because it is an uncontrollable factor and is not predictable at the time of N application.

Rate of N application has a huge effect on corn yield/production and on nitrate-N losses on both well-drained and poorly-drained soils. On a well-drained Port Byron soil in Olmsted Co., three-year average continuous corn yields ranged from 65 bu/A with 0 lb N/A to 164 bu/A with 140 lb N/A. Residual nitrate-N in the 0-7' soil profile after harvest with the 0, 90, 120, 150 and 180 lb N/A rates averaged 35, 45, 65, 110 and 140 lb nitrate-N/A. These data clearly show the huge yield response to fertilizer N coupled with the large amount of nitrate-N remaining in the soil in the fall when the applied N rate was above optimum. These high levels of residual N would be expected to leach from the 0-7' profile into the groundwater aquifers between Nov. 1 and mid-June the next year when corn roots would be taking up soil N and fertilizer N again. In a 5-yr study on the same soil, corn yields following soybeans averaged 72% of maximum yield with no fertilizer N (In other words, the soil supplied 72% of the N needed for maximum yield. The remaining 28% would come from fertilizer N). When 90 lb N/A was applied, yields reached 97% of maximum yield. When rates of 120 and 150 lb N/A were applied, yields attained 100% of maximum. Residual nitrate in the 0-5' soil profile after harvest (Nov. 1) totaled 30, 40, 75 and 95 lb NO3-N/A for the 0, 90, 120 and 150 lb N/A fertilizer N rates. These data also support the high potential for large leaching losses of nitrate to groundwater aquifers when N rates applied are in excess of optimum.

In poorly drained soils the effect of N rate on corn yield, profitability, and nitrate loss to tile drainage is shown in Table 1. Compared with the standard 120-lb N rate applied in the fall, adding an additional 40 lb N/A (160-lb N rate) increased yield 6 bu/A (4%), increased net profit by $7/A (5%), and increased NO3-N concentration in tile water by 4.9 mg/L (37%). In other words, the economic gain from excess N was small compared to the large environmental effect of increased nitrate loss to water. On the other hand reducing N rate from 120 lb N/A to 80 lb/A reduced yield 22 bu/A (13%), reduced net profit $63/A (45%), and reduced NO3-N concentration in the water by 1.7 mg/L (13%). Greatest yield and profit with a minimal increase in NO3-N concentration (4%) was found with the spring-applied 120-lb N rate. (Net profit was calculated using corn = $3.50/bu, N fertilizer = $0.35/lb N, and N-Serve @ $10/A). These data clearly demonstrate two fundamental findings: (1) the importance of using the correct N rate as a cornerstone BMP from an economic and water quality perspective and (2) the net
return advantage (42%) of applying the correct rate of N in the spring compared to the fall with minimal effect on NO$_3$-N concentration (4%).

Table 1. Effect of N rate on yield of corn after soybean and nitrate-N concentration in tile drainage at Waseca (2000-2003).

<table>
<thead>
<tr>
<th>N Treatment</th>
<th>4-Yr Yield</th>
<th>4-Yr FW NO$_3$-N conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Rate</td>
<td>N-Serve Avg.</td>
</tr>
<tr>
<td>---</td>
<td>lb/A</td>
<td>bu/A</td>
</tr>
<tr>
<td>Fall</td>
<td>80</td>
<td>Yes</td>
</tr>
<tr>
<td>Fall</td>
<td>120</td>
<td>Yes</td>
</tr>
<tr>
<td>Fall</td>
<td>160</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Compliance with applying the correct rate ("Right Rate") of fertilizer N does not come easily and without well-ingrained attitudes, thoughts, perceptions, and challenges from a variety of positions. First, because the price of N fertilizer has generally been low compared to crop price and because wet growing season conditions can cause loss of N, farmers will often apply an extra 20 to 50 pounds of "insurance N" to ensure that yield-limiting conditions do not occur due to insufficient N. This is particularly true in years when crop prices are high and the potential exists for a high net economic return to fertilizer. Second, no farmer, dealer, ag adviser/consultant or landlord likes to see N deficiency symptoms (yellow corn) occurring, especially early in the season. Dark green, robust, even-looking corn is a "hallmark" visual assessment of a grower's ability to profitably produce corn. Yellow, N deficient corn has been known to terminate land rental agreements. Third, N credits from previous crops and previous manure applications vary if various crops were grown and manure sources and rates differed from field to field. This requires careful record keeping if correct N rates are to be applied for each field. Fourth, the amount of soil N mineralized to become available for the growing crop can be variable and is at this time not easily predictable. Thus, applying a slightly greater amount of fertilizer N is often done. Fifth, farmers often do not make their own fertilizer N rate recommendations; they rely on their retailer/dealer or on an ag adviser/consultant. This can present a problem, especially for the retailer who has a service and a product to sell. Trimming the "safe" higher-than-recommended rate to the correct/right rate of fertilizer N may be good for the farmer and the environment, but it may not be good for the retailer’s bottom line because of reduced fertilizer sales volume - - - a primary profit stream for them. This can put the retailer on a slippery slope especially if part of the service required by the farmer is to minimize loss of nitrate to ground and surface waters. Consultants on the other hand have a service to provide and sell, but no fertilizer product to sell. Thus, they can adopt their fertilizer recommendations more easily to a correct/right rate of application that considers the risks of both profitability and environmental losses of N to ground and surface waters. Sixth, the total N rate should include any N applied in a starter, weed and feed program, and contributions from phosphorus fertilizers such as MAP and DAP. Also, appropriate credits must be taken for previous legume crops and any manure used in the crop rotation. Seventh, historically fertilizer N recommendations have been made only from
the production perspective. Combining an environmental perspective with the production perspective may take time for some fertilizer N advisers, but adapting to change rather quickly with good record keeping will be a successful approach for improved water quality and profitable production.

In summary using the correct/right rate of N has a high potential for improving net economic return for farmers while minimizing the loss of nitrates to ground and surface waters.

**Time of N Application and N-Serve**

Time of N application has been an issue in the northern latitudes of the U.S. since anhydrous ammonia (AA) became available in the 1950’s. The thinking was that fall N would not be lost from soils that were frozen for 3-4 months during the winter. As a result, AA was being applied as early as the first week of October in the 1970’s. Under warm conditions when the fall soil temperature was in the 60’s, significant conversion of AA to nitrate (nitrification) occurred, which was then lost via leaching or denitrification. Since the rate of AA nitrification is a function of soil temperature, research on the process indicated that nitrification was slowed substantially at soil temperatures < 50ºF. Research on nitrification inhibitors (NI’s) such as N-Serve in the 1970’s and 80’s in Minnesota showed that they significantly inhibited nitrification. As a result the following BMP guidelines for fall application of N in southern Minnesota have existed since 2008:

**Not Recommended**

- Fall application of ammonia, urea, and UAN, with or without a nitrification inhibitor (N-Serve) in the 7-county area of southeastern Minnesota.
- Fall application of N to coarse-textured (sandy) soils.
- Application of any N fertilizer including MAP or DAP on frozen soils. (runoff in spring snow melt can be significant)
- Fall application of urea and ammonia without N-Serve in south-central Minnesota.
- Fall application of UAN (28-0-0).

**Acceptable, but with greater risk**

- Fall application of ammonia + N-Serve after soil temperature at the 6-inch depth is below 50ºF in south-central Minnesota.
- Late fall or spring preplant application of ESN in south-central Minnesota.
- Spring preplant application of ESN in southeastern Minnesota.
- Spring preplant application of UAN.

**Recommended**

- Spring preplant applications of ammonia and urea or split applications of ammonia, urea, and UAN are highly recommended.
- Under rain-fed (non-irrigated) conditions, apply sidedress N before corn is 12 inches tall (V7 stage).
- When soils have a high leaching potential (sandy texture), nitrogen application in a split application or sidedress program is preferred. Use a nitrification inhibitor (N-Serve) on labeled crops with early sidedressed N.

As one can see by the above Time of N recommendations, the influence of soil texture (coarse, medium, and fine), precipitation and characteristics of the N source are dominating factors when determining the suitability of fall-applied N.

The following text describing some of the research conducted in southern Minnesota contains corn production and water (soil and tile drainage) data that support the above Time of N Application recommendations. Southeastern Minnesota is characterized by permeable silt loam soils with underlying fractured limestone bedrock. This “Karst” region, which also receives the greatest amount of annual precipitation in the state, is very susceptible to ground water contamination. Consequently, few studies have examined fall application with spring and in-season N applications receiving most attention. A 4-yr study conducted in Olmsted Co. showed little yield average difference among the time of application treatments, but in the wet year (1990, 1987-89 were dry) fall-applied AA with and without N-Serve produced lower yields and greater NO3-N concentrations in the soil water at 5’ than did spring applications (Table 2).

Table 2. Corn yield and NO3-N concentration in the soil water at 5 feet as affected by rate and time of application in Olmsted Co., 1987-90.

<table>
<thead>
<tr>
<th>Nitrogen Treatment</th>
<th>Grain Yield</th>
<th>Nitrate-N Conc. in Soil Water¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
<td>Time/Method</td>
<td>1990</td>
</tr>
<tr>
<td>lb N/A</td>
<td>- - - - bu/A - - - -</td>
<td>76</td>
</tr>
<tr>
<td>0</td>
<td>75 Spr., preplant</td>
<td>145</td>
</tr>
<tr>
<td>75</td>
<td>“     “</td>
<td>155</td>
</tr>
<tr>
<td>150</td>
<td>“     “</td>
<td>156</td>
</tr>
<tr>
<td>225</td>
<td>Fall</td>
<td>145</td>
</tr>
<tr>
<td>150</td>
<td>Fall + N-Serve</td>
<td>148</td>
</tr>
<tr>
<td>150 + 75</td>
<td>Spr. + SD (V7)</td>
<td>154</td>
</tr>
</tbody>
</table>

¹ Fall, 1990. Determined using porous cup suction samplers.

A long-term study on poorly drained soils in south-central Minnesota, comparing late-October application of ammonia with and without N-Serve with a spring pre-plant application without N-Serve, showed distinct yield and environmental advantages for spring application, but not in all years (Table 3). Across the 15-yr period, corn yields averaged about 10 bu/A greater for the fall N + N-Serve and spring N treatments compared with fall N without N-Serve. Also, compared with fall application of N without N-Serve, NO3-N losses in the drainage water were reduced by 14 and 15% and N recovery in the grain was increased by 8 and 9% for fall N + N-Serve and spring N, respectively. However, corn yields were significantly affected by the N treatments in only 7 of 15 years. In those seven years, when April, May and/or June were wetter-than-normal, average corn grain yield was increased by 15 and 27 bu/A for the fall N + N-Serve and spring N treatments, respectively. In summary, the 15-yr data suggest that
applications of ammonia in the late fall + N-Serve or in the spring preplant were BMP’s. However, when spring conditions were wet, especially in May and June, spring application gave substantially greater yield and profit than the fall N + N-Serve treatment. Therefore, fall N + N-Serve application is considered to be more risky than a spring, preplant application of ammonia. Moreover when N-Serve was not used, fall application of ammonia was more risky (lower yields) compared with fall application + N-Serve.

Table 3. Corn yield and NO\textsubscript{3}-N loss to drainage water as affected by time of application and N-Serve at Waseca, 1987-2001.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Time of Application\textsuperscript{\textdagger}</th>
<th>Fall</th>
<th>Fall + N-Serve</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Yr Avg. Yield (bu/A)</td>
<td></td>
<td>144</td>
<td>153</td>
<td>156</td>
</tr>
<tr>
<td>7-Yr Avg. Yield (bu/A)\textsuperscript{\textdouble dagger}</td>
<td></td>
<td>131</td>
<td>146</td>
<td>158</td>
</tr>
<tr>
<td>Flow-weighted NO\textsubscript{3}-N concentration in tile drainage from the corn-soybean rotation (mg/L)</td>
<td></td>
<td>14.1</td>
<td>12.2</td>
<td>12.0</td>
</tr>
<tr>
<td>Nitrogen recovery in the corn grain (%)\textsuperscript{\textsection}</td>
<td></td>
<td>38</td>
<td>46</td>
<td>47</td>
</tr>
</tbody>
</table>

\textsuperscript{\textdagger} Rate of applications for 1987-1993 and 1994-2001 were 135 and 120 lb N/A, respectively.

\textsuperscript{\textdouble dagger} Only those seven years when a statistically significant yield difference occurred among treatments.

\textsuperscript{\textsection} Nitrogen recovery in the corn grain as a percent of the amount of fertilizer N applied.

A split application of ammonia with 40% applied pre-plant and 60% applied sidedress at the V8 stage was compared with late October and spring preplant applications of ammonia (Table 4). In this 7-yr period, grain yields were significantly greater (6 bu/A) for the split-applied treatments, resulting in slightly greater N recovery in the grain compared with the fall and spring treatments. However NO\textsubscript{3}-N concentrations in the tile drainage were also slightly higher with split-applied N than for the spring N and fall N + N-Serve treatments.

Table 4. Corn production after soybeans and nitrate loss as affected by time of N application and N-Serve at Waseca, 1987-93.

<table>
<thead>
<tr>
<th>N Treatment</th>
<th>Time</th>
<th>N-Serve</th>
<th>7-Yr Average Corn yield (bu/A)</th>
<th>N recovery (%)</th>
<th>Flow-weighted NO\textsubscript{3}-N conc. in tile drainage (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td>No</td>
<td></td>
<td>131</td>
<td>31</td>
<td>16.8</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td></td>
<td>139</td>
<td>37</td>
<td>13.7</td>
</tr>
<tr>
<td>Spring</td>
<td>No</td>
<td></td>
<td>139</td>
<td>40</td>
<td>13.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>145</td>
<td>44</td>
<td>14.6</td>
</tr>
<tr>
<td>LSD (0.10):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>
A 6-yr study comparing fall versus spring application of N-Serve with ammonia showed a statistically and economically significant 10 bu/A yield response to N-Serve applied in the fall (Table 5). The 4 bu/A yield increase to spring-applied N-Serve was not statistically significant and is considered economically neutral. However, a yield response to spring-applied N-Serve occurred in years when June rainfall was excessive. Because these data do not suggest a consistently significant and economical response to N-Serve applied in the spring and because excessive June rainfall can not be predicted at the time of spring ammonia application, adding N-Serve to spring-applied ammonia is not considered to be a BMP at this time.

Table 5: Corn grain yield after soybeans as affected by fall and spring application of N-Serve with anhydrous ammonia at Waseca, 1994-99.

<table>
<thead>
<tr>
<th>N-Serve</th>
<th>Time of application</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>161</td>
<td>171</td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td>172</td>
<td>176</td>
<td></td>
</tr>
</tbody>
</table>

The corn yield data obtained in the above studies clearly support spring applications over fall applications regardless of N source (ammonia or urea). This is especially true when April-June rainfall was above average, causing denitrification and leaching losses of N. In addition, nitrate-N concentrations in tile drainage water were reduced (14 to 18%) with the fall N + N-Serve and spring N applications.

With spring application of N showing these increased corn yields and reduced nitrate losses to water, one would expect most fertilizer N to be spring applied. This is not true in Minnesota, however, as there has been a historic, fall application culture for fall-applied AA by both retailers and farmers when fall conditions allow (crops harvested, soils relatively dry, and soil temperatures cooling to below 50ºF). Fall application is often considered an advantage to either the retailer and/or farmer for the following reasons:

- Logistics – The workload is spread out for the retailer when a portion of the N is fall applied.
- Less storage space is required with a combination of fall and spring application. Storage space can be refilled during the winter.
- Less worry by the retailer about being able to receive and deliver the total amount of N needed in a timely manner. They question whether the fertilizer N infrastructure is able to supply and deliver the fertilizer in a timely manner when only spring applied?
- Fall application is often preferred by the farmer because more time is usually available in the fall.
- If the N is fall applied, the farmer does not need to worry about it in the spring when tillage and planting are the highest priorities. The worries only begin to occur later in the spring if the soils are warm and rainfall is plentiful, causing loss of the fall-applied N.
• Soils are generally more firm and better suited for application without compaction in the fall - favored by both farmers and retailers.
• Fertilizer N is often somewhat cheaper in the fall - an economic plus for the farmer.

N Source and Time of Application

The N source used must also be considered when selecting the proper time of application. Studies at Waseca in 1981 and 1982 compared fall application of anhydrous ammonia and urea, with and without N-Serve, to spring application of the same. Two-year average corn yields (Table 8) indicate: (a) broadcast and incorporated urea was inferior to anhydrous ammonia when fall-applied, (b) spring application of urea was superior to fall application, and (c) a slight yield advantage for spring-applied ammonia compared with fall application was found when averaged across N-Serve treatments.

A subsequent study evaluated late October application of urea (4" deep band) and anhydrous ammonia with and without N-Serve compared to spring preplant urea and anhydrous ammonia. Three-year average yields show a 33 bu/A advantage for urea and a 14 bu/A advantage for ammonia when applied in the spring (Table 6). Nitrogen recovery in the corn plant ranked: spring ammonia = spring urea > fall ammonia > fall urea. The effect of N-Serve in this study was minimal. Yield response to the spring treatments were greatest in 1998, when April and May were warm and late May was wet, and in 1999 when the fall of 1998 was warm and April and May, 1999 were very wet. Significant yield differences were not found in 1997 when the fall of 1996 was cold and the spring of 1997 was cool and dry.

In summary, these studies clearly show reduced corn yield and N recovery for fall-applied urea regardless of N-Serve use. Thus, fall application of urea with or without a nitrification inhibitor (NI) should not be recommended in south-central Minnesota.

Table 6. Corn yield and N recovery in the whole plant as influenced by time of application and N source at Waseca, 1997-1999.

<table>
<thead>
<tr>
<th>Nitrogen Management</th>
<th>3-Yr Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Source N-Serve Yield N Recovery</td>
<td>---------------</td>
</tr>
<tr>
<td>Fall Urea No 152 43</td>
<td>Urea, N-Serve, N Recovery</td>
</tr>
<tr>
<td>Fall Urea Yes 158 47</td>
<td>Urea, N-Serve, N Recovery</td>
</tr>
<tr>
<td>Fall An. Ammonia No 168 60</td>
<td>Urea, N-Serve, N Recovery</td>
</tr>
<tr>
<td>Fall An. Ammonia Yes 170 63</td>
<td>Urea, N-Serve, N Recovery</td>
</tr>
<tr>
<td>Spr. Preplant Urea No 185 76</td>
<td>Urea, N-Serve, N Recovery</td>
</tr>
<tr>
<td>Spr. Preplant An. Ammonia No 182 84</td>
<td>Urea, N-Serve, N Recovery</td>
</tr>
<tr>
<td>Spr. Preplant None -- 112 --</td>
<td>Urea, N-Serve, N Recovery</td>
</tr>
<tr>
<td>LSD (0.10): 8</td>
<td>Urea, N-Serve, N Recovery</td>
</tr>
</tbody>
</table>
Preplant-applied urea gave significantly greater continuous corn yields in a 3-yr study in southeastern Minnesota than did preplant-applied UAN (28%N). Yields for a split application of UAN were not significantly different from the preplant urea treatment. A 4-yr study in south-central Minnesota showed greatest corn yields following soybeans with preplant-applied urea (182 bu/A), followed by preplant and incorporated UAN (181 bu/A), and poorest yields with broadcast pre-emergence UAN (166 bu/A).

The results from the four above studies are not surprising and could have been predicted given the characteristics of the three primary sources of fertilizer N in Minnesota - - - anhydrous ammonia, urea, and UAN (a 50:50 blend of urea and ammonium nitrate). These three sources currently occupy 39, 50, and 11% respectively, of the fertilizer N used for crop production in Minnesota. Ammonium forms of N fertilizer such as anhydrous ammonia with a nitrification inhibitor should be used for fall applications. Urea and anhydrous ammonia (both ammonium forms) should be used for spring preplant applications to reduce the potential for early-season nitrate loss. Urea-ammonium nitrate (UAN) contains 25% nitrate, which is immediately susceptible to leaching, performs best when split applied or applied in-season. Under normal spring conditions anhydrous ammonia will take up to six weeks to nitrify from ammonium to nitrate while urea may take up to three to four weeks. This delay decreases the potential for leaching of nitrate during the last part of April and in May, when precipitation is greatest and crop demand for nitrogen and water is low.

**Method of Application – Placement**

Method of application or placement choices are generally not large contributing factors in the management of anhydrous ammonia or urea. Anhydrous ammonia is usually knifed into the soil about 7” deep. The only time AA placement becomes a decision factor is when sidedressing where the AA is usually knifed in between each of the rows but can be knifed in between every other row. The latter method is easy and requires less tractor horsepower. Yield comparisons show no difference between the two. Urea is usually broadcast on the soil surface and then incorporated with tillage. In some cases, urea is knifed in about 4” deep. Yield differences are generally not found between the two placement methods. UAN has myriad placement options ranging from broadcast on the soil surface with or without incorporation by tillage, to dribbling in bands on the soil surface, to being knifed in about 2-3” deep with preplant, pre-emergence, and sidedress application times or with a combination of split applications. Yield differences among placement systems show little consistency except that incorporation of UAN produces greater yields than UAN left on the soil surface and not incorporated. Dribbling UAN within 2” of the corn row at a rate of 20-30 lb N/A has also been quite effective.

Although not a specific application/placement method, incorporation of urea and UAN is generally recommended because of the possibility of volatilization losses of ammonium if rainfall does not occur within a few days of application. Broadcast application of urea for no-till corn is a problematic application method likely to result in ammonia volatilization especially under high urease conditions [high levels of surface residue and calcareous soils (pH>7.4)]. Urease inhibitors such as Agrotain and other products, reduce the potential of volatilization losses of N to the atmosphere. These products should be impregnated into the urea before broadcast application.
In other studies, sidedress application of urea and UAN at the V6 stage followed by cultivation a few days later resulted in corn yield reductions of 12 to 17 bu/A. These data suggest that the urea and UAN had not been incorporated sufficiently deep into moist soil to move down into the active root zone, thereby remaining positionally unavailable.

In summary, these data for southern Minnesota support the recommendation of incorporating or injecting broadcast or sidedress applications of urea or UAN into moist soil to a minimum depth of three inches.

Relative Effectiveness of Management Practices to Reduce Nitrate Losses

Various N and crop management systems can be employed to reduce the potential of nitrate loss from corn production systems to ground and surface (tile drainage) waters. The N management practices are commonly referred to as BMP’s (best management practices) - - - the ones discussed within the preceding portion of this document. The following discusses each of the management practices shown in Table 7 and their relative effectiveness at reducing nitrate losses. The estimates are based on my experience and professional judgment.

Nitrogen Management Practices

**Rate of N:** Of the five N management practices, rate of N application has the greatest potential for reducing nitrate losses. The data shown earlier in this document clearly shows the huge impact of fertilizer N rate on nitrate concentrations and losses in drainage and soil water. The wide range in effectiveness is related to the amount of excess N above the recommended rate, ranging from minimal effectiveness if the excess rate is small (10-20 lb N/A) to substantial if the applied excess N rate is large (>100 lb N/A). These large excess rates could occur from a combination of fertilizer N coupled with manure N including the buildup of labile soil N from high rates of past manure and fertilizer applications. Discontinuing the application of 20-50 lb of excess “insurance” N for corn would significantly reduce nitrate losses.

In looking to the future, it is important to continue N rate research studies to determine yield response, net return to fertilizer N, N recovery in the corn, residual soil nitrate in the profile of medium-textured soils of SE Minnesota, and nitrate concentration in soil water or tile drainage when growing new highly productive corn hybrids. These complete sets of production and environmental data will be relied upon and necessary to make improved N management decisions for the future in Minnesota. Research on remote sensing and in-season adaptive models may be helpful to provide diagnostic information to improve N rate decisions. It will be particularly useful to focus some studies on slightly less-than-recommended N rates for corn on highly productive soils to more clearly define the yield and economic effects/risk relative to the environmental effects/risk with this reduced N rate approach.

Another factor that clouds the optimum N rate picture is the high levels of labile organic N, which have accumulated in soils that have received long-term abundant to
excessive rates of manure or fertilizer N over the years. Because significant amounts of
the labile organic N can be mineralized into available N each year from these soils,
optimum fertilizer N rates could be rather small due to the large amounts of available
soil N, yet nitrate concentrations leached into ground and surface waters could be large.

**Time of N:** Time of N application also can have a significant impact on reducing nitrate
losses. This is particularly true if growers were to discontinue this application of extra
“insurance” N when fall applying their fertilizer. Growers have additional options, - - -
either add a nitrification inhibitor (NI) such as N-Serve to the recommended N rate and
fall apply after the soil temps remain below 50ºF or switch to spring or in-season
applications involving various N sources. The data shown throughout the earlier portion
of this document consistently show the corn yield and economic advantage to spring
application of N. Reductions in nitrate concentrations and losses are much smaller than
the large and consistent yield advantages for spring-applied N. The greater effect of
Time of Application for ground water under well-drained soils is the dominance of
leaching and absence of denitrification on these soils.

As fall application of N becomes less popul ar, especially on vulnerable soils, due
to economic and environmental risks and challenges, new Time of Application research
must consist of various spring and in-season application times coupled with various N
sources, placements, and inhibitors - - - both NI’s and UI’s. It is unlikely that these “new”
combinations of sources, placement, timing, and inhibitors/additives will show a large
advancement of reduced nitrate losses. But, it is important to identify combinations that
improve net economic return for the farmer and improve logistics for the retailer.

**Source of N:** In the big picture source of N has little effectiveness on reducing nitrate
losses. However, two examples stand out where N source plays a significant role: (1)
urea applied in the fall with or without a NI in south-central Minnesota. With this
treatment, corn yields are reduced, largely due to nitrate losses. (2) UAN applied in the
spring to well drained soils may be lost due to excessive spring rainfall, necessitating an
additional in-season application of N that leads to the total N rate exceeding the original
rate recommended.

**Method/Placement of N:** The method or placement of N generally has very little effect
on nitrate losses even though it may affect grain yield some. An exception could be the
broadcasting of urea or UAN without a urease inhibitor (UI) for no-till corn where surface
residues are abundant and/or soil pH is high. Significant volatilization of ammonium
could occur requiring a supplemental application of additional fertilizer, which would
bring the total N rate applied to exceed the recommended N rate.

**Inhibitors (NI & UI):** Nitrification inhibitors (NI) such as N-Serve and Instinct currently
play a role of improving the performance of fall-applied ammonia and hog manure.
Urease inhibitors (UI’s) such as Agrotain and Limus reduce volatilization losses of
ammonium fertilizers applied to the soil surface. Proper use of NI’s and UI’s allows
improved N management, which in turn often improves corn yield but the effect on
nitrate losses to water is yet unknown.
Table 7. Relative effectiveness of management practices to reduce nitrate losses to ground and surface waters in Minnesota

<table>
<thead>
<tr>
<th>Practice</th>
<th>Tile Drainage</th>
<th>Ground Water</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poorly drained</td>
<td>Well drained</td>
</tr>
<tr>
<td>Rate of N</td>
<td>L-H (10-60)*</td>
<td>L-H (10-70)*</td>
</tr>
<tr>
<td>Time of N</td>
<td>L (10-30)</td>
<td>M-H (30-80)</td>
</tr>
<tr>
<td>Source of N</td>
<td>VL (0-10)</td>
<td>VL (0-10)</td>
</tr>
<tr>
<td>Method/Placement</td>
<td>VL (0-10)</td>
<td>VL (0-10)</td>
</tr>
<tr>
<td>Inhibitors (NI &amp; UI)</td>
<td>L (10-20)</td>
<td>L (10-20)</td>
</tr>
<tr>
<td>Fall tillage</td>
<td>VL (0-10)</td>
<td>VL (0-10)</td>
</tr>
<tr>
<td>Cover crops</td>
<td>L (0-30)</td>
<td>L (0-30)</td>
</tr>
<tr>
<td>Cropping system</td>
<td>VH (100)</td>
<td>VH (100)</td>
</tr>
</tbody>
</table>

* = Effectiveness (0 = VL to 100 = VH)

Crop Management Practices

**Fall tillage:** A 11-yr study was conducted at Waseca comparing no tillage with moldboard plowing for continuous corn. Moldboard plowing produced higher corn yields and slightly higher nitrate concentrations in the tile drainage but lower drainage volume. No tillage produced lower corn yields and slightly lower nitrate concentrations but greater drainage volume. Thus, nitrate loads (drainage volume X nitrate concentration) were not different between the two tillage extremes. This study conducted where soils are frozen from December through March produced data much different than are found in warm climates, where fall tillage stimulates nitrification of soil organic matter and hence greater nitrate concentrations and losses.

**Cover crops:** Cover crops are getting much notoriety in the U.S. for their ability to take up residual N remaining in the soil after corn. The cover crops (mainly cereal rye plus a host of other crops) are established in the fall for nitrate uptake in the fall, winter in some cases, and the spring before the next crop is planted. These cover crops perform well at more southern latitudes (below I 80) where fall establishment is successful. This is not the case in Minnesota where the window for establishment in the fall between corn harvest and fall freezing is small. Successful establishment occurs when the cover crops can be planted rather early, when soils are warm, when soil moisture is plentiful, and when the first fall frost is delayed. Additionally, the window in the spring for uptake of nitrate is often quite short between warm temps for uptake and planting of the next crop. A 3-yr study at Lamberton for soybean following corn showed excellent cover crop growth in one year (both fall and following spring) with superb uptake of nitrate. In another year, establishment of the cover crop was not possible due to the cold fall. In the third year, the crop was adequately established but further growth and N uptake was marginal at best. Examination of the 3-yr results and the 40-yr fall weather history at Lamberton led the scientists to predict that cover crops in a corn-soybean rotation would work well in 1 of 4 years in southern Minnesota. Cover crops can work extremely well in Minnesota if planted by September 1 when following sweet corn, peas, small grains, and corn removed for silage. Additional research on adopting cover crops for a corn-
soybean rotation in Minnesota is needed. Developing or selecting species that can germinate and then tolerate dense corn growth, limiting light in August and early September, is needed. Establishing a cover crop in mid-June and getting it to live within the dense and shaded conditions from mid-July until early September would be ideal. Also, out-of-the-box research such as planting a high yielding corn hybrid that has a low biomass characteristic at various reduced populations to provide sufficient light for growth of cover crops seeded in mid-June would be valuable. Depending on corn grain yield, N rate, net economic return, and cover crop sustainability, growth and N uptake, this could be an alternative to simply reducing or shifting X amount of corn acres to another non-N demanding crop to achieve meeting the goals of the N Reduction Strategy.

Cropping Systems: Cropping system really is the primary factor that controls the input of nitrogen, the management of nitrogen, and nitrate losses to ground and surface water systems. Corn-based production systems, whether they are continuous corn, a C-C-soybean rotation, or a simple C-S rotation all require large input loads of fertilizer N. To determine the influence of cropping system on drainage volume, nitrate concentration, and nitrate loss in tile drainage, a 6-year study (1988-93) was established at Lamberton, MN. Drainage occurred in 1990-93, and the results are shown in Table 8. Based on these seminal, well cited data, it is fair to say that cropping system has a greater effect on hydrology and nitrate losses than any other management practice. The perennial crops [alfalfa and Conservation Reserve Program plants (brome grass, orchard grass, timothy and alfalfa)] reduced drainage volume by 25 to 50% due to greater transpiration and reduced nitrate loses by >95%. Thus, shifting some of Minnesota’s approximately 8 million acres of corn to other crops requiring substantially less to no nitrogen would likely reduce nitrate losses more than implementing all of the previous nitrogen BMP’s and crop management practices discussed earlier.

Rather than simply shifting one or two million acres to another non-N demanding crop, it may be wise to encourage crop rotation research involving a year or two of alfalfa such as a C-S-C-A-A rotation or perhaps other crops to determine their efficacy at reducing nitrate losses to ground and surface water systems while optimizing net return. Because alfalfa requires different seeding and harvesting machinery and storage facilities than row crops, perhaps “neighbor” farmers could be incentivized to fulfill the alfalfa needs of the system. This may have merit especially in vulnerable soils within areas of “high dairy cattle numbers”.

Table 8. Effect of cropping system on drainage volume. NO$_3$-N concentration, and N loss in subsurface tile drainage during a 4-yr period (1990-93) in MN.

<table>
<thead>
<tr>
<th>Cropping System</th>
<th>Total discharge</th>
<th>Nitrate-N Concentration</th>
<th>Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inches</td>
<td>mg/L</td>
<td>lb/A</td>
</tr>
<tr>
<td>Continuous corn</td>
<td>30.4</td>
<td>28</td>
<td>194</td>
</tr>
<tr>
<td>Corn – soybean</td>
<td>35.5</td>
<td>23</td>
<td>182</td>
</tr>
<tr>
<td>Soybean – corn</td>
<td>35.4</td>
<td>22</td>
<td>180</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>16.4</td>
<td>1.6</td>
<td>6</td>
</tr>
<tr>
<td>CRP</td>
<td>25.2</td>
<td>0.7</td>
<td>4</td>
</tr>
</tbody>
</table>
Emerging 4R Practices Water Quality Research

In the October, 2015 issue of the Journal of Environmental Quality, a Technical Report was published by L.E. Christianson (U of Illinois) and R.D. Harmel (Texas A & M) entitled “4R Water Quality Impacts: An assessment and synthesis of forty years of drainage nitrogen losses”. They reviewed and quantitatively analyzed nearly 1000 site-years of subsurface tile drainage N load data to develop a more comprehensive understanding of the impacts of 4R practices (application of the right source of nutrients, at the right rate and time, and in the right places) within drained landscapes across North America.

They concluded that some of the 4R practices for reducing nitrate-N loads were stronger than others.

- Optimizing N rate was important and will continue to receive primary research and regulatory focus.
- The lack of significant difference between N application timing or application methods (placement and source) was inconsistent with the current emphasis placed on timing as a WQ improvement strategy.
  - Application timing analysis were complicated by differences in application rates between timing treatments; highest application rates resulted in greatest N losses.

Editorial Comment

Will the 4R approach be successful in reducing nitrate-N losses to surface and ground water to meet the goals of Nitrogen Loss Reduction Strategies being established?

My answers are:

1) They are directionally correct and helpful but will not accomplish the goal by themselves.

2) Universal commitment will be needed within the agricultural community (ag advisers, retailers, consultants, commodity groups, agricultural interest groups, etc.) to advance the 4R concept consistently and quickly.

3) Shifting acreage away from corn to other cropping systems is the most effective strategy as it decreases N inputs to the landscape and significantly reduces N losses to ground and surface water.
References


EXHIBIT 3
Manure Application Acres Proposed at Daley Farms & Drinking Water Supply Management Area Vulnerability

Site
- Daley Farm Site

Manure Acres
- Daley Farms Proposed Application Acres

Map produced by Andrea Mathews at MCEA on October 29, 2018. Map data sources include feedlots from the MN Pollution Control Agency, wellhead protection areas and drinking water supply management area (DWSMA) vulnerability from the MN Department of Health, and basemap aerial imagery from MNCEO with distance buffers from Daley Farms proposed site, and application acres digitized from the EAW for Daley Farms (2018) at a scale of 1:10k in ArcGIS Desktop (v10.5). Map produced in ArcMAP, v10.5, ESRI 2017. This map is meant for illustrative purposes only. MCEA is not responsible for any inaccuracies herein contained.
EXHIBIT 4
An Analysis of the Impact of Swine CAFOs on the Value of Nearby Houses

By

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July 23, 2008

ABSTRACT

The impact of 39 swine confined or concentrated animal feeding operations (CAFOs) in Black Hawk County, Iowa on 5,822 house sales is explored by introducing a new variable that more accurately captures the effects of prevailing winds, exploring potential adverse effects within concentric circles around each CAFO, managing selection bias, and incorporating spatial correlation into the error term of the empirical model. Large adverse impacts suffered by houses that are within 3 miles and directly downwind from a CAFO are found. Beyond three miles, CAFOs have a generally decreasing adverse impact on house prices as distance to the CAFO increases.

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Keywords: LULUs, swine CAFOs, house values, externalities, spatial correlation, hedonic analysis, maximum likelihood, concentric circles, prevailing winds, selection bias.

JEL Codes: Q51, Q53, R21
An Analysis of the Impact of Swine CAFOs on the Value of Nearby Houses

Introduction

Swine confined or concentrated animal feeding operations (CAFOs) can be and often are considered to be locally undesirable land uses (LULUs). Unpleasant odors and ground water contamination tend to be the greatest concerns of those who live near swine CAFOs. This situation has intensified since passage of the federal Pork Production, Research and Consumer Education Act (PPRCEA) in 1985, which lead to a significant increase in pork production. PPRCEA funded research into more efficient production techniques, especially CAFOs. During the late 1980s and early 1990s, two powerful influences, (1) PPRCEA funded advertising (pork, the other white meat) and (2) health concerns regarding the consumption of red meat, fueled a tremendous increase in the consumption and production of pork. Much of this increased production has been concentrated in a few, historically traditional, pork-producing states, particularly Iowa, North Carolina, Minnesota, and Illinois. As a result, nuisance complaints from those living near pork production sites, especially CAFOs, have increased. Lasley (1998) reports considerable concern with hog odors among rural Iowa residents. Van Keek and Bulley (1995) report that 95% of the nuisance attributed to farm odors can be traced back to swine CAFOs. In Iowa, some rural residences have sued nearby swine CAFOs as nuisances, and public hearings to consider new swine CAFO permits are overflowing with protesters.
The impact of proximity to swine CAFOs on housing values is a topic worthy of attention. To whatever extent swine CAFOs are the source of a negative externality deserves to be rigorously addressed, because the fears that the value of nearby homes might diminish could easily be exaggerated or overstated. Others have investigated this issue using proximity to a LULU to measure impact, implicitly assuming that any adverse effect will diminish with increasing distance from the source. However, relying solely on proximity as a measure of intensity can be problematic, because selection bias might distort the results. That is, the impact observed might be due to LULUs locating near low-valued houses. Therefore, additional measures of intensity and techniques to manage selection bias are desirable.

Spatial correlation abounds in housing sales data (Basu and Thibodeau, 1998; Isakson and Ecker, 2001; Case, Clapp, Dubin and Rodriquez, 2004) whereby two similar homes sell for a more similar price if they are closer geographically, than two homes farther apart. Omitted spatial variables and clustering of similarly priced homes are two sources of spatial correlation that, if omitted, will bias ordinary least squares (OLS) parameter estimates.

This study reviews previous studies of CAFOs, develops a spatial model for estimating the adverse affect associated with proximity to CAFOs, and applies this model to housing sales in a representative Iowa county. In particular, this study expands the approach taken in previous studies by (1) introducing a new variable that more accurately captures the effects of prevailing winds, (2) exploring potential adverse effects within concentric
circles around each CAFO, (3) managing selection bias, and (4) incorporating spatial correlation into the error term of the empirical model.

The organization of the paper is as follows: section 2 contains a review of the literature while the housing sales data and CAFO variables are examined in section 3. The statistical model is developed in section 4 while the results and findings are reported in section 5. The final section includes a discussion of the findings and suggests directions for further research.

Review of the Literature

Studies of the effects of a locally undesirable land use (LULU) on nearby housing values are abundant in the literature. In a meta-analysis, Simons and Saginor (2006) review 58 articles that study the impact on nearby property values of numerous LULUs, such as power lines, landfills, nuclear power plants, sex offenders, air pollution sources, and leaking underground storage tanks. They report that the adverse effect of a LULU diminishes with distance from the source.

In the earliest of the published studies of swine CAFOs, Palmquist, Roka, and Vukina (1997) examine 237 rural house sales in nine southeastern North Carolina counties, which occurred between January 1992 and July 1993. Unfortunately, due to privacy and confidentiality rules in North Carolina, the authors have no specific data for the locations of the CAFOs. Instead, they made use of data provided to them by the State Veterinarian’s Office consisting of the total number of herds and capacity of swine
CAFOs within three bands (0-1/2 mile, ½-1 mile, and 1-2 miles) around each of the 237 sales. From the CAFO data, the authors construct a manure index, based on the type and number of animals at the CAFO to estimate the weight of manure produced within each of the three bands. Using nonlinear least squares, they estimate that the effect of proximity is up to negative 9% of the value of a house, depending on the amount of manure produced by the CAFO.

In the second published study, Herriges, Secchi, and Babcock (2003) examine 1,145 house sales that occurred between 1992 and 2000 in five Iowa counties for the effects of proximity to 550 livestock facilities. By including more years (8) and a larger geographical area (five counties) in their analysis, these authors have many more sales and CAFOs than previous studies. The five Iowa counties selected for study include some of the highest concentration of CAFOs in the state. The authors make use of several measures of the effects of a CAFO, including distance to the nearest CAFO, the number of CAFOs within three miles of a house, the size (live animal weight) of the CAFO, a manure index, and whether the house is downwind from the nearest CAFO in warmer and colder months. Very few of these CAFO variables are statistically significant. Proximity to the nearest CAFO in the colder months for houses downwind from a CAFO shows a statistically significant loss in value depending on the size of the CAFO (their prevailing wind variable is a binary (0,1) measure). The strongest adverse effect reported is proximity to smaller CAFOs with a price-with-respect-to-distance elasticity of 0.097 during the winter and 0.112 during the summer months. Interestingly, the larger CAFOs show a smaller negative impact associated with proximity than smaller
CAFOs. The authors suggest that one reason for this effect is the ability of the larger CAFOs to afford the costs of odor abatement techniques. Unfortunately, the Herriges, Secchi, and Babcock study does not estimate the effect of proximity separately from the size of a CAFO. Instead, they include interaction terms (log size times the log proximity; and the log size times the number of nearby CAFOs) without including the main effects, i.e., they do not allow for the potential for main effects alone being statistically significant by only checking if the interaction is important.

Others have also studied swine CAFOs. For example, Taff, Tiffany, and Weisberg (1996) in an unpublished paper examine 292 sales of rural, residential properties in two Minnesota counties that occurred from 1993 to 1994. These authors measure proximity to CAFOs using a series of three, one-mile rings around each sale. They also attempt to control for the size of the CAFO, wind direction, and number of CAFOs within three miles of a sale. In contrast to Palmquist, Roka, and Vukina, the authors report a positive effect associated with proximity to CAFOs. That is, houses closer to the CAFOs are reported as selling for more than those located further away, after controlling for other factors that traditionally affect housing values.

In another unpublished study, Hamed, Johnson, and Miller (1999) examine the sales of 99 rural parcels (39 with houses) in Saline County, Missouri that occurred between January 1, 1996 and December 31, 1997 for effects of proximity to CAFOs. The authors use a linear measure of distance to the nearest CAFO and find a loss of $112 per acre of land with houses and no impact on vacant land within three miles of a CAFO. In yet
another unpublished study, Abeles-Alison and Connor (1990) examine housing sales surrounding eight swine CAFOs in Michigan that received multiple odor complaints during the first nine months of 1989. The primary purpose of their study is to estimate the impact on property tax revenues due to the presence of a CAFO in a township. The authors’ analysis of 288 housing sales reveals that houses within 1.6 miles of a CAFO suffer a decline in value of $1.74 per animal in the CAFO. This impact is found to decrease with increasing distance from the CAFO.

The literature suggests that swine CAFOs can be a significant negative externality. Unfortunately, all previous studies suffer from at least one of the following: the lack of data on location/intensity at the CAFO level; small sample sizes; the lack of ability to detect any effect due to wind; a model that does not account for spatially correlated data; and the lack of management of selection bias. This study uses measures of location and intensity both at the CAFO level and at the individual house level, includes a new cardinal, wind angle variable, uses larger sample sizes, manages selection bias, and incorporates a spatial correlation component into the model.

Data

This study combines two primary sources of data: (1) housing sales data and (2) swine CAFO data. The housing sales data consists of 5822 single-family sales in Black Hawk County, Iowa. The number of sales in this dataset far exceeds the number of sales used in all of the previous studies. The sales data initially contained every transaction in the county from January 2000 to November 2004. These sales were refined by selecting only
those transactions identified as “arms length transactions” by the county tax assessor’s office. The sales were further refined by selecting only those sales with a selling price greater than $32,000 or less than $400,000, houses with at least three but less than 12 rooms, at least 500 square feet of living area, and a lot size greater than 3,000 square feet. In addition, due to limitations of the spatial model in this study, only the most recent sale, for any repeat sales, was used.

The housing sales data includes information on the following variables for each sale: date of sale, state-plane coordinates of the centroid of the property, municipal jurisdiction, year built, lot size, living area, and number of rooms. In addition to these variables, each sale includes calculations of the distance to selected points of influence; the CBDs of the two largest cities (Cedar Falls and Waterloo), the largest employer in the county (John Deere), and a large university (The University of Northern Iowa).

Information regarding CAFOs is difficult to obtain. CAFO owners are very reluctant to volunteer any data to researchers, because they fear that the information they disclose may be used against them. Thus, researchers are forced to use public records as their source of information. For each of the 39 swine CAFO sites in the county, information is obtained from the Iowa Department of Natural Resources (IDNR) on the following: state-plane coordinates of the centroid of the site, number of animal units permitted, and planned manure management techniques (method of applying manure to fields). Animal units represent a weighted sum that reflects the number and size of the animals permitted, whereby one animal unit is defined as one head of feeder cattle. Swine that weigh more
than 55 pounds count as 0.4 animal units, while swine that weigh between 15 and 55 pounds count as 0.1 animal units. Animals less than 15 pounds are not counted. The manure management techniques are planned rather than actual, because the state only requires CAFO owners to report their planned, rather than their actual manure management techniques, and unfortunately, the Iowa DNR does not monitor compliance with CAFO manure management plans. Data regarding manure storage facilities and operational types are not included in this study, because this type of data is difficult to obtain, unverified, and often unreliable.

One of the major contributions of this study is the introduction of a non-linear, cardinal variable called wind angle that measures the extent to which a house is downwind from a nearby CAFO; see Figure 2. Prevailing winds data during the study period obtained online from the National Climatic Data Center is used to determine the prevailing (most frequent) wind directions, which are from the northwest in the colder months (135 degrees from the X-axis) and from the south-southeast in the warmer months (300 degrees from the X-axis). The variable wind angle is defined as zero for all homes upwind of the CAFO, because one would anticipate no (additional) wind effect for homes in a 180 degree field upwind from the nearest CAFO. Wind angle is 90 for houses directly downwind from the nearest CAFO. One would anticipate that the more directly downwind from a CAFO a particular house is (at a fixed distance from the CAFO), the greater the intensity of any airborne pollutants, such as obnoxious odors. This wind effect may play an even stronger role in affecting home prices than just proximity to the confinement building when the source of the odor is a large area of land, such as the
fields in the immediate vicinity of the CAFO where manure has been applied. The model also includes a seasonal binary variable indicating warmer or colder months based on the date of sale, and a binary variable that identifies on which side (north or south) of the prevailing winds the house is located. Lastly, a wind angle–season interaction variable is included to account for potential seasonality of the prevailing winds, i.e., to distinguish being downwind in the warmer versus the colder months.

The problem of selection bias in the data deserves attention. Selection bias can result when CAFOs and lower priced homes are clustered or concentrated in the same geographic area of the county, i.e. the low land prices attract CAFO owners as well as home buyers looking for inexpensive homes. One way to explore for selection bias is to examine house sales just before and right after a CAFO is opened and operating. This sort of event study is rarely performed and, moreover, establishing causality is extremely difficult since the observed price change could be due to the new CAFO or due to some other event. None of the previous studies of swine CAFOs make a direct attempt to manage selection bias, although Herriges, Secchi, and Babcock do so unintentionally by including the number of CAFOs within close proximity (three miles) of each sale. Munneke and Slawson (1999) manage selection bias in their study of mobile home parks by using a two-stage, random-effect, correction variable derived from a PROBIT analysis. Unlike covariates in standard (hedonic) regression models, their correction variable is not a fixed-effect; it has variability (sampling distribution/error) that is not accounted for in their final model. In the present study, selection bias is managed primarily by including a fixed-effect variable directly into the mean structure of the
model to capture the extent of CAFO clustering (rather than a two-stage approach). If CAFO owners locate their operations near low valued houses, then one should observe clusters of CAFOs in very close proximity to low valued houses. Therefore, this study includes, for each sale, the count or number of CAFOs within a very close (1.5 mile) distance of each sale. If selection bias were present, then one should find more CAFOs located near lower valued houses (than located near higher-valued houses), i.e., the count variable will be statistically significant and negative. In addition to this count variable, this study also manages selection bias within an error term that accounts for spatial correlation, as seen in the next section.

Table 1 contains summary statistics of the 5822 sales and 39 CAFOs. Figure 2 contains a map of the locations of the sales, CAFO sites as well as the municipal boundaries of the major cities in the county. Most of the sales occur within the jurisdictional boundaries of five incorporated cities, while 254 of these sales occur within the unincorporated (rural) areas of the county. On average, houses in the dataset are four miles from the nearest CAFO, and one out of forty (146/5822) houses has a CAFO located within 1.5 miles. The wind angle varies from zero to 90, with an average of 33.95, and about 20 percent of the sales occurred during one of the colder months.

The 39 CAFOs are permitted for an average of 977.5 animal units and range in size from 156 to 2005 animal units. About one-fourth of them (11/39) indicate that they plan to apply manure to fields in the vicinity of the confinement building using the older,
traditional broadcast method. The rest intend to use newer methods, such as injection or knife methods.

**Statistical Models and Methodology**

This study starts with a hedonic regression model of house price that includes independent variables to control for factors that traditionally influence house prices, including size and age of the dwelling, as well as, a set of variables that can capture the potential adverse effects of proximity to a CAFO. Specifically, let,

\[ P = \text{the selling price of the house}, \]
\[ S = \text{lot size in acres}, \]
\[ t = \text{the time of the sale}, \]
\[ C = \text{a vector of site level characteristics of the house that typically affects selling price}, \]
\[ L = \text{a vector of site level spatial measures of proximity to other points of influence}, \]
\[ J = \text{a vector of binary variables representing the jurisdiction in which the house is located} \]
\[ D = \text{the distance to the nearest CAFO}, \]
\[ AU = \text{the number of animal units permitted at the CAFO}, \]
\[ CT = \text{the number of CAFOs within 1.5 miles of the home}, \]
\[ PW = \text{the degree (0 to 90) that the house is downwind from the nearest CAFO}, \]
\[ WS = \text{a binary variable representing the season (0 = summer; 1 = winter)}, \] and
\[ PWS = PW * WS, \text{a wind direction – season interaction variable}. \]

then the selling price of a house can be expressed as,

\[ P = \kappa S^\rho AU^\pi e^{\gamma D + \phi + \psi C + \lambda L + \tau J + \alpha CT + \beta PW + \delta WS + \lambda PWS + \epsilon} \tag{1} \]

where the Greek letters represent parameters of the model to be estimated from the data. The site specific variables in \( C \) include living area, the number of rooms in the house and the year the house was built. The spatial variables in \( L \) include the distance to the CBD of two large cities (Waterloo and Cedar Falls) and distances to the two largest employers.
in the county (John Deere and the University of Northern Iowa) that dominate the labor markets in the county. This model includes independent variables to capture any adverse effect of CAFOs, including the size, wind-angle, and distance to the nearest CAFO.

We fit the hedonic model, equation (1), using a concentric circles statistical modeling approach, in which seven hedonic regression models are fitted for all sales that have a CAFO within 2, 2.5, 3, 3.5, 4, 4.5, and 5 miles of the house. An eighth hedonic regression model is fitted using all 5822 sales. Obviously, the results of the two mile hedonic regression analysis, with \( n_1 = 309 \) sales, will have an impact upon the results of the 2.5 miles analysis, with \( n_1 + n_2 = 507 \) sales, due to the common \( n_1 = 309 \) sales. However, we choose the concentric circles analysis over a ring analysis (of solely the \( n_2 = 198 \) sales between 2 and 2.5 miles from the nearest CAFO) because the concentric circles analysis provides a more continuous and smooth look at how proximity to a CAFO affects selling prices, i.e., we explore how the independent variables change in both interpretation and statistical significance with proximity to the nearest CAFO. Ring analysis often results in a smaller sample size, produces much more variable results and is beset with highly influential sales. These effects can be smoothed out using concentric circles.

In addition, we include a spatial correlation component in the hedonic regression model, equation (1), by modeling the error term, \( \varepsilon \), in a geostatistical manner (see Cressie (1993); Isakson and Ecker (2001); and Ecker (2003)), in lieu of the traditional OLS error term. Spatial correlation implies that, all things otherwise equal, two homes will sell for
a much more similar price if they are closer geographically, compared to two otherwise
similar homes much farther apart. Specifically, we model

$$\ln(\epsilon) \sim N(0, \tau^2 + \sigma^2),$$  \hspace{1cm} (2)

where \( \tau^2 \) is referred to as the “nugget” effect (a measurement error or micro-scale
variability) in the geostatistical literature. The sum of the parameters \( \tau^2 + \sigma^2 \) in (2)
represents the spatial variability of the spatial process or “sill”, i.e., the variability of the
home prices after adjusting for individual home characteristics. Lastly, for two home
sales with errors \( \epsilon_i \) and \( \epsilon_j \), we model the spatial correlation as a function of their
Euclidean distance apart, \( d_{ij} \). Specifically,

$$\text{Corr}(\ln(\epsilon_i), \ln(\epsilon_j)) = \exp(-\phi d_{ij})$$  \hspace{1cm} (3)

where \( \phi \) controls the strength of the spatial correlation and is called the “range”
parameter. The range indicates the distance beyond which home prices are (essentially)
uncorrelated. Spatial correlation models, (2) and (3), are random effects models designed
to “mop up” extra variability not captured in the mean structure in equation (1). In
particular, unobserved variables and any selection bias not fully captured by the count of
CAFOs within 1.5 miles of the home sale are managed by adding spatial correlation
components, (2) and (3), to the model.

The spatial correlation parameters, the range, sill and nugget in (2) and (3), along with the
site level mean structure parameters in (1), are estimated simultaneously, within each
concentric circle, using a maximum-likelihood, iterative fitting technique.\(^3\) Reasonable
starting or seed values of the spatial correlation parameters are needed to ensure timely
and accurate convergence of the fitting algorithm. These starting values for the range, sill
and nugget for each concentric circle are obtained by fitting an exponential theoretical variogram model to an empirical variogram constructed from the residuals of an ordinary least squares (a non-spatial correlation) hedonic regression model.\(^4\)

**Results and Findings**

The results of the eight, maximum-likelihood regressions are reported in Table 2 where the Goodness of Fit statistics indicates that as one adds more data in the larger diameter concentric circles, the model fits better. All of the house specific or structure variables have coefficients that are highly statistically significant, of reasonable magnitude and sign, and are very stable from one concentric circle to the next. Of the time variables, the date of sale is statistically important in all concentric circles, while the season variable is only important in the 4 mile concentric circle (in which, homes sold in warmer months sell for more that those sold in colder months). The date of sale coefficient shows lower rates of annual appreciation (3.7\%) for those sales that are close to a CAFO. In the larger concentric circles, the annual rates of appreciation are higher (about 5\%).

None of the distance variables are statistically significant in any concentric circle. It is not surprising that the CBDs of both cities are not strong points of influence, since they are not a major destination point for county residents. The employment and retail sites within the county are well disbursed, rather than concentrated at any particular point.

Very few of the city binary variables are statistically significant. Within the smaller concentric circles, no sales are present in some of the cities. Where the city variables
have statistically significant coefficients, these coefficients suggest that houses sell for more within the two major cities. Higher house values within a city, as opposed to a rural area, are not a surprise.

The coefficients of the spatial correlation variables are fairly stable for all concentric circles except for the range parameter in the smallest concentric circle. This range coefficient suggests that the spatial correlations diminish rapidly beyond about two thirds of a mile ($0.35 \times 3500$ feet). The nugget value is consistently about 0.02 and represents about 40% of the total variability. Thus for parcels located within about two thirds of a mile from each other, OLS techniques would unnecessarily use the entire sill for explanation and prediction, i.e. the covariance for closer parcels is as much as 60% less than the total variability.

The pattern of statistical significance and insignificance for the CAFO variables reveals considerable insight into which characteristics of a CAFO most adversely affect nearby house values. The count variable, minimum distance and the manure application variables are all statistically not significant. Thus, there appears to be no evidence for selection bias, nor are houses affected by the planned method of manure management. (The actual method, if it were known, could be more important than the planned method of manure management.) The lack of significance for the distance variable indicates that just being close to a CAFO, all by itself, does not greatly affect house prices (more than wind-angle or size of the CAFO, as seen below).
The CAFO variables animal units and wind angle exhibit statistical significance within several of the concentric circles. For a house located at 3 miles or closer to a CAFO, how much the house is directly downwind from a CAFO is the most important (most statistically significant) CAFO variable. Beyond 3 miles, the size of the nearest CAFO in animal units is the only statistically significant CAFO coefficient. For houses that are five miles or more from the nearest CAFO, those that are north of being directly downwind from a CAFO sell for more than those that are south.

The CAFO coefficients from the concentric circle analysis paint a picture showing that the prevailing winds play a much more important role for houses within three miles of a CAFO, while the size of the nearest CAFO plays a more important role in influencing home prices for houses that are further away. Note that the sign and magnitude of the animal unit coefficient for very close sales (within 2 and 2.5 miles) is consistent with the signs and magnitudes in the larger concentric circles. Thus, lack of significance for animal units at close distances might be attributed to the relatively few sales in the smaller circles. Lastly, the wind angle – season interaction is not significant for any concentric circle, suggesting that the effect of being downwind from a CAFO in the warmer months is no different than in the colder months. In the smaller three concentric circles (2, 2.5 and 3 miles), wind angle is a more powerful (more statistically significant) explanatory variable than any of the other CAFO variables. Houses directly downwind and within two miles of a CAFO can suffer as much as a 44.1 percent loss in value (but, only one house is essentially (89.1 degrees) directly downwind and within 2 miles of a CAFO; the rest are no more than 60 degrees downwind). At the average wind-angle
(33.95 degrees), the loss in value for houses within two miles of a CAFO is slightly over 16.6 percent. If a house is within 2.5 miles of a CAFO, the maximum loss in value is 15.3 percent, while at the average wind-angle, the loss is 5.8 percent. Houses directly downwind within three miles of a CAFO (holding CAFO size constant) suffer a maximum loss in value of 9.9 percent, while at the average wind angle they suffer a 3.7 percent loss in value. Beyond three miles, wind-angle is not as important (statistically significant) as the size of the CAFO. Within three miles of a CAFO, the elasticity of house price with respect to CAFO size (measured in animal units) is -0.1370, which on average, suggests about a 6.85 percent loss in value for a 50 percent increase in CAFO size. For all sales, the elasticity of house price with respect to CAFO size is -0.0668, which on average, suggests about a 3.34 percent loss in value for a 50 percent increase in CAFO size.

Analysis of the sales data indicates that houses within very close proximity (3 miles or closer) to a CAFO can suffer a substantial loss in value, especially if the house is directly downwind from a CAFO. Further away from a CAFO (beyond three miles), houses suffer diminishing adverse effects as one moves further away from the CAFO. Generally, the rate of appreciation in house values is higher for houses further away from a CAFO.

**Summary and Conclusions**

This study improves our understanding of how and to what extent swine confined animal feeding operations (CAFOs) impact the value of nearby houses by (1) using concentric circles to increase sample sizes, (2) introducing a new variable that captures the effects of
prevailing winds, (3) using a model that accounts for spatially correlated data, and (4) managing the problem of selection bias. The study finds large adverse impacts suffered by houses that are very close (within 3 miles) to and directly downwind from a CAFO. Beyond three miles, CAFOs have an adverse impact on house prices, but this impact, in generally, diminishes with increasing distance from a CAFO.

This study also separates the effects of proximity, size, and prevailing winds, demonstrating for the first time that prevailing winds play a dominant role for houses within 3 miles of a CAFO, while size (animal units) plays a dominate role for houses beyond 3 miles from a CAFO. Additionally, this study finds that the impact of swine CAFOs is farther reaching than previous studies report; CAFOs can reduce the value of houses, albeit by a small amount, as far as six miles away.

Additional research remains to be done. In particular, the impact on houses located very close (within two miles) to a CAFO is extremely difficult to determine, because so little data are available. In fact, the impact could be so dramatic on these very close houses that they do not sell, due to the lack of willing buyers and/or the owner refusing to accept an offer that is a fraction of what its house specific variables would otherwise suggest. In addition, a comparison of the total loss in house values to the cost of odor abatement is also worth study. It might be less expensive for CAFO owners to compensate home owners for their loss than to implement odor abatement techniques. If transaction costs are sufficiently low, assigning tradable externality-free rights to homeowners or
externality-creation rights to CAFO owners represent market-based solutions that could be implemented to help mitigate the negative impacts associated with swine CAFOs.

Finally, the techniques developed in this study can easily be adopted by others who also study the impact of a particular land use on the value of nearby properties. The management of selection bias will always improve the results. Building spatial correlation into the error term will also help reduce biases in the estimates of the coefficients. The concentric circles technique can help deal with the problem of small sample sizes and influential observations. The wind angle measure introduced in this study could be adopted by others who study the impact of any sort of phenomenon that is carried and influenced by prevailing winds.

References


National Climatic Data Center, National Oceanic and Atmospheric Administration, Asheville, NC.


Acknowledgements

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**Figure 1** Definition of Wind Angle Variable

Warmer Months: March 22 to December 2 – SSE Predominate Wind Direction:

Colder Months: December 1 to March 21 – NW Predominate Wind Direction
Figure 2  Locations of Sales, CAFOs, and City Boundaries
Table 1  Summary Statistics of Data

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NOTES:

a. Sales Price is measured in dollars
b. Living Area is measured in square feet
c. N. Rooms represents the number of rooms in the house
d. Lot Size is measured in acres
e. Date of Sale is measured in years beginning at Jan. 1, 2000
f. Season = 1 for colder months (Dec. 1 thru March 21); 0 for warmer months
g. City variables are bi-variant (0,1)
h. Distance to variables are measured in miles to the center of each destination
i. Count measures the number of CAFOs within 1.5 miles of the house
j. Distance represents the distance to the nearest CAFO
k. Wind Angle represents the extent to which a house is downwind from the nearest CAFO
l. North = 1 for sales north of being downwind from the nearest CAFO; 0 if south
m. Manure App = 1 for broadcast; 0 otherwise (injection, etc.)
### Table 2: Maximum Likelihood Coefficients and p-values (statistically significant values, at the 0.1 level, are in **bold**)

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Table 2 Maximum Likelihood Coefficients and p-values (continued)

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Endnotes

1 The authors thank the Black Hawk County Board of Supervisors for providing the house sales data used in this study. The opinions expressed in this paper should not be interpreted as representing the opinions of the Black Hawk County Board of Supervisors.

2 The effects of proximity to the second, third, etc. closest CAFO are not addressed in this study.

3 Specifically, the PROC MIXED procedure in SAS is used to fit all of the models.

4 Specifically, S-Plus is used to derive the seed values for the range, sill, and nugget in each model.
Minnesota Pollution Control Agency

Daley Farms of Lewiston, LLP – 2018 Dairy Expansion

RESPONSES TO COMMENTS ON THE EAW AND INDIVIDUAL NPDES FEEDLOT PERMIT

The Minnesota Pollution Control Agency (MPCA) received a number of comments on the Environmental Assessment Worksheet (EAW) and State of Minnesota Individual Animal Feedlot National Pollution Discharge Elimination System (NPDES) Permit MN0067652 (Individual NPDES Feedlot Permit). See Appendix A for the complete list. In this Appendix, the MPCA responds to comments, grouped by themes. For additional information on how the comments were grouped, please contact the MPCA.

OVERALL PROJECT COMMENTS


Response: The comments are noted.


Response: The comments are noted.

Response: The MPCA Commissioner, following the criteria in Minn. R. 4410.1700, subp. 7, will determine the need for an EIS after carefully reviewing all information in the EAW and in the public comments. The MPCA Commissioner will develop Findings of Fact and Conclusions of Law to support either a positive declaration on the need for an EIS, or a negative declaration on the need for an EIS.

Comment 1-4: Commenters request the MPCA deny or reject the Project. (1, 8, 13, 33, 68, 99, 160, 258, 259, 263, 286, 289, 294, 296, 297, 299, 300, 303, 304, 305, 311, 316, 324, 335, 340, 341, 342, 344, 395, 407, 415, 421, 514, 548, 571, 574, 576)

Response: The environmental review process does not involve approving or denying projects. MPCA staff prepare an EAW, which provides information about the environmental effects of a project. Environmental review gives the public access to decision makers, helps ensure awareness and meaningful input into public and private decision making, and informs decision makers so they may write better permits and better protect the environment before a project is built. The MPCA Commissioner determines if more study is needed in the form of an EIS.

Comment 1-5: Commenters have concern that the Project will reduce their quality of life. (8, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 147, 432, 434, 546, 607)

Response: The comments are noted. However, the comments are beyond the scope of the EAW because they are not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The comments are also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 1-6: Commenters want to be able to submit comments until November 15, not October 31 as been requested by some agriculture trade groups. (21, 38, 61, 86)

Response: The MPCA extended the public comment period for this Project, and accepted comments from October 1, 2018, until 4:30 p.m. November 15, 2018.

Comment 1-7: Commenters ask that no EIS be required. (176, 308, 392)

Response: The comments are noted.

Comment 1-8: Commenters ask for a contested case hearing. (421, 571, 575, 576, 577)

Response: The comments are noted. The MPCA’s complete response to the contested case hearing request for comment number 421 is provided in the Individual NPDES Permit Denial of a Contested Case Hearing Request FOF.
Comment 1-9: Commenter asks that for the decision of requiring an EIS, the MPCA consider events that seem unlikely or unrelated based on past experience but could cause damage to our environment, such as climate change. The commenter also gives the example of the recent frac sand mine accident and spill. (406)

Response: According to Minn. R. 4410.1700, subp. 6, when deciding whether a project has the potential for significant environmental effects, the MPCA must compare the impacts that are reasonably expected to occur from the Project. To that end, this comment is beyond the scope of the EAW because the information on this issue would not inform a reasoned decision about the potential for or significance of the environmental effects of the Project under Minn. R. 4410.1700.

Also, see response to comment 7-2.

Comment 1-10: Commenter suggest that an Environmental Hazard Analysis (EHA) be prepared, to assess environmentally critical systems from reasonable threats to the environment in the event of a system malfunction or catastrophic failure. (410)

Response: The comment is noted. The MPCA conveyed this suggestion to Daley. Also, see responses to comments 8-2 and 8-6.

Comment 1-11: Commenter states that the EAW lists the total animal unit (AU) count as 5,968, while the draft permit lists 6107.7 and asks which is correct. (416)

Response: The AU differences arises because the Project description in the EAW includes the elimination of the LLP1 site (100 cows or 140 AU), while the draft Individual NPDES Feedlot Permit includes the continued operation of the LLP1 site. Also, note that the EAW rounded 5,967.7 AU to 5,968 AU.

Daley intends to eliminate the LLP1 site only upon the approval of the Project, which requires a variance from the Winona County Board of Adjustment and a conditional use permit from the Winona County Planning Commission and County Board. If the Project is approved, Daley will close the LLP1 site and will request termination of the Individual NPDES Feedlot Permit coverage for the LLP1 site, which will mean Daley will have 5,967.7 AU.

If Daley is unable to receive the variance or the conditional use permit, Daley will not conduct the expansion and the LLP1 site will remain in operation with the addition of open-lot runoff controls, in accordance with the Individual NPDES Feedlot Permit Schedule of Compliance, which will mean Daley will have 2,275.2 AU. Open-lot runoff controls are required to eliminate runoff from animal lots in order to create zero discharge from the LLP1 site.

COMMENTS CONCERNING WINONA COUNTY REGULATIONS

Comment 2-1: Commenters state that the EAW should not proceed since Winona County has an animal unit (AU) cap that the Project would exceed. (3, 17, 18, 19, 20, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36, 40, 43, 47, 48, 49, 52, 54, 60, 62, 63, 64, 65, 66, 72, 77, 79, 80, 81, 90, 94, 95, 97, 99, 108, 109, 110, 111, 112, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 175, 253, 254, 260,
Response: Winona County has a 1,500 AU cap specified in ordinance. Daley must receive a variance from the Winona County Board of Adjustment to construct the Project, which is a local governmental decision. The Winona County AU cap does not prevent the environmental review process from proceeding. In fact, the environmental review process must be complete before a decision on a variance from the county ordinance may be issued.


Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Also, see response to comment 2-8.

Comment 2-3: Commenters ask if Daley is allowed to exceed the Winona County AU cap, how will the County deny others an exception from the AU cap. (8, 114, 116, 117, 278, 381, 404)

Response: Enforcing the county ordinance is a local government responsibility, and not a function of the environmental review. As such, the comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 2-4: Commenters state that they believe the MPCA should have declined to perform the EAW, and avoided the cost associated with the EAW, until Winona County granted the AU variance. (19, 398)

Response: According to Minn. R. 4410.3100, Winona County cannot proceed in their AU variance request until the MPCA completes the environmental review process for the proposed Project.

Comment 2-5: Commenter states concern that issuing the Individual NPDES Feedlot Permit before the Winona County variance acts as bias on behalf of the dairy. (416, 574)
Response: The MPCA and Winona County are separate decision-making bodies. Daley must satisfy all permitting and approval decisions before implementing the Project. However, MPCA rules do not require local governmental decisions before the issuance of an Individual NPDES Feedlot Permit.

Comment 2-6: Commenter states that Daley Farm's expansion is subject to the Winona County Local Comprehensive Plan. (598)

Response: The comment is noted.

Comment 2-7: Commenter states that an erosion control permit from the county might be required. (412)

Response: The Individual NPDES Feedlot Permit incorporates by reference the MPCA NPDES, State Disposal System, Construction Stormwater Permit (CSW Permit). The MPCA also notified Daley of the potential need for an erosion control permit from the county.

Comment 2-8: Commenter asks how many AUs Daley had at the time of the Winona County AU cap ordinance passage and how many do they have today. (416)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Although beyond the scope of both the EAW and the Individual NPDES Feedlot Permit, the following response is provided. The current Individual NPDES Feedlot Permit issued to Daley provides coverage to three feedlot sites: Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP 1 and Daley Farms of Lewiston LLP 7.

The Daley Farms of Lewiston LLP site was permitted for 1,996.4 AUs at the time when the animal unit cap was adopted into the Winona County ordinance. The Daley Farms of Lewiston LLP site is currently permitted to have 1,996.4 AUs.

The Daley Farms of Lewiston LLP 1 was not permitted, nor was it required to be permitted, at the time when the animal unit cap was adopted into the Winona County ordinance. When the site was initially registered in 2010 it was registered to have 140 AUs. The Daley Farms of Lewiston LLP 1 site is currently permitted to have 140 AUs.

The Daley Farms of Lewiston LLP 7 was not permitted, nor was it required to be permitted, at the time when the animal unit cap was adopted into the Winona County ordinance. When the site was initially registered in 2001 it was registered to have 77 AUs. The Daley Farms of Lewiston LLP 7 site is currently permitted to have 138.8 AUs.
**Comment 2-9:** Commenter states that the EAW does not contain a meaningful assessment of the project’s compatibility with approved plans of local units of government. (421)

**Response:** EAW item 2.B. compatibility with plans and land use regulations, page 7, discusses the Winona County Zoning Ordinance.

**KARST GEOLOGY COMMENTS**


**Response:** It is well known that impounding liquids on the surface can enhance sinkhole formation, as is evident by the wastewater pond failures of Lewiston, Altura, & Bellechester. The largest risk comes from seepage from unlined or poorly lined liquid holding areas. The feedlots rules were enacted after the wastewater pond failures and the lessons learned from those failures informed the development of the feedlot design standards, which greatly limit seepage in karst susceptible areas. The primary objective is to prevent catastrophic failure of liquid manure storage areas (LMSAs) related to sinkhole formation under the structure.

The feedlot rules require LMSAs and feedlots to be located at least 300 feet from an identified sinkhole. The rule further limits liquid storage volumes for facilities that have four or more sinkholes located within 1,000 feet of the liquid storage area. The feedlot rules also use rigorous design standards to limit the seepage from liquid manure storage structures in karst susceptible areas. Limiting seepage from a liquid holding area limits the potential for sinkhole formation. The feedlot rules also require a double liner for many structures in karst susceptible areas, such as this Project. The Project incorporates a dual liner of water tight concrete/HDPE over a cohesive soil liner. There is also a tile system between the two liners to detect any issues with the primary concrete/HDPE liner so that corrective measures can be taken if a leak occurs, before a failure ensues.

Daley also conducted additional investigation work [Electrical Resistivity Imaging (ERI) performed by Toby Dogweiler, PH. D and former Professor and Chair, Department of Geoscience, Winona State University] to provide more information about the subsurface bedrock conditions below the area where
the liquid manure storage area is proposed. The ERI can be used to look for conditions that are highly likely to lead to sinkhole formation and possible failure of a LMSA and that should prohibit construction of liquid storage area on the land surface. The two main features the MPCA looks for are mechanically filled sinkholes and air filled voids or caves. MPCA review of the ERI information found there was no evidence of active sinkhole development and there was not an active karst hazard that should preclude construction.

The Project location, design plans and specifications for the liquid manure storage were reviewed by MPCA staff and found to meet the feedlot rules and Individual NPDES Feedlot Permit requirements.

**Comment 3-2:** Commenters question the safety of the proposed project in an area with karst geology.

**Response:** See response to comment 3-1.

**Comment 3-3:** Commenters state concerns that project water withdrawal will change the karst groundwater system and will contribute to manure pit failure.

**Response:** The Project’s existing wells are over 700 feet deep and draw water from the Wonewoc aquifer. The proposed additional wells would be approximately the same depth and drawing from the same aquifer. Between the Wonewoc aquifer and the ground surface there are approximately 40 feet of glacial-fluvial sediments and several geologic formations, including the Prairie du Chien Group, Jordan Sandstone, St. Lawrence Formation, Lone Rock Formation, Wonewoc Sandstone, Eau Claire Formation and the Mt. Simon Sandstone. Withdrawal of water from the Wonewoc aquifer is not expected to induce or contribute to sinkhole formation.

**Response:** See response to comment 3-1.

**Comment 3-4:** Commenters ask will fissures and geologic collapse are avoided.

**Response:** See response to comment 3-1.

Response: See responses to comments 3-1 and 3-3.

Comment 3-6: Commenter states that the ERI results should be ground truthed with deep drilling and/or deep back hoe excavations to determine if the mapped sinkhole to the northeast of the Project site is a filled sinkhole. The commenter also states that if the mapped sinkhole is a filled sinkhole the expansion should not be permitted. (595)

Response: The mapped sinkhole is greater than 300 feet from the LMSA; thus the LMSA meets feedlot rule setback requirements. Also, see response to comment 3-1.

Comment 3-7: Commenter ask how karst features were identified at the Project site and at the manure application sites. (600)

Response: Karst features were identified at the Project site and manure application sites using the “Karst Feature Inventory Points” GIS data layer. Additionally, Daley hired Chosen Valley Testing to conduct geotechnical evaluations and a karst inventory survey of the Project site, and Daley hired Toby Dogweiler, PH. D and former Professor and Chair, Department of Geoscience, Winona State University to conduct an ERI.

Also, see response to comment 3-1.

Comment 3-8: Commenter states that the mapped sinkholes on the manure application sites are inconsistent on Attachment F and Attachment G of the EAW. (600)

Response: Daley updated manure land application sites 4 and 25 to include the mapped sinkholes. See Appendix C, Errata Sheet.

Comment 3-9: Commenter states that since new sinkholes can appear, they recommend a karst walk be completed annually at the project site and manure application sites. (600)

Response: The comment is noted. Neither the feedlot rules nor the Individual NPDES Feedlot Permit require karst walks to be completed on an annual basis. Although annual karst walks are not required,
Daley views the land around the Project site and its manure application fields where manure is applied numerous times throughout the year in its normal management of the feedlot and farming of the land. Therefore, Daley would be able to identify a new sinkhole should one develop. Manure application setback requirements are applicable if a new sinkhole should develop in a field area where manure applications occur.

**Comment 3-10:** Commenter states that the EAW did not mention sinkholes, caves and other unique karst features under “nearby resources” on page 7. (416)

**Response:** EAW Item 3. geologic and soil conditions, page 9, discusses karst features.

**GROUNDWATER AND WELL COMMENTS**


**Response:** Minn. R. ch. 7020 contains specific requirements for locating, constructing, and operating feedlot facilities in Minnesota. The requirements found in rules are designed to provide protection to Minnesota groundwater. The Individual NPDES Feedlot Permit includes a LMSA, labeled as “manure basin” in the EAW; engineered design plans and construction specifications; and a manure management plan (MMP) describing how manure from the Project will be applied at agronomic rates based on the nutrient needs of the crops. The Individual NPDES Feedlot Permit does not allow any discharge of pollutants from the Project site to surface or groundwater. The MPCA staff reviewed these design plans and construction specifications and found them to meet Minn. R. ch. 7020 requirements. Additionally, Daley submitted, as a part of its Individual NPDES Feedlot Permit application materials, best management practices (BMPs) that it will implement to further protect groundwater quality.

Further, the design of the LMSA includes perimeter drain tile to control the seasonal water table near the LMSA, and allow Daley to observe if the LMSA is leaking. The Individual NPDES Feedlot Permit requires Daley to monitor the tile line and report any discharge from the site to the Minnesota Duty Officer and the MPCA.
Daley agrees to comply with special Individual NPDES Feedlot Permit conditions, beyond what is required in feedlot rule, to better mitigate nitrate loss from manure application. Daley will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the Minnesota Department of Agriculture (MDA) soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by thermometer at a depth of 6 inches.
2. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by soil temperature taken by thermometer at a depth of 6 inches.
4. Planting/seeding a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.
5. Applying manure in the spring.
6. Split applying nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.
7. Avoiding application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

Response: The MPCA acknowledges that well water in different locations in the region may have contaminants. Unfortunately, contamination is a regional problem, which many are working to address. The Project is not anticipated to increase existing contamination. See response to comment 4-1.

The Minnesota Department of Health (MDH) recommends private wells be tested for coliform bacteria once a year, nitrate every other year, arsenic and lead at least once, and manganese before a baby drinks the well water. For more information on well testing, please visit this website [http://www.health.state.mn.us/divs/eh/wells/waterquality/tips.html](http://www.health.state.mn.us/divs/eh/wells/waterquality/tips.html), or call the MDH well management program at 507-206-2700.

Additionally, at Winona County’s Household Hazardous Waste Building, 225 West 2nd Street, Winona, well water test kits are available for a fee. Call for details and to insure kits are in stock. 507-457-6563.

Comment 4-3: Commenters state concern that the Project will cause water shortages in nearby wells.

Response: EAW item 4.A. water use, page 11, discussed Daley’s application for the Minnesota Department of Natural Resources (DNR) Well Construction Preliminary Assessment and the results of the DNR’s preliminary assessment (EAW Attachment R). As a result of the DNR’s identified potential concerns, when Daley submits an application to modify its DNR Water Appropriation Permit, the DNR may require additional testing, monitoring, and any other information to make a decision on permitting the proposed wells before deciding to approve, deny, reduce, or modify Daley’s requested water use. In addition, as discussed in EAW item 11. groundwater appropriation, page 24, Minn. Stat. 103G.261 establishes domestic water as the highest priority for water when supplies are limited. The DNR has a standard procedure for investigation claims of well interference, and if DNR determines the commercial operator is causing the problem, the operator must correct it.

Comment 4-4: Commenters state concern about the process and financial burden of the DNR well dispute process.
Response: An analysis of DNR’s well dispute process and how any financial burden is addressed in that process are beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 4-5: Commenter asks what happens if there is not enough water for the Daley operation. (101)

Response: State law establishes domestic use as the highest priority when water supplies are limited. If the DNR determines that there is not enough water for the Daley operation, the DNR will limit the Daley’s Water Appropriation Permit. Also see response to comment 4-3 (4-4).


Response: The Project does not involve the use of crop pesticide, so it will not contribute to or affect pesticide contamination. Therefore, the comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 4-7: Commenter asks if the nitrogen drinking water standard is reasonable, and how the Project will change nitrogen in drinking water. (147)

Response: The reasonableness of the nitrogen drinking water standard is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project. Furthermore, water quality standards are adopted via rulemaking governed by the Minnesota Administrative Procedures Act (Minnesota Statutes Chapter 13), which requires the establishment of the need and reasonableness of the rules.
The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

The MPCA does not expect the Project to affect the amount of nitrogen in drinking water. Also, see response to comment 4-1.

Comment 4-8: Commenter asks if project impacts to drinking water are considered in the environmental review process. (147)

Response: The MPCA does consider potential impacts to drinking water in the EAW process. Please refer to EAW item 11. cumulative impacts, page 21.

Comment 4-9: Commenter asks where the Project water will come from. (147)

Response: Daley plans to use two existing wells and drill two new wells that draw from the Wonewoc aquifer for the Project water needs.

Comment 4-10: Commenter asks how the proposed Project water use of 92 million gallons is calculated. (147)

Response: Daley provided the water use at the LLP site based on the capacity of the exiting two wells and the proposed two wells. The exiting wells are able to pump 61 gallons per minute, or 32 million gallons per year, although Daley’s existing DNR Water Appropriations Permit allows for only 30 million gallons per year. Daley plans to drill the two new wells, with total capacity to pump 115 gallons per minute, or approximately 60 million gallons per year, for a grand total of 92 million gallons per year of well capacity.

Daley intentionally overdesigned the two proposed wells to provide redundancy in case of unexpected well problems. Daley does not expect to use 92 million gallons per year.

Instead, Daley estimates to use just over 75 million gallons of water per year at the LLP site. Water use includes cattle drinking water consumption, water used to cool the cattle, water use to wash the sand bedding and milking parlor equipment. Daley used existing operations to estimate water needs for cooling, sand and milking parlor wash water, and drinking water for lactating cows. Because Daley did not have detailed records for dry cow and heifer drinking water needs, Daley used an Oklahoma Cooperative Extension Service Factsheet (F-4275) to help estimate these needs. Here is a table of Daley’s estimates:

<table>
<thead>
<tr>
<th>Number of animals at LLP site</th>
<th>Daily Water use per cow</th>
<th>Daily Water use</th>
<th>Annual Water use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactating cow¹</td>
<td>3,375</td>
<td>55 gallons</td>
<td>185,625 gallons</td>
</tr>
<tr>
<td>Dry cow²</td>
<td>525</td>
<td>20 gallons</td>
<td>10,500 gallons</td>
</tr>
<tr>
<td>Heifer²</td>
<td>525</td>
<td>19 gallons</td>
<td>9,975 gallons</td>
</tr>
</tbody>
</table>

TOTAL: 75,226,500 gallons/year

¹Includes cooling water, sand and milking parlor wash water, and drinking water.
²Includes cooling water, sand wash water, and drinking water.
Comment 4-11: Commenter asks why one farm is allowed access to more water than all of its neighbors. (230)

Response: The DNR requires all users withdrawing more than 10,000 gallons of water per day or more than 1 million gallons per year, to obtain a water appropriation permit. Daley is required to obtain a permit for groundwater appropriation from the DNR, who will decide how much water may be withdrawn.

Comment 4-12: Commenter asks who pays for cleaning up polluted groundwater. (252)

Response: Daley is responsible for the investigation and, if necessary, cleanup of any chemical releases resulting in soil or groundwater contamination as a result of its activities at the feedlot. The feedlot rules and Individual NPDES Feedlot Permit do not require financial assurance or liability insurance.

Comment 4-13: Commenter asks why Daley received the DNR preliminary approval to build a well without more information and asks if the MPCA consults with the DNR before approving a project like this. (322)

Response: The DNR water use permitting process requires proposers to first submit a request for a DNR well construction preliminary assessment (Attachment R of the EAW) in order to obtain approval to drill a well. The DNR’s preliminary approval is not an approval to use or pump the wells. To use the wells, Daley must apply and receive a modification of its Water Appropriation Permit, which ensures adequate water supply is available for long-range seasonal requirements for domestic, agriculture, fish and wildlife, recreation, power, navigation and water quality. The DNR will require Daley to conduct a pump test and may also require additional testing such as an aquifer test to determine the amount of water that may be appropriated.

During the EAW preparation, the MPCA sends a copy of the EAW and the Individual NPDES Feedlot Permit to the DNR for its input. Additionally, the DNR has the ability to comment during the public comment period.

Comment 4-14: Commenter asks what measures Daley will take, and how the MPCA will monitor and corroborate, to ensure that nitrate leaching will not be exacerbated. (322)

Response: Daley will construct the LMSA to contain the liquid manure onsite, and inspect perimeter tiling to ensure the LMSA are not leaking. The commercial animal waste technician (CAWT) will land apply the liquid manure according to agronomic rates. Daley must update the MMP annually.

Additionally, the Individual NPDES Feedlot Permit requires Daley to submit an NPDES Annual report along with its application records to the MPCA annually, and the MPCA inspects Daley on a regular basis. The MPCA reviews manure application records during on-site inspections and may review application records that are submitted as part of annual reports or when the MPCA responds to a complaint.

Daley agrees to comply with special Individual NPDES Feedlot Permit conditions, beyond what is required in feedlot rule, to better mitigate nitrate loss from manure application. Daley will employ two or more of the following practices on field areas where liquid manure is applied:
1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by thermometer at a depth of 6 inches.

2. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.

3. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by soil temperature taken by thermometer at a depth of 6 inches.

4. Planting/seeding a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Applying manure in the spring.

6. Split applying nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoiding application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

Also, see response to comment 4-1.

**Comment 4-15:** Commenter ask that a study, conducted by non-biased geologists, hydrologists, soil scientists and agronomists, be conducted to determine if the use of liquid manure would help or hurt groundwater quality. (330)

**Response:** Any source of nitrates, manure included, if improperly managed may contaminate groundwater. The MPCA had determined that if the Project’s manure is stored and applied to the manure application sites according to feedlot rules and the Individual NPDES Feedlot Permit, the Project should not affect nitrate contamination to groundwater.

Also, see response to comment 4-1.

**Comment 4-16:** Commenters state concern that the aquifer recharge does not match aquifer withdraw. (412, 616)

**Response:** See response to comment 4-3.

**Comment 4-17:** Commenter states that the EAW contains no analysis of why Utica and Lewiston’s municipal wells were contaminated, and how the addition of 3832.7 AU could impact municipal water safety. (416)
Response: The MPCA consulted with the Minnesota Department of Health (MDH) and used the City of Utica and Lewiston's Wellhead Protection Plans in its evaluation of the potential for significant environmental effects. The MPCA has determined that the Individual NPDES Feedlot Permit requirements and MMP for this Project are consistent with these Wellhead Protection Plans and will not adversely impact those wells.

Also, see response to comment 4-1.

Comment 4-18: Commenter states that the variations in the Project and manure application sites minimum groundwater depth, and depth to bedrock given in the EAW should not vary so significantly since they are in the same geologic region. (416)

Response: The EAW uses estimates of depth to groundwater and bedrock derived from well records and soil surveys. Use of estimates is reliable and reasonable where exact measurements of depth to groundwater and bedrock data are not readily available.

Comment 4-19: Commenter states that the manure application sites minimum bedrock depth of “<10 feet” given in on page 9 of EAW isn't a number but is an estimate. (416)

Response: See response to comment 4-18.

Comment 4-20: Commenter states that there is no scientific assessment to determine the effectiveness of the planned actions to reduce nitrates given on page 10 of the EAW. (416)

Response: Several sources, such as the U of M Extension’s Best Management Practices for Nitrogen Use in Southeastern Minnesota (Publication # 08557), MPCA’s report Nitrogen in Minnesota Surface Waters (June 2013), and The Minnesota Nutrient Reduction Strategy (September 2014), provide an assessment of the practices contained within the Individual NPDES Feedlot Permit to reduce nitrate loss.

Comment 4-21: Commenter asks how many wells exist within a 5-mile radius and how much water do they draw, and for what purpose – drinking, irrigation, livestock or municipal purposes. (416)

Response: EAW item 4 water use, tiling and drainage, and physical alterations, page 10, discuss water use. EAW Attachment P shows nearby wells. The DNR assesses and regulates groundwater usage.

Also, see response to comment 4-3.

Comment 4-22: Commenter states that the City of Lewiston’s Wellhead Protection Plan recently changed to not include the Daley Farms’ property. The commenter asks how this change affects the ability of Daley Farms to move ahead with its proposal. (393)

Response: The change in the City of Lewiston’s Wellhead Protect Plan was a result of sealing an older well and constructing a new deeper well. See EAW item 2.C. nearby resources, page 7, for additional information.
SURFACE WATER COMMENTS

Comment 5-1: Commenters state concern that the Project will contaminate surface water. (12, 13, 14, 17, 38, 82, 87, 92, 93, 99, 100, 116, 214, 226, 246, 251, 253, 255, 260, 271, 285, 287, 289, 293, 294, 304, 394, 395, 397, 399, 402, 407, 408, 410, 412, 413, 414, 415, 416, 418, 420, 421, 480, 584, 607)

Response: Minn. R. ch. 7020 contains specific requirements for locating, constructing, and operating feedlot facilities in Minnesota. The requirements found in rules are designed to provide protection to Minnesota surface waters. The Individual NPDES Feedlot Permit includes LMSA engineered design plans and construction specifications and a MMP describing how manure from the Project will be applied at agronomic rates based on the nutrient needs of the crops. The MPCA staff reviewed these design plans and construction specifications and found them to meet Minn. R. ch. 7020 requirements.

The design of the LMSA includes perimeter drain tile to both relieve hydrostatic pressure on the walls of the structure, and allow Daley to observe if the LMSA is leaking. The Individual NPDES Feedlot Permit requires Daley to monitor the tile line and report any discharge from the LMSA to the Minnesota Duty Officer and the MPCA.

Daley agrees to comply with special Individual NPDES Feedlot Permit conditions, beyond what is required in feedlot rule, to better mitigate nitrate loss from manure application. Daley will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by thermometer at a depth of 6 inches.
2. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by soil temperature taken by thermometer at a depth of 6 inches.
4. Planting/seeding a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.
5. Applying manure in the spring.
6. Split applying nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.
7. Avoiding application of manure on field areas that are shallow to bedrock (less than 40 inches - based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

Response: The DNR monitors area lakes and streams, and determines the sustainability of the aquifer from surrounding groundwater use.

Also, see response to comment 5-1.

Comment 5-3: Commenter state concern over Project contribution to the dead zone and red algae blooms in the Gulf of Mexico. (249)

Response: See responses to comments 4-1 and 5-1.

Comment 5-4: Commenters ask how the Project will affect cold-water streams and trout populations in southeast Minnesota. (326, 574)

Response: See responses to comments 4-1 and 5-1.

Comment 5-5: Commenter ask how the Project will affect amphibian populations. (326)

Response: See responses to comments 4-1 and 5-1.

Comment 5-6: Commenter states that the EAW does not describe the Rush Creek Aquatic Management Area, Rush Creek, a designated trout stream, or the designated trout stream tributaries that lie nearby some of the manure application sites (Matt’s, Lappers, and Orlies). The commenter indicates these resources, and any Project-related impacts to these resources, should be discussed and any measure to minimize and avoid adverse impacts should be discussed. (600)

Response: EAW item 8 surface water runoff, page 18 and EAW item 11 cumulative effects, page 21, discuss Rush Creek and trout stream tributaries near the Project site and the manure application sites. The potential impacts and efforts to minimize and avoid impacts are also given in these sections.
However, the EAW did not discuss the Rusk Creek Aquatic Management Area (AMA), located just to the east of the manure application sites: Matt’s, Lappiers, and Orlies. This stretch of Rush Creek AMA contains an easement to allow angling access. Although the EAW did not discuss the Rusk Creek AMA, the same potential impacts and mitigations given in EAW item 11 cumulative effects, page 21, apply to the Rusk Creek AMA.

STORMWATER COMMENTS

Comment 6-1: Commenter states that since not all stormwater pollution prevention plans are reviewed by the MPCA, the Winona County Soil and Water Conservation District would be willing to review the SWPPP for the project. (308)

Response: The MPCA reviewed the Project Stormwater Pollution Prevention Plan (SWPPP) as part of the Individual NPDES Feedlot Permit application process. The Winona County Soil and Water Conservation District may also review the SWPPP.

Comment 6-2: Commenter states that with potentially 15 acres of new impervious surfaces from this project, and the increased rainfall amounts and intensities over recent years, designing permanent treatment to control only 1” of volume runoff from the project site may not be adequate. (308)

Response: The comment is noted. Additionally, the 1” of volume reduction is based on the last 50 years of rainfall data (1960-2010), which accounts for recent increases in rainfall amounts and intensity.

Comment 6-3: Commenter asks where the stormwater runoff basins will be located. (322)

Response: Daley will install a series of permanent stormwater runoff basins around the barn to collect, filter, and discharge the runoff. The location of these basins are indicated on the site plan developed by the project engineer hired by Daley.

Comment 6-4: Commenter asks how Daley can expect no change in stormwater runoff since rainfall events have increased over the last decade. (322)

Response: The proposed manure application sites have been in crop production for many years, and the Project will not require new areas to be turned into agriculture production land. Therefore, the effects of changes to rainfall patterns will not alter the stormwater runoff expected at the land application sites. Additionally, manure application to soils can increase soil tilth, a property that can provide increased water retention capacity of the soils so the quantity of stormwater runoff may actually be less than would be expected if the cropland in fertilized with commercial fertilizers.

Comment 6-5: Commenter states that the EAW contains no analysis of project stormwater runoff impact on water quality, water temperature, turbidity, sediment load, and nutrient, pathogen and pesticide contaminants in affected trout streams. (416)

Response: This Project’s Individual NPDES Feedlot Permit requires Daley to follow the CSW Permit, incorporated by reference in the Individual NPDES Feedlot Permit. During the development of the CSW Permit, the MPCA considered construction and post-construction stormwater impacts on water quality, water temperature, turbidity, nutrients, and sediment load. While the CSW Permit development did not
specifically include effects from pathogen contaminants, many of the measures to reduce other pollutants would reduce impacts of these pollutants.

The Project does not involve the use of crop pesticide, so it will not contribute to pesticide contamination. Therefore, the comment is beyond the scope of the EAW because the information on this issue would not inform a reasoned decision about the potential for or significance of the environmental effects of the Project under Minn. R. 4410.1700.

Pesticide analysis is beyond the scope of the feedlot rules (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, and Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090) and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 6-6: Commenter asks what will happen to the feed storage pad runoff after it enters the storage basin. (412)

Response: Feed pad runoff is stored in the LMSA (called “feedpad runoff basin” in the EAW), until it is removed by Daley and land applied. Also, see response to comment 7-1.

Comment 6-7: Commenter states that the EAW fails to adequately examine the impacts on both runoff and leaching rates of a major precipitation event. (584)

Response: The feedlot is designed in accordance with Minn. R. ch. 7020, which requires the manure handling and storage system design to accommodate the major precipitation event of the 25 year 24 hour storm.

The use of land application sites as crop fields is unchanged from the existing conditions. The fields will be tilled, planted, and harvested in the same manner as the existing practices. The amount of nutrients applied remains unchanged from existing practices. The only difference at the application sites is the source of the nutrients that will be applied to the crop, as those nutrients will now be coming from an organic source, manure. Manure application to soils can increase soil tilth, a property that can provide increased water retention capacity of the soils so the quantity of stormwater runoff may actually be less than would be expected if the cropland in fertilized with commercial fertilizers. Therefore, the runoff and leaching potential of the land application fields remains largely unaffected by the Project.

Also, see responses to comments 3-1, 4-1, 5-1, and 8-7.

Comment 6-8: Commenter states that the EAW says the project will produce 15 acres of new impervious surface, but the permit states only 8 acres of new impervious surface will be created, which impacts numerous calculations for stormwater generation, management strategies, and water temperature increases, and calls many of the MPCA's projected outcomes into questions. (416)

Response: The 836 feet by 435 feet proposed barn creates approximately 8 acres of new impervious surface. The stormwater runoff basins surrounding the barn are designed to provide permanent stormwater treatment. Further, the 440 feet by 590 feet proposed feed storage pad creates approximately 6 additional acres of new impervious surface. The feed storage pad stormwater runoff is completely contained within the feedpad runoff basin, designed as a LMSA. The stormwater stored within the feedpad runoff basin is applied at agronomical rates to manure land application sites. In
addition to the barn and feed storage pad, other buildings such as the proposed sand building and milking parlor create a total of approximately 15 acres of new impervious surface.

Comment 6-9: Commenter states that neither the EAW nor permit contain information about existing impervious surfaces at the project site. (416)

Response: The existing impervious surfaces are not regulated by the CSW permit program as they are already constructed. The comment is noted.

Comment 6-10: Commenter states that the draft permit indicates that feedpad runoff will not go into the manure basin, but the EAW (page 12) shows a portion of the feedpad runoff going into the manure basin. (416)

Response: The proposed feedpad runoff basin, designed as a LMSA, includes a float trap that will capture floating solids washed in from the feed storage pad. Daley will place these solids in the manure LMSA (called the “manure basin” in the EAW). The EAW only provides a summary of planned operations. The Individual NPDES Feedlot Permit application materials includes more of the operational details. To view the Individual NPDES Feedlot Permit application materials, go to the MPCA Public Notices webpage at https://www.pca.state.mn.us/public-notices/archive and click on “October 2018” then scroll to “Monday, October 1, 2018.”

Comment 6-11: Commenter states that no specific BMPs are mentioned in how the “permanent stormwater runoff basins around the barn [will] collect, filter and discharge.” The commenter then asks what specific measures will be taken to ensure that storm water runoff from 8.34 acres of impervious surface is handled correctly. (414)

Response: Stormwater engineering plans that provide details of BMPs are provided within the Individual NPDES Feedlot Permit application materials, available starting on October 1, 2018, at the MPCA website. To view this document, go to the MPCA Public Notices webpage at https://www.pca.state.mn.us/public-notices/archive and click on “October 2018” then scroll to “Monday, October 1, 2018.”

Comment 6-12: Commenter asks what specific measures will be taken to ensure the feedpad runoff is handled correctly. (414)

Response: Daley’s Individual NPDES Feedlot Permit application materials include design plans and construction specifications for the LMSA that will collect runoff from the proposed feed pad expansion area. MPCA reviewed the plans and found they meet feedlot rules and Individual NPDES Feedlot Permit requirements.

The draft Individual NPDES Feedlot Permit for the Project includes a Schedule of Compliance. The Schedule of Compliance requires construction/implementation of plans that were previously reviewed and approved for addressing the portion of the existing feed pad that is not meeting the discharge requirements of the Individual NPDES Feedlot Permit.
LAND APPLICATION OF MANURE COMMENTS

Comment 7-1: Commenters state concern that there is not enough land available to utilize the manure.

Response: Minn. R. ch. 7020 contains specific requirements relating to the application of manure from feedlot facilities in Minnesota. The requirements found in rules are designed to provide protection to Minnesota groundwater and surface waters and are based on University of Minnesota Extension Service recommendations. The rules require that nutrient (nitrogen) application rates from all sources (manure, commercial fertilizers, and nutrient credits from previous crops that were grown) not exceed the expected crop nitrogen needs for non-legume crops or the expected nitrogen removal for legume crops. In addition to applying nutrients from all sources at agronomic rates (nutrient applications based on nutrient needs of the crop that will be grown), the rules require nutrient testing of manure, soil testing, and calibration of equipment used for application of manure. MMPs are updated annually to adjust for newly measured levels of nutrients and crop needs. The requirements relating to manure application apply not only to the feedlot owner, but also anyone receiving manure from the Project. Daley’s Individual NPDES Feedlot Permit application includes a MMP describing how manure from the Project will be applied at agronomic rates. The MPCA reviewed the submitted MMP, including verifying that adequate land base is available for manure that will be generated from the feedlot, and found it meets Minn. R. ch. 7020 and Individual NPDES Feedlot Permit requirements.

Daley agrees to comply with special Individual NPDES Feedlot Permit conditions, beyond what is required in feedlot rule, to better mitigate nitrate loss from manure application. Daley will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by thermometer at a depth of 6 inches.
2. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by soil temperature taken by thermometer at a depth of 6 inches.
4. Planting/seeding a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.
5. Applying manure in the spring.
6. Split applying nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.
7. Avoiding application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

Failure to apply manure as required by feedlot rules and the Individual NPDES Feedlot Permit may result in MPCA enforcement.

Comment 7-2: Commenters ask if the agronomic rate calculation takes into consideration Minnesota’s changing climate. (19)

Response: The manure/nutrient application rate requirements found in the feedlot rules and the Individual NPDES Feedlot Permit are based on University of Minnesota (U of M) Extension Service recommendations. The U of M Extension Service is continually researching and evaluating the recommendations that they make. The U of M Extension Service is aware of climatic changes that have taken place in Minnesota. Because climatic changes affect continued research and evaluations that are conducted and used by U of M Extension Service for developing recommendations, climatic changes are indirectly considered.

Comment 7-3: Commenters ask if land application fields receive manure from sources other than Daley. (19, 325, 416)

Response: The feedlot rule and Individual NPDES Feedlot Permit requirements do not prohibit manure from more than one feedlot being applied on the same land; however, regardless of the feedlot site or sites where the manure originates from, the rules require that nutrient (nitrogen) application rates from all sources (manure, commercial fertilizers, and nutrient credits from previous crops that were grown) not exceed the expected crop nitrogen needs for non-legume crops or the expected nitrogen removal for legume crops.

Daley’s MMP includes information for both retained manure and transferred manure. Manure is considered “retained” when the manure will be applied on land that is owned, rented or controlled by Daley. Manure is considered “transferred” when manure from the project is transferred, sold or given away, and applied on land that is not owned, rented or controlled by Daley.

Fields that are part of Daley’s “retained” MMP only receive manure from feedlot facilities that are owned by Daley.

It is not known, or required to be known, if fields that are receiving transferred manure from the Project will also receive manure from feedlots other than Daley’s.

The feedlot rules and Individual NPDES Feedlot Permit contain manure application record keeping requirements for Daley and the land owners receiving transferred manure from the Project.

Comment 7-4: Commenters ask if nitrate levels have been monitored in any of the land application sites with devices such as lysimeters. (19, 325)

Response: Daley has not used a lysimeter to monitor nitrate levels in soil pore water at its existing manure land application sites. However, Daley must measure nutrient content of the soil and applied
manure as required by the MMP. See response to comment 7-1 for details of manure application requirements.

Comment 7-5: Commenters ask how it will be determined that the crops are absorbing the nutrients instead of going into groundwater. (19, 325, 575)

Response: See responses to comments 7-1 and 7-2.

Comment 7-6: Commenters ask that phosphorus, antibiotics, bacteria and hormones be evaluated. (17, 19, 38, 249, 271, 325)

Response: Phosphorus: The Individual NPDES Feedlot Permit requires Daley to ensure manure application fields are sampled and tested in the upper 6 inches for soil phosphorus at least once every 4 years. Soil sampling techniques must meet the most recently published sampling standards developed by either the Minnesota Extension Service or Natural Resources Conservation Service.

Additionally, Daley must apply manure in accordance with the following.

Phosphorus Management Near Waters.
Where field average soil test levels exceed 21 parts per million (ppm) Bray P1 or 16 ppm Olsen within 300 feet of a lake, stream, intermittent stream, drainage ditch without protective berms, or a public waters wetland, Daley must either:

- a. Apply manure at a rate and frequency so that manure phosphorus applied during any six year period does not exceed crop phosphorus removal during that same period; or
- b. Establish a vegetated buffer that does not receive manure application along the water provided that the buffer width is at least 100 feet along lakes and streams and is at least 50 feet wide along other waters.

Phosphorus Management on Extremely High Soil Test Phosphorus Soils.
Where field average phosphorus soil test levels exceed 75 ppm Bray P1 or 60 ppm Olsen within 300 feet of an open tile intake, lake, stream, intermittent stream, drainage ditch without protective berms, or a public waters wetland, or exceed 150 ppm Bray P1 or 120 ppm Olsen on any other land, the Permittee shall land apply manure in accordance with all of the following:

- a. When manure is surface applied without incorporation within 24 hours, annual phosphorus application rates must not exceed crop phosphorus removal in the subsequent crop;
- b. When manure is injected or incorporated (within 24 hours), reapplication of manure cannot occur until phosphorus from the previous manure application is calculated to have been removed by subsequent crops; and
- c. The approved MMP includes runoff and soil erosion prevention practices that either achieves a “very low” or “low” rating with the Minnesota Phosphorus Index originally developed for the animal agriculture GEIS (www.mnpi.umn.edu) or NRCS Technical Standard 590.

Antibiotics: See response to comment 13-1.

Bacteria: Measures in feedlot rules and in the Individual NPDES Feedlot Permit to prevent manure from reaching surface water and groundwater will also prevent the movement of bacteria to surface water and groundwater. Also, see responses to comments 4-1 and 5-1.
Hormones: According to a University of Wisconsin Extension (Fall 2011) publication, Assessing the Potential Effects of Hormones in Livestock Manure, hormones are rapidly degraded in surface water runoff, which suggests minimal impact on aquatic organisms, and efforts that prevent manure from entering waterways will likely prevent hormones from entering surface water.


Response: See responses to comments 7-1 and 7-2.

Comment 7-8: Commenter asks what does the expanded feedlot have planned for the tons of manure and wastewater. (230)

Response: See response to comment 7-1.

Comment 7-9: Commenter states that verbal agreements for spreadable acres may not be a strong enough commitment when adequate spreadable acres are so critical to this project. (308, 598)

Response: The feedlot rules and Individual NPDES Feedlot Permit do not require Daley to submit signed contracts or agreements for land areas where transfer of manure is planned, nor is Daley required to identify additional manure recipients should one of the planned manure recipients no longer accept manure from the project. Rather, the rules require nutrient application rates from all sources (manure, commercial fertilizers and nutrient credits from previous crops that were grown) not exceed the expected crop nutrient needs or removal and that manure application records are kept for both retained and transferred manure.

Comment 7-10: Commenter states concern that injecting manure when air temperature drops below 50 degrees will result in more nitrogen contaminating groundwater since the lower temperatures mean less biological activity, and asks if research has looked into this. (330)

Response: Application of manure when soil temperature is below 50 degrees is in fact a recommended BMP by the U of M Extension Service. Microbial activity in the soil slows down at cooler temperatures, therefore slowing the conversion of the ammonium and organic nitrogen portions of manure to the
The ammonium and organic forms of nitrogen are stable in the soil whereas the nitrate form of nitrogen moves with water and may leach out of the root zone over winter and early spring.

**Comment 7-11:** Commenter asks how many animal units are in Utica Township and Winona County, and ask what the animal unit carrying capacity of the area. (326)

**Response:** Based on feedlot registration, which includes all animals from farms required to be registered, there are 110,901 registered AUs in Winona County and there are 12,941 registered AUs in Utica Township.

Daley's Individual NPDES Feedlot Permit application included a MMP describing how manure from the Project will be applied at agronomic rates. The MPCA reviewed the submitted MMP, including verifying that adequate land base is available for manure that will be generated from the Project, and found it meets Minn. R. ch. 7020 and Individual NPDES Feedlot Permit requirements.

**Comment 7-12:** Commenter asks how does the Daley's manure injection protect groundwater from being contaminated, if manure is injected below the zone of biological decomposition. (326)

**Response:** Daley proposes to inject manure at a depth where is can readily be utilized by plant roots. Also, see responses to comments 7-1, 7-2 and 7-20.

**Comment 7-13:** Commenters ask how manure application sites are vetted and how often they are monitored. (575, 584)

**Response:** Daley must meet the requirements of Minn. R. ch. 7020.2225, land application of manure. The MPCA’s draft Individual NPDES Feedlot Permit, which was out for public comment from October 1, 2018, through November 15, 2018, includes requirements for land application and nutrient management, including nutrient testing of both manure and land application sites. Daley’s MMP, once approved, also becomes an enforceable component of the Individual NPDES Feedlot Permit.

Additionally, the Individual NPDES Feedlot Permit requires Daley to submit its application records to the MPCA annually, and the MPCA inspects Daley on a regular basis. The MPCA reviews manure application records during on-site inspections and may review application records that are submitted as part of annual reports or when the MPCA responds to a complaint.

Also, see response to comment 7-1.

**Comment 7-14:** Commenter asks what the cumulative impacts of pollutants and bacteria are from manure land application in areas with shallow soils over fractured bedrock to wells, aquifers and eventually the trout streams. The commenter specifically asks for this evaluation for each sub watershed – Whitewater, Garvin, and Rush. (584)

**Response:** EAW item 11 cumulative effects, page 21, discusses cumulative effects to surface water.

Also, see responses to comments 4-1 and 5-1.
Comment 7-15: Commenter states that the EAW failed to adequately examine the potential impacts of manure applications on the e. coli levels of each stream. (584)

Response: See response to comment 7-6.

Comment 7-16: Commenter states that the EAW erroneously equates liquid manure for the operations with nitrogen fertilizer. Manure contains other chemicals and bacteria, yet the EAW largely ignores their impact. (584)

Response: Measures in feedlot rules and in the Individual NPDES Feedlot Permit to prevent manure from reaching surface water and groundwater also prevent the movement of bacteria and hormones to surface water and groundwater.

Also, see response to comment 7-6.

Comment 7-17: Commenter states that the EAW fails to break out how much manure will be applied in each sub watershed and therefore misses assessing impacts. (584)

Response: See response to comment 7-1.

Comment 7-18: Commenter states “The EAW also assumes that the state mandated buffer strips and setback strips by sinkholes will be followed and are actually adequate to remove pollutants. Yet there is much research collected by BWSR and other state agencies that indicates that the 50 foot buffer strips do not remove all pollutants. This area needs further study, as does the cumulative impacts of manure applications around this many sinkholes and streams in a small area.” (584)

Response: Setback requirements were adopted via rulemaking governed by the Minnesota Administrative Procedures Act (Minnesota Statutes Chapter 13), which requires the establishment of the need and reasonableness of the rules.

Comment 7-19: Commenter states that research should be done on the sustainability of using the same fields for many years for manure dispersal and nitrate levels. (393)

Response: Comment noted.

Comment 7-20: Commenter asks what is the planned manure injection depth and will it be in the zone of biological activity. (416)

Response: The CAWT will inject liquid manure at a depth of approximately 4 to 6 inches below the soil surface, which is within the rooting zone, and therefore is readily available for uptake by growing crops.

Comment 7-21: Commenter states that verbal agreements to accept manure is inadequate, given the responsibilities and liabilities that the landowner will be subject to, and state that written contracts are needed that clearly state all risks and responsibilities. (416)

Response: The comment is noted. Also, see response to comment 7-9.
Comment 7-22: Commenter states that the EAW does not provide a breakdown of crop type for the manure land application sites with agreements to accept manure. The commenter states that this is important because not all land is eligible to receive manure. (416)

Response: Breakdown of crop type for land areas where manure will potentially be transferred to is not required by the feedlot rules, Individual NPDES Feedlot Permit or as part of the EAW.

Regardless of whether manure is being retained or transferred, the feedlot rules require that manure and process wastewater application rates be limited so that the estimated plant available nitrogen from all nitrogen sources does not exceed expected crop nitrogen needs for nonlegume crops, and expected nitrogen removal for legumes.

Nitrogen sources include commercial fertilizer nitrogen, soil organic matter, irrigation water, legumes grown during previous years, biosolids, process wastewater, and manure applied for the current year and previous years.

Comment 7-23: Commenter asks how the MPCA will ensure manure land application BMPs are followed to protect public and private wells. (414)

Response: The Individual NPDES Feedlot Permit requires Daley to submit its application records to the MPCA annually, and the MPCA inspects Daley on a regular basis. The MPCA reviews manure application records during MPCA on-site inspections and may also review application records that are submitted as part of annual reports or when the MPCA responds to a complaint.

Comment 7-24: Commenter asks what the MPCA has done to ensure that all owners/operators receiving manure from Daley understand the manure application requirements and that all manure application records, soil tests, tests for available nutrients are maintained to ensure that the water shed is not cumulatively overloaded. (414)

Response: Regardless of whether manure is being retained or transferred, the feedlot rules and Individual NPDES Feedlot Permit require that manure and process wastewater application rates be limited so that the estimated plant available nitrogen from all nitrogen sources does not exceed expected crop nitrogen needs for nonlegume crops and expected nitrogen removal for legumes.

Nitrogen sources include commercial fertilizer nitrogen, soil organic matter, irrigation water, legumes grown during previous years, biosolids, process wastewater, and manure applied for the current year and previous years.

Daley’s MMP include plans specifically for transferred manure, including providing the recipient of the manure information regarding the feedlot rule requirements.

Comment 7-25: Commenter asks how the MPCA is aggregating manure application data to ensure that the proposed project will not overload the watershed. (414)

Response: Daley is required to meet Minn. R. 7020.2225 requirements for the land application of manure. The Individual NPDES Feedlot Permit incorporates 7020.2225 requirements and also contains additional land application requirements. Minn. R. ch. 7020 and the Individual NPDES Feedlot Permit are
enforceable requirements. These requirements are designed to protect Minnesota groundwater and surface water and are based on U of M Extension Service recommendations.

The MPCA reviewed Daley’s application for coverage under the Individual NPDES Feedlot Permit. The MPCA determined that Daley’s application, if constructed as designed, and operated in accordance with the requirements of the Individual NPDES Feedlot Permit, will comply with Minn. R. ch. 7020, including Minn. R. 7020.2225 requirements, which provide requirements for land application of manure.

Comment 7-26: Commenter asks if the MPCA considered that the numerous manure application sites may have drain tile installed. (398)

Response: Tile drainage is common throughout the State of Minnesota. Tile drainage was considered when the feedlot rules were developed and adopted. Requirements in the feedlot rules are designed to provide protection to both groundwater and surface waters.

Comment 7-27: Commenter states that the MPCA provides no evidence or reasoning to support the claim that manure will replace commercial fertilizer, therefore cannot be used as mitigation to justify no significant impact. The commenter also provides evidence of farmers applying commercial fertilizer to its manured fields and farmers not knowing how much nitrogen was contained in the manure they applied. (421)

Response: The MPCA provides oversight of Daley’s compliance with feedlot rules and Individual NPDES Feedlot Permit and has enforcement authority if it finds noncompliance.

Also, see response to comment 7-30.

Comment 7-28: Commenter states that the MPCA provides no evidence or reasoning to support the claim that manure management plans prevent over application, therefore cannot be used as mitigation to justify no significant impact. (421)

Response: Daley is required to meet Minn. R. 7020.2225 requirements for the land application of manure. The Individual NPDES Feedlot Permit incorporates 7020.2225 requirements and also contains additional land application requirements. Minn. R. ch. 7020 and the Individual NPDES Feedlot Permit are enforceable requirements. These requirements are designed to protect Minnesota groundwater and surface water and are based on U of M Extension Service recommendations.

The MPCA reviewed Daley’s application for coverage under the Individual NPDES Feedlot Permit. The MPCA determined that Daley’s application, if constructed as designed, and operated in accordance with the requirements of the Individual NPDES Feedlot Permit, will comply with Minn. R. ch. 7020, including Minn. R. 7020.2225 requirements, which provide requirements for land application of manure.

Additionally, the Individual NPDES Feedlot Permit requires Daley to submit its application records to the MPCA annually, and the MPCA inspects Daley on a regular basis. The MPCA reviews manure application records during MPCA on-site inspections and may also review application records that are submitted as part of annual reports or when the MPCA responds to a complaint.
Comment 7-29: Commenter states that page 9 of the EAW only discusses the threat to endangered species from the project site and does not include the manure application sites or the species found in cold water springs. (416)

Response: All proposed manure application sites have received manure in the past and have been in crop production for many years. The Project, including the manure application sites, is not expected to have the potential for an adverse effect to endangered species.

Comment 7-30: The commenter states that the Project’s MMP will allow application of manure at rates that exceed agricultural utilization of the nutrients, in violation of 40 C.F.R. § 412.4(c), 40 C.F.R. § 122.42(e) and Minn. R. 7020.2225, subp. 3. (421)

Response: The agronomic rate requirement found in the feedlot rules and the Individual NPDES Feedlot Permit is just one of many requirements found in the feedlot rules and the Individual NPDES Feedlot Permit that are designed to protect ground and surface water quality. Other manure application related requirements in the feedlot rules and the Individual NPDES Feedlot Permit include: manure and soil testing, setbacks to sensitive features, soil hydraulic loading restrictions, soil texture restrictions, application of manure prior to predicted rainfall events of one-half inch restrictions, cover crop requirements base on timing of manure application and manure applications restrictions based on application methods and the time of year/field conditions. It is a combination of all the feedlot rule and Individual NPDES Feedlot Permit requirements that protect ground and surface water quality.

The commenter states that the proposal utilizes an erroneous University of Minnesota recommendation for nitrogen application to the corn crop. This assertion is based on commentary provided by Dr. Gyles Randall, emeritus professor University of Minnesota, which states the “Corn N Rate Calculator” should be used and results in a recommendation of a 159 lbs of Nitrogen for corn following corn or 123 lbs of nitrogen for corn following soybeans. The Corn N rate calculator is a 7 state regional tool developed primarily for use with commercial fertilizers, nonetheless, the University of Minnesota publication is consistent with the Corn N rate Calculator.

The techniques used to arrive at nutrient recommendations for the Corn N Rate Calculator and most recent University of Minnesota publication methodology were developed for commercial fertilizers meaning that it is not directly amenable to use when manure is the nutrient source. The MPCA has developed and published its interpretation of the recommendations when manure is the nutrient source. It can be found at [https://www.pca.state.mn.us/sites/default/files/wq-f8-18.pdf](https://www.pca.state.mn.us/sites/default/files/wq-f8-18.pdf).

The recommendations cited by Dr. Randall are accurate should the N price/Crop value ratio within the Corn N Rate Calculator be considered to be 0.10; however, in accordance with the MPCA interpretation, the N price/Crop value ratio most applicable to use with manure nutrients is 0.05. Using this ratio the recommendation is 180 lb N/acre for corn following corn and 140 lb N/acre for corn following soybeans, which is consistent with the MMP for the project.

The commenter also assumes 3 years of nitrogen availability/crediting from manure application. The feedlot rules and Individual NPDES Feedlot Permit requirements are based on University of Minnesota Extension Service recommendations, including 2 years of nitrogen availability/crediting from manure applications.
Dr. Randall also give his opinion of some of the specifics of the MMP, namely field characteristics that give some fields a higher pollution potential than other fields. The MPCA agrees with that assertion but the application to those fields does meet the requirements of Minn. R. 7020 and they are therefore eligible for manure application even if it is not from the proposed Project. In other words, simply removing them from the MMP for this facility does not make them ineligible for manure application from other manure or nutrient sources. The fact that these fields are covered by a MMP incorporated into the Individual NPDES Feedlot Permit for the site means that they will receive more regulation and restrictions than if they were not a part of the MMP.

Finally, Dr. Randall questions the nutrient content of the manure, specifically how it can vary so much from the “book value”. The values used in the MMP are the results of actual test from the existing facility which will be far more representative of actual conditions than a “book value” meant to generally apply to a similar operation. Further, Daley intentionally utilized a book value for the manure generated from the proposed expansion instead of the lower actual test values from the current operation so that the total amount of nitrogen identified in the MMP is higher than what will likely actually be generated at the facility. In all likelihood the nutrient content of the manure will be similar to the existing operation historical test values but the use of the higher book value will ensure that the MMP identified sufficient land available to apply the manure at agronomic rates.

Pursuant to the feedlot rule (7020.2225, supb. 1.D.), MPCA has regulatory authority over property owners that receive manure from the Project. Any person receiving manure from the Project is required to comply with the MMP of the Project and to complete their own MMP, and MPCA does and has conducted inspections of landowners receiving manure from feedlot facilities. If Daley transfers manure to other property owners MPCA will conduct inspections, as appropriate.

Additionally, the feedlot rules and Individual NPDES Feedlot Permit require manure and process wastewater application rates must be limited so that the estimated plant available nitrogen from all nitrogen sources does not exceed expected crop nitrogen needs for non-legume crops and expected nitrogen removal for legumes. Expected crop nitrogen needs, crop nitrogen removal rates, and estimated plant available nitrogen from manure and legumes must be based on the most recent published recommendations of the U of M Extension Service or of another land grant college in a contiguous state.

The MPCA reviewed the submitted MMP, including planned nitrogen application rates used in the plan, and found it meets feedlot rule and Individual NPDES Feedlot Permit requirements. In addition to feedlot rule and Individual NPDES Feedlot Permit requirements, on December 23, 2018, Daley submitted an addendum to its MMP to further prevent nitrate loss to ground and surface water. The addendum indicates that the Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by thermometer at a depth of 6 inches.
2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network.
website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by soil temperature taken by thermometer at a depth of 6 inches.

4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Apply manure in the spring.

6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

The management practices in the Daley’s December 23, 2018, addendum are incorporated as requirements in the final Individual NPDES Feedlot Permit that is issued by the MPCA.

Comment 7-31: The commenter states that the Project’s land application practices will apply manure in a manner that will result in subsurface discharges of manure to groundwater, rendering the project ineligible for permit coverage and violating Minn. R. 7020.2003, subp. 1 and 7020.2225. (421)

Response: The commenter asserts the Project does not comply with the Individual NPDES Feedlot Permit section 13.4 (no discharge to groundwater) requirements because of the karst topography and information provided in Dr. Randall’s report (Exhibit 1 of the petition) and therefore the Project is ineligible for coverage under the Individual NPDES Feedlot Permit.

Section 13.4 of the proposed Individual NPDES Feedlot Permit permit is only applicable to the facility, not the land application sites. The definition of facility is included within the Individual NPDES Feedlot Permit and reads as such: “Facility means an animal feedlot, a manure storage area, or an animal feedlot with a manure storage area that is subject to the Permit.”

Likewise, 7020.2003 subp1. is only applicable to an animal feedlot or manure storage area, not land application sites. The definition of animal feedlot in Minn. Rule 7020 reads as such: “Animal feedlot means a lot or building or combination of lots and buildings intended for the confined feeding, breeding, raising, or holding of animals and specifically designed as a confinement area in which manure may accumulate, or where the concentration of animals is such that a vegetative cover cannot be maintained within the enclosure. For purposes of these parts, open lots used for the feeding and rearing of poultry (poultry ranges) shall be considered to be animal feedlots. Pastures shall not be considered animal feedlots under these parts.” The definition of manure storage area in Minn. Rule 7020 reads as such: “Manure storage area means an area where animal manure or process wastewaters are stored or processed. Short-term and permanent stockpile sites and composting sites are manure storage areas. Animal manure packs or mounding within the animal holding area of an animal feedlot that are managed according to part 7020.2000, subpart 3, are not manure storage areas.” Neither of these definitions include land application areas.
The arguments presented are all related to land application of manure and therefore would not be subject to either Individual NPDES Feedlot Permit or rule parts cited, rendering them moot.

Even though the land application sites are not subject to the cited rules, Daley has developed a MMP in accordance with applicable state and federal regulations. This document includes practices that are designed to limit the impacts of the land application of manure, namely applying at agronomic rates, observing setbacks, and restricting the practice of winter time application of manure. In addition to feedlot rule and Individual NPDES Feedlot Permit requirements, on December 23, 2018 Daley submitted an addendum to its MMP to further prevent nitrate loss to ground and surface water. The addendum indicates that the Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by thermometer at a depth of 6 inches.

2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.

3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MN Department Agriculture soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by soil temperature taken by thermometer at a depth of 6 inches.

4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Apply manure in the spring.

6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

The management practices in Daley’s December 23, 2018, addendum are incorporated as requirements in the final Individual NPDES Feedlot Permit that is issued by the MPCA.

**Comment 7-32:** The commenter states that the MMP allows overapplying manure and applying manure to croplands featuring sinkholes and other karst features such as fractured bedrock, fissures, sinkholes and other conduits, and therefore has potential to cause or contribute to water quality standard exceedances for nitrates and bacteria, rendering the project ineligible for permit coverage and violating 40 C.F.R. §122.44(d)(1). (421)

**Response:** The commenter relies on the assertion of over application of manure to cropland as presented in response to comment 7-31.
The other contention is that the land application practices have the reasonable potential to cause or contribute to water quality standard exceedances. The requestor has not identified a disputed fact and simply states the areas are underlain by karst susceptible bedrock and its various types of surface and subsurface features (i.e. sinkholes, fractures, etc.) and therefore is an area of heightened sensitivity to impacts from surface activities like land application of manure. The MPCA agrees with this statement and uses a MMP to address these concerns. Daley has developed a MMP in accordance with applicable state and federal regulations. This document includes practices that are designed to limit the impacts of the land application of manure, namely applying at agronomic rates, observing setbacks, and restricting the practice of winter time application of manure.

The requestor also asserts that the MPCA must establish a water quality based effluent limitation for the land application sites, similar to the pollutant load allocations established for point source discharges to water bodies (i.e. wastewater plants). The application of this federal provision to land application sites is a point of law and not a disputed material fact. Furthermore, this provision of federal law is not applicable to agricultural stormwater discharges. The Individual NPDES Feedlot Permit does not authorize a discharge from land application sites that is not agricultural stormwater. Even though the discharge authorized by this Individual NPDES Feedlot Permit is not subject to this provision, the Individual NPDES Feedlot Permit NPDES permit does include conditions related to land application practices not specifically required by state or federal rule in order to minimize potential impacts from agricultural stormwater discharge. These include restrictions for application during winter, application to saturated soils, application to coarse textured soils, and application prior to expected rainfall. In addition to feedlot rule and Individual NPDES Feedlot Permit requirements, on December 23, 2018, Daley submitted an addendum to its MMP to further prevent nitrate loss to ground and surface water. The addendum indicates that the Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by thermometer at a depth of 6 inches.
2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by soil temperature taken by thermometer at a depth of 6 inches.
4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.
5. Apply manure in the spring.
6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.
7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

The management practices in Daley’s December 23, 2018, addendum are incorporated as requirements in the final Individual NPDES Feedlot Permit that is issued by the MPCA.

EMERGENCIES, SPILLS, AND CLIMATE CHANGE COMMENTS

Comment 8-1: Commenters state concern that the Manure Pits will leak or fail. (1, 5, 17, 18, 20, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36, 40, 43, 47, 48, 49, 52, 54, 59, 60, 62, 63, 65, 66, 72, 77, 79, 80, 81, 87, 90, 93, 94, 95, 97, 106, 108, 109, 110, 111, 112, 113, 118, 120, 121, 122, 123, 124, 125, 126, 127, 129, 130, 132, 134, 135, 214, 226, 325, 374, 413, 415, 463, 512, 523, 524, 534, 576, 585)

Response: See response to comment 3-1.

Comment 8-2: Commenter writes, “An adequate and realistic emergency response plan would be impossible to formulate or carry out. A catastrophic breaching of the giant manure pit is not only possible, but very likely given the history of three community sewage ponds having already drained overnight. With 4,628 cows, there is no way to "turn off" the source of contamination. Those cows must continue creating manure no matter what. It is totally unrealistic to think that the Daley operation would evacuate the cows, must less kill them. Where could they be sent to if the pits had a sudden collapse? No alternative facility is available anywhere. Instead, MPCA has no mitigation options. Those cows would continue the ongoing pollution of our aquifers for years to come.” (87, 413, 419)

Response: Daley’s Individual NPDES Feedlot Permit application materials include an Emergency Response plan. If a spill or discharge occurs, Daley is responsible for containment and cleanup, as well as notifying the State Duty Officer. Also, see response to comment 3-1.


Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.
The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Additionally, according to Minn. R. 4410.1700, subp. 6, when deciding whether a project has the potential for significant environmental effects, the MPCA must compare the impacts that are reasonably expected to occur from the Project. Feedlot rules and the Individual NPDES Feedlot Permit contain measures to prevent an LSMA failure. See responses to comments 3-1, 4-1, 5-1 and 8-2.

Comment 8-4: Commenter asks what volume of rainfall would cause the manure basin to overflow, if it is at 90% capacity when the rainfall begins. (416)

Response: Comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Although the comment is beyond the scope of the EAW and feedlot rules, the MPCA provides the following additional information on rainfall and references to other resources in response to comment 8-5.

Comment 8-5: Commenter asks with recent increased storm intensity, how can the MPCA approve design for a 25-year storm (5.4 inches in 24 hours), and asks what Daley will do when a storm exceeds this amount. (322)

Response: The feedlot rules and Individual NPDES Feedlot Permit require LMSAs that store animal manure and that receive precipitation runoff be operated and managed to provide a freeboard depth of not less than one foot or the volume generated by a 25-year, 24-hour storm event, whichever is greater.

With normal management and because the contents of LMSAs are pumped and land applied in the spring and fall, the LMSAs are not constantly being operated in a manner where there is only enough capacity for a 25-year, 24 hour storm event. Rather, for a significant portion of the year, and possibly all the time, LMSAs will have capacity to accommodate and contain storm events greater than a 25-year, 24 hour storm event. The Individual NPDES Feedlot Permit requires Daley to report to the MPCA any instance when the required freeboard depth is not being maintained and/or if a discharge of a LMSA occurs.

Also, see responses to comments 6-2 and 6-4.

Comment 8-6: Commenter asks how Daley will monitor to ensure manure spills and leaks are found as quickly as possible. (322)

Response: Daley will use a CAWT to apply manure from the Project. The CAWT is responsible for transporting manure in a manner that does not result in discharge to waters of the state as well as verifying its transporting equipment is maintained and functioning correctly. If a spill or discharge occurs, Daley or the CAWT are responsible for containment and cleanup as well as notifying the State Duty Officer.
Also, see response to comment 3-1 as it relates to leak detection from LMSAs.

**Comment 8-7:** Commenter states that manure can be spread, apparently, in an emergency, in winter in violation of the conditions of the permit, and states that what constitutes an emergency should be spelled out. (327)

**Response:** Parts 7.5.11.2 and 7.5.11.3 of the Individual NPDES Feedlot Permit provide clarification regarding what is considered an emergency application and requirements that must be followed if an emergency application needs to occur. For reference, Parts 7.5.11.2 and 7.5.11.3 of the Individual NPDES Feedlot Permit are below.

7.5.11.2 Liquid Manure Applications.

*Surface application of liquid manure to frozen or snow-covered ground after November 30 is prohibited except for emergency applications.*

*An application of liquid manure is considered an emergency only for situations beyond the control of the Permittee, such as unusual weather conditions, unavoidable equipment failure, or other circumstances that could not have been avoided with proper planning and management.*

Emergency applications shall comply with the following:

- a) Only the volume of manure that is necessary to prevent manure storage overflows may be applied. Prior to emergency application, the Permittee shall use all options for additional temporary storage within other MPCA approved LMSAs;

- b) Liquid manure application to frozen or snow-covered soil shall be only on those fields identified and approved by the MPCA in the MMP for emergency application;

- c) The application of liquid manure on frozen or snow-covered soils shall be restricted to slopes of less than or equal to four percent;

- d) The application rate is restricted to a maximum of 3,500 gallons per acre per winter season, not to exceed 60 pounds of crop available P205;

- e) Applications must be more than 300 feet from sensitive features including lakes, streams, open tile inlets, sinkholes, water supply wells, mines and quarries, intermittent streams, un-bermed drainage ditches, or public water wetlands; and

- f) The application rate of manure onto frozen or snow-covered soil shall be adjusted to preclude runoff or ponding of liquid manure during the application process.

7.5.11.3. Notification.

The Permittee shall notify the Minnesota Department of Public Safety Duty Officer toll free at 800-422-0798, and the MPCA by phone, in accordance with Part 16.1 of this Permit, within 24 hours of an emergency application of liquid manure to frozen or snow covered ground.
Comment 8-8: Commenter asks what rain event and amount of manure or stormwater in the basins would cause a failure of the manure and stormwater basins. (327)

Response: Part 8.2.2. of the Individual NPDES Feedlot Permit requires the following:

Permittee shall operate the LMSA to maintain the freeboard of the LMSA as indicated in the approved design plans and specifications and Minn. R. 7020.2100, subp. 4, item D. All LMSAs are required to have a freeboard marker.

Minn. R. 7020.2100, subp. 4, item D. states:
In addition to the designed storage volume in item C, a freeboard depth of not less than one foot. Liquid manure storage areas that store animal manure and that receive precipitation runoff must provide a freeboard depth of not less than one foot or the volume generated by a 25-year, 24-hour storm event, whichever is greater.

Also, see response to comment 8-5.

Comment 8-9: Commenter asks if the EAW considers and rules out the potential impact for a 500-year rain event, or 16-20 inches of rain within 24 hours on saturated soil, like the one they had in 2007? The commenter asks if the EAW guarantees no overflow or outwash of manure, and ask what about the effects of a tornado. (5)

Response: See responses to comments 6-7 and 8-5.


Response: See responses to comments 3-1, 8-5 and 8-8.

Comment 8-11: Commenter asks that the MPCA require Daley to have a one million dollar escrow account to pay for response/cleanup of an environmental emergency. (336)
Response: The comment is noted; however, neither state nor federal rules provide the authority for the MPCA to require this request.

Comment 8-12: Commenter asks how would the Daley’s proposed expansion impact the resilience of the region to withstand frequent extreme weather events. (326)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Also, see responses to comments 3-1, 6-2, 6-4, 8-5, and 8-8.

Comment 8-13: Commenter states that the increased precipitation from anthropogenic climate change has begun to accelerate in recent years, but the rainfall data relied on by the EAW does not take this acceleration into account, leading to under designed structures. (421)

Response: The comment is noted. Also, see responses to comments 6-2, 6-4, 8-5 and 8-8.

IMPACTS TO ROADS COMMENTS

Comment 9-1: Commenters state concern about increased traffic associated with the Project. (15, 17, 148, 249, 424)

Response: EAW Item 9, traffic and public infrastructure impacts, page 20, provide an assessment of project traffic impacts.

Comment 9-2: Commenter states that manure hauling events do not seem to be included in EAW transportation estimates. (412)

Response: Daley will hire a CAWT to apply liquid manure via a tow hose/drag line, which does not require hauling trucks.

Comment 9-3: Commenter asks if traffic estimates are round trips. The commenter also states that crop production vehicles, manure removal equipment, veterinarian traffic were not included in traffic estimates. (416)

Response: Traffic estimates include vehicles coming and going, i.e., roundtrip. See response to comment 9-1.

Comment 9-4: Commenter states that that there was no analysis of traffic safety on Hwy 14, and asks how many additional accidents and fatalities are expected to occur, should the proposal be approved. (416)
Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

AIR EMISSIONS AND ODOR COMMENTS

Comment 10-1: Commenters state concern about the odors emitted from the Project. (1, 15, 96, 100, 116, 133, 249, 255, 293, 395, 586)

Response: EAW Item 6, air and odor emissions, page 15, provide an assessment of odors. Additionally, since Minnesota has no odor rule, odor complaints are typically handled on the county or local level, as many counties, townships, and cities do have local odor nuisance rules on odor. However, odor complaints may be submitted to the MPCA, and MPCA staff will do appropriate follow-up that may include monitoring of hydrogen sulfide levels at the feedlot property line. In many cases, whether the MPCA or local authorities receive complaints, the odor may no longer be occurring as odors are transient and time-limited. It also may not be possible to determine the source of odors.

Minn. Stat. 116.0713 outlines requirements regarding livestock odor:

(a) The Pollution Control Agency must:

(1) monitor and identify potential livestock facility violations of the state ambient air quality standards for hydrogen sulfide, using a protocol for responding to citizen complaints regarding feedlot odor and its hydrogen sulfide component, including the appropriate use of portable monitoring equipment that enables monitoring staff to follow plumes;

(2) when livestock production facilities are found to be in violation of ambient hydrogen sulfide standards, take appropriate actions necessary to ensure compliance, utilizing appropriate technical assistance and enforcement and penalty authorities provided to the agency by statute and rule.

(b) Livestock production facilities are exempt from state ambient air quality standards while manure is being removed and for seven days after manure is removed from barns or manure storage facilities.

(c) For a livestock production facility having greater than 300 animal units, the maximum cumulative exemption in a calendar year under paragraph (b) is 21 days for the removal process.

(d) The operator of a livestock production facility that claims exemption from state ambient air quality standards under paragraph (b) must provide notice of that claim to either the Pollution Control Agency or the county feedlot officer delegated under section 116.07.

(e) State ambient air quality standards are applicable at the property boundary of a farm or a parcel of agricultural land on which a livestock production facility is located, except that if the owner or
operator of the farm or parcel obtains an air quality easement from the owner of land adjoining the farm or parcel, the air quality standards must be applicable at the property boundary of the adjoining land to which the easement pertains. The air quality easement must be for no more than five years, must be in writing, and must be available upon request by the agency or the county feedlot officer. Notwithstanding the provisions of this paragraph, state ambient air quality standards are applicable at locations to which the general public has access. The "general public" does not include employees or other categories of people who have been directly authorized by the property owner to enter or remain on the property for a limited period of time and for a specific purpose, or trespassers.

(f) The agency may not require air emission modeling for a type of livestock system that has not had a hydrogen sulfide emission violation.

Comment 10-2: Commenters state concern about the air emissions from the Project. (14, 116, 249, 256, 288, 312, 393, 394, 586, 607)

Response: Daley used the AERMOD dispersion model to predict emissions of hydrogen sulfide, ammonia, and selected odorous gases from the Project. The model estimated pollutant concentrations from the Project, nearby feedlots and background concentrations. Based on the results of the modeling, the MPCA does not expect significant air quality impacts. Attachment T of the EAW contains the full modeling report.

Also, see response to comment 10-1.

Comment 10-3: Commenter asks if the air emissions model takes into consideration Minnesota’s changing climate. (19)

Response: The air dispersion model calculates emission concentrations based on 5 years of weather data consisting of wind speeds, wind directions, and atmospheric stabilities. Daley used 2009 to 2013 surface meteorological data from the National Weather Service (NWS) station in Rochester, Minnesota and upper air weather data from the NWS station in Chanhassen, Minnesota. Because the model uses recent, actual, and local meteorological data, ongoing climate change effects on weather are included in the model.

Comment 10-4: Commenter asks that guidelines or rules be established for odors. (96)

Response: See response to comment 10-1.

Comment 10-5: Commenter asks if the MPCA will monitor air quality at the Daley property line. (322)

Response: See response to comment 10-1.

Comment 10-6: Commenter asks what are the greenhouse gas impacts of the project. (326, 394, 412, 416, 421, 575)

Response: The Feedlot EAW form does not currently require evaluation of greenhouse gases.
Comment 10-7: Commenter asks if the air model has been evaluated after a CAFO facility was put into place to see if the model is accurate. (393, 414)

Response: The U.S. Environmental Protection Agency (EPA), in conjunction with the American Meteorological Society, developed AERMOD through a rigorous process that involved comparisons of modeled output to monitored ambient air quality data. The result is a Gaussian plume steady-state model that predicts an unbiased, conservative, estimate of ambient air pollution concentrations. It is particularly useful to address calm wind conditions. A substantial amount of literature has been published on the comparison of modeled air quality values to ambient air quality monitoring from livestock operations. A 2010 evaluation of odor emissions from a swine production facility indicated that AERMOD performed well in comparison to ambient air measurements. A similar air modelling vs. monitoring comparison was conducted using ammonia emissions from a swine facility in 2015. In addition to recent AERMOD improvements by EPA, the MPCA has refined the applicable meteorology data to account for seasonality and snow cover. As a result, the MPCA is confident in the use of AERMOD to evaluate ambient air quality conditions from a livestock operation or any other stationary facility.

Comment 10-8: Commenter asks if the project will emit neonicotinoid insecticide dust in the cropland acres, which has been linked to colony collapse disorder in honeybees and the decline of native pollinators. (416)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Also, see response to comment 4-6.

COMPLIANCE AND ENFORCEMENT COMMENTS

Comment 11-1: Commenter asks what would happen if Daley runs out of land to apply manure to. (93)

Response: See responses to comments 7-1, 7-2, and 7-3.

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Although beyond the scope of the EAW and rules, MPCA provides the following information on feedlot compliance and enforcement:

The MPCA provides oversight and enforcement authority for feedlot facilities operating under an Individual NPDES Feedlot Permit, including the Daley feedlot.

Requirements relating to the open lots and feed pad at Daley’s existing feedlot site were originally included in the Individual NPDES Feedlot Permit issued to Daley on November 17, 2010. The November 17, 2010, Individual NPDES Feedlot Permit also included requirements relating to the reconstruction of a liquid manure storage area. Reconstruction of the manure storage area has been totally completed.

The November 17, 2010, Individual NPDES Feedlot Permit established a date of January 1, 2014, by which the feed pad and open lot areas were to be addressed. Over 90% of the feed pad area was addressed.

Throughout the effective time frame of the Individual NPDES Feedlot Permit issued on November 17, 2010, Daley had communicated with the MPCA regarding progress toward complying with Individual NPDES Feedlot Permit requirements and application materials that were being worked on for the current propose project, which includes the planned closure/elimination of the LLP 1 site rather than installing runoff controls as originally planned.

The MPCA issued an Individual NPDES Feedlot Permit to Daley on November 30, 2016. The November 30, 2016, Individual NPDES Feedlot Permit established new dates for addressing the open lot areas and the remaining portion (less than 10%) of the feed pad area that still needed to be addressed. When the November 30, 2016, Individual NPDES Feedlot Permit was drafted, the MPCA considered both the permit application that Daley was working on at that time, and the anticipated time by which it planned to have the application completed/submitted. The November 30, 2016, Individual NPDES Feedlot Permit included new requirements and dates for addressing the open lot areas and the small portion of the feed pad that still needed to be addressed. The November 30, 2016, Individual NPDES Feedlot Permit established a date of October 1, 2017, by which the remaining portion of the feed pad was to be addressed and a date of October 1, 2019, by which the open lot areas were to be addressed.

At the time the MPCA was drafting the Individual NPDES Feedlot Permit, the MPCA again considered the anticipated time frames by which the MPCA would complete the EAW and Individual NPDES Feedlot
Permitting processes. The MPCA also considered other permitting requirements (i.e. county variance and Conditional Use Permit) that Daley would need to satisfy prior to being able to start construction, as well as the construction logistics (the new barn would need to be constructed so that the livestock on the LLP 1 site could be moved into the new facilities so LLP 1 site could be closed). The MPCA considered all these factors in establishing dates by which the open lot areas and the remaining portion of the feed pad area need to be addressed. The draft Individual NPDES Feedlot Permit establishes October 1, 2019, as the date by which the remaining portion of the feed pad needs to be addressed and October 1, 2021, as the date by which the open lot areas need to be addressed.

Comment 11-3: Commenter asks why there are not governmental agencies taking enforcement action and public meetings over farming operations that don’t take care of their land, and cause soil erosion. (248)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 11-4: Commenter asks why there are not governmental agencies taking enforcement action over farming operations that apply too much nitrogen in the form of commercial fertilizers. (248)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 11-5: Commenters state that the MPCA should not issue permits when history of the operation shows continued violations. (11, 327, 382, 514, 546, 570, 571, 572, 573, 574, 575, 576, 577)

Response: The comment is noted. Also, see response to comment 11-2.

Comment 11-6: Commenters state that the MPCA has not conducted proper monitoring of Daley Farms (574, 575, 576, 588)

Response: See response to comment 11-2.

ECONOMIC IMPACT COMMENTS

Comment 12-1: Commenter states information about the history and future of dairy operations, and the positive economic impact from dairy operations. (6)
Response: The comment is noted.


Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 12-3: Commenters state that the project proposer ignored labor laws and some reference a 2/24/13 Winona Post article titled, "Federal agency rules in favor of farm workers in labor dispute." (19, 323, 325, 331, 408)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 12-4: Commenters state concern over the low price of milk and asks how the proposer will make a go at it without cutting corners in safety, quality, or animal welfare. (22)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.
The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

**Comment 12-5:** Commenter states concern that the project will reduce real estate values. (424)

**Response:** The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

**HEALTH IMPACT COMMENTS**

**Comment 13-1:** Commenters state concern over antibiotics use in the project and antibiotic resistance development. (17, 38, 416)

**Response:** Under Federal Drug Administration (FDA) regulations, effective January 1, 2017, feedlot owners, including Daley, can no longer use antibiotics on animals for general production purposes. With licensed veterinary oversight, antibiotics may still be used for specific animal health purposes. See FDA website for more information: [https://www.fda.gov/AnimalVeterinary/SafetyHealth/AntimicrobialResistance/](https://www.fda.gov/AnimalVeterinary/SafetyHealth/AntimicrobialResistance/)


**Response:** The comment is noted.
Comment 13-3: Commenter asks what are the human health impacts caused by consuming milk with pesticide residues. (326)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 13-4: Commenter asks how the project impact cancer rates in western Winona County will. (326)

Response: See responses to comment 14-8.

Comment 13-5: Commenter asks what drugs Daley administers to attempt to keep animals alive and does the facility’s manure or milk contain drug residues, including antibiotics. (416)

Response: See responses to 7-6 and 13-1.

Comment 13-6: Commenter states that the MMP endangers human health and the danger cannot be removed by a modification of the conditions of the Individual NPDES Feedlot Permit. The commenter identifies these main issues:

- the area is underlain by karst susceptible bedrock and is therefore more vulnerable to impacts from land application of manure,
- the Project is in an area of high sinkhole probability,
- there are TMDLs in the area influenced by agricultural pollutants,
- many wells in the area have high nitrate levels, and
- the public water supply for Utica is within 2 miles and some land application sites are within the DWSMA (421)

Response: The MPCA acknowledges these issues, but disagrees that the conditions of the Individual NPDES Feedlot Permit cannot address them. The Individual NPDES Feedlot Permit and Project MMP contains requirements and management practices that mitigate these items. Some of the requirements found in the Individual NPDES Feedlot Permit and management practice in the Projects MMP that mitigate concerns relating to the items noted include:

a) Manure cannot be applied to land in a manner that will result in a discharge to waters of the state during the application process.

b) The rate at which manure is applied cannot exceed the hydraulic loading capacity of the land application site based on soil conditions.

c) The application of manure at rates so the estimated nitrogen available to crops from all nitrogen sources (including commercial fertilizer) does not exceed expected annual crop nitrogen needs for non-legumes and expected nitrogen removal for legumes.

d) Manure application is prohibited within 100 feet of a well, mine, or quarry.

e) Manure application is prohibited within 300 feet of a sinkhole unless one of the following protective measures is employed:
1. Manure is not applied within 100 feet of the sinkhole and manure is injected or incorporated prior to rainfall or within 24 hours (whichever occurs first) within 300 feet of the sinkhole; or
2. A protective berm exists that prohibits runoff from entering the sinkhole. Daley’s MMP indicates manure will either be directly injected into the soil or incorporated into soil within 24 hours of application and prior to rainfall.
   
f) Daley’s MMP indicates manure will either be directly injected into the soil or incorporated into soil within 24 hours of application and prior to rainfall.

Furthermore, Daley has recognized these issues and made adjustments to the MMP to help minimize impacts from the Project proposal, these include:

Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by thermometer at a depth of 6 inches.
2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by soil temperature taken by thermometer at a depth of 6 inches.
4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.
5. Apply manure in the spring.
6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.
7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

AGRICULTURAL PRACTICE COMMENTS


Response: The State of Minnesota does not have a cap on the size of feedlots. Zoning and land use decisions are made by local units of government. Winona County has a 1,500 animal unit cap. For this Project to proceed, Daley will require a variance from the Winona County Board of Adjustment and a
conditional use permit from the Winona County Planning Commission and County Board to construct the Project.

Comment 14-2: Commenter would like animal operations to be small and medium sized farms, where pasture grazed animals would spread manure in a more natural way, and reduce the concentration of animals. (1)

Response: See response to comment 14-1.

Comment 14-3: Commenter would like feedlots of a certain size to be required to install anaerobic manure digesters to partially treat the sewage, recover methane, generate heat or electricity, and reduce pathogens and odors. The commenter suggests that state or federal loan program could help with financing. (1)

Response: The comment is noted.

Comment 14-4: Commenter asks how many dairy cows are there today compared to five years ago. The commenter believes with there may be fewer dairy cows because many operations have gone out of business. (248)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 14-5: Commenter asks that the MPCA consider requiring municipal-grade waste treatment or an anaerobic digester. (259)

Response: The comment is noted. Also, see response to comment 14-6.

Comment 14-6: Commenters ask why a waste water treatment plant isn’t required to treat the animal waste. (278, 345)

Response: Neither state nor federal rules provide the authority for the MPCA to require animal waste to be treated by the same treatment systems as human waste.

Comment 14-7: Commenter states that dairies are immoral. (306)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.
The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 14-8: Commenter states that the project promotes animal cruelty. (309, 439)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 14-9: Commenters asks about Daley's uses of antibiotics, and if Daley has a plan to decrease its use of antibiotics. (326, 408)

Response: See responses to comments 7-6 and 13-1.

Comment 14-10: Commenter states the decline of pollinators and asks if Daley uses Roundup Ready crops and seeds treated with neonicotinoid insecticides. (326)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 14-11: Commenter asks how big must our factory farms get before we realize that we have lost all perspective, all common sense and dignity regarding the way we raise our food, must corporate farming be the only way, is completely separating ourselves from the food growing process really a healthy way to proceed, is it really in our best interest to let corporate economics drive farming to the extent that small farmers are forced out. (460)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Also, see response to comment 14-1.
Comment 14-12: Commenter states that Daley's row cropping land use contributes to water impairments through soil, nutrient, and pesticide loss from fields where manure and commercial fertilizer and pesticides are applied, and bacteria from manure applied to row crop fields pollute the watershed. (420)

Response: The comment is noted. Also, see responses to comments 4-1, 5-1, and 7-6.

Comment 14-13: Commenter states that consumers are increasingly concerned that non-organic milk contain residues of pesticides, and ask if milk from the Daley Farms contain pesticide residues. (326)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

MISCELLANEOUS COMMENTS

Comment 15-1: Commenter asks who is financially responsible for cleaning up contamination if the business goes under. (1)

Response: A feedlot operating under an NPDES permit is responsible for cleaning up any contamination that it causes.

Comment 15-2: Commenter sent court documents from a proposed hog farm in Dodge County. (42)

Response: The documents are noted.

Comment 15-3: Commenters state concern over project-generated noise. (133, 255)

Response: Construction of the Project will create a temporary increase in noise, mostly due to construction equipment and delivery truck traffic, especially during earthwork operations. Typical construction noises, such as saws, pneumatic/electric power tools, and hand tools will also be present. Project construction noise will be limited to daylight hours as to minimize nuisances to neighboring properties. Operation of the Project will create minor amounts of noise, although not much more than what is already present at the Project site.

Comment 15-4: Commenter asks if there are any mechanisms in the EAW process to allow for input from youth under 18, and also asks if there is special consideration given to children related to the owner who are likely to be forced to provide free or underpaid labor. (147)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.
The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 15-5: Commenter states that there are no properties listed in the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project. (177)

Response: The comment is noted.

Comment 15-6: Commenter states concern over the timing of the public information meeting, saying that meetings should not be held during harvesting season since it allows for limited input from farmers. (360)

Response: Minn. R. 4410.04000, subp. 2, directs the MPCA, as the RGU, to comply with the environmental review process in a timely manner. The MPCA is unable to avoid having public meetings during harvest season.

However, the MPCA Commissioner responded to these concerns by deciding to extend the public comment period an extra 15 days to help alleviate the time pressure farmers were experiencing.

Comment 15-7: Commenters state that dairy is detrimental to human health. (292, 298, 306)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 15-8: Commenter states that the animal mortality building’s location is not given and asks if the MPCA will know the location before determining the need for an EIS. (322)

Response: Daley is not sure of the exact location of the animal mortality building; however, Daley indicated that the most likely location would be near the proposed sand storage building. The location of the animal mortality building is not essential to the Commissioner’s decision on potentially significant environmental effects from the Project.

Comment 15-9: Commenter asks why the MPCA would approve the expansion without an EIS when the MPCA list resources, such as drinking water supply management areas, public wells, recreation areas etc., in close proximity to the project. (322)

Response: The existence of drinking water supply management areas, public wells, and recreation areas near a proposed project sites does not automatically mean there will be potentially significant environmental effects from the Project.
The Commissioner of the MPCA will make the determination on the potential for significant environmental effects after reviewing all the information in the EAW, comments, any new information, and responses to comments, applying the criteria specified in Minn. R. 4410.1700 subp. 7.

Comment 15-10: Commenter asks how the MPCA will quantify and corroborate the EAW statement, “Daley will minimize construction in the grassed waterways.” (322)

Response: The DNR Natural Heritage Information System (NHIS) review provided in Appendix K of the EAW recommends Daley limit disturbance near wetland and grassland areas from April through July to minimize disturbance to rare species (Wilson’s phalaropes and loggerhead shrike) in the vicinity of the Project. Daley intends to minimize disturbance by following the avoidance recommendations of the DNR.

Comment 15-11: Commenter asks if the project will increase the amount of land in row crop production, since the animals will be confined and not pastured. (326)

Response: Proposed manure land application sites have been in crop production for a long time, and no new land is expected to be needed for crop production.

However, Daley anticipated there might be some localized conversion of soybean/corn row crops to alfalfa fields due to increased demand for cattle feed.

Comment 15-12: Commenter asks what the life expectancy of the Daley’s proposed expansion is. (326)

Response: The comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 15-13: Commenter suggests that guidelines be developed for mega-dairy farms in Minnesota, so that future requests are placed within a forum that does not pit environmentalists against business and economic interests. The commenter continues to state that there is too much US vs THEM in our discourse. (558)

Response: The comment is noted. However, the comment is beyond the scope of the EAW because it is not directed to the criteria in Minn. R. 4410.1700 regarding the potential for significant environmental effects of the proposed Project.

The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 15-14: Commenter asks if the 281 days of manure storage includes sand wash water and natural precipitation. (412)
Response: Yes, the 281 days of storage includes sand wash water and natural precipitation.

Comment 15-15: Commenter asks if the EAW should have read “technician” instead of “Technical” (page 13) and “designed” instead of “deigned” (page 19). (412)

Response: Yes, “Technical” and “deigned” were typos. These errors are noted in Appendix C, errata sheet.

Comment 15-16: Commenter asks how feeding the increase in animals will affect land use, such as needing to convert hay or pasture land to row crops, which impact ground and surface water resources. (416)

Response: See response to comment 15-11.

Comment 15-17: Commenter questions how the manure storage is proposed to expand from 22.0 MG to 35.6 MG while the proposed AU more than doubles. (416)

Response: The feedlot rules and Individual NPDES Feedlot Permit require that the Project have a minimum of 9 months storage capacity for manure that will be generated from the feedlot. The existing LMSAs at the site currently provide more than the minimum 9 months of storage. The Project expansion will use both the capacity of the existing LMSAs and a proposed LMSA to provide the required storage capacity. Therefore, although the proposed AU at the site will more than double, it is not necessary or required that Daley double the manure storage capacity.

Comment 15-18: Commenter asks what the average mortality rate for a dairy farm in Minnesota is and how does that compare to Daley’s project mortality rate. (416)

Response: Comment is beyond the scope of the EAW because the information on this issue would not inform a reasoned decision about the potential for or significance of the environmental effects of the Project under Minn. R. 4410.1700.

Comment is beyond the scope of the feedlot rules (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, and Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090) and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 15-19: Commenter asks how many AU are already in the county, Utica Township, and in the two sub-watersheds, and what percentage of the AU in Utica Township would be from Daley Farms of Lewiston. (416)

Response: EAW item 11 cumulative effects, page 21, provides a discussion on the AUs within Winona County and within the sub-watersheds.

Comment 15-20: Commenter asks what contaminants – chlorine, acids, detergents, antibiotics, chlorhexidine, barn pesticides, are found in process wastewater that is added to the manure basin. The commenter also asks when land applied how these chemicals impact soil organisms and do they leach into groundwater and do they contaminate drinking water supplies. (416)
Response: Daley cleans its milking equipment, and will continue to discharge this wastewater to its LMSA. Daley’s Individual NPDES Feedlot Permit contains requirements for land application.

Also, see responses to comments 4-1 and 5-1.

Comment 15-21: Commenter references the EAW language, "Project proposer supplied reasonably accessible data for, but did not complete the final worksheet" then asks what the MPCA did to access the accuracy of this data. (414)

Response: Minn. R. 4410.04000, subp. 2, directs the MPCA, as the responsible governmental unit (RGU), to verify the accuracy of environmental documents and comply with the environmental review process in a timely manner. The MPCA creates a technical team of internal and external experts to verify the data submitted by a project proposer. Often the MPCA requires additional information or clarification of information submitted by a project proposer.

Comment 15-22: Commenter states that there is a disconnect between the way we regulate human waste, treated underground where bacteria can remove harmful pathogens, vs. animal waste, which can be spread on farmland without significant pre-treatment, and while the manure is breaking down it can be washed into streams, encounter karst features that allow it to affect groundwater. (398)

Response: The comment is noted.

Also, see responses to comments 7-1 and 7-6.

Comment 15-23: Commenter states that the EAW did not state that a water use permit (for construction dewatering) was required, or provide a justification why the permit was not necessary. (421)

Response: Daley does not anticipate needing to pump greater than 10,000 gallons per day for construction dewatering purposes. It is the MPCA’s standard practice to only list permits in the EAW that are required, and not provide justification for permits not required.

Comment 15-24: Commenter states that the Project’s MMP will result in discharges to waters of the U.S. through hydrologically connected groundwater, rendering the project ineligible for permit coverage and violating Minn. R. 7020.2003, subp. 2. (421)

Response: Minn. R. 7020.2003 subp2. is only applicable to an animal feedlot or manure storage area, not land application sites. The definition of animal feedlot in Minn. R. 7020 reads as such: “Animal feedlot means a lot or building or combination of lots and buildings intended for the confined feeding, breeding, raising, or holding of animals and specifically designed as a confinement area in which manure may accumulate, or where the concentration of animals is such that a vegetative cover cannot be maintained within the enclosure. For purposes of these parts, open lots used for the feeding and rearing of poultry (poultry ranges) shall be considered to be animal feedlots. Pastures shall not be considered animal feedlots under these parts.” The definition of manure storage area in Minn. Rule 7020 reads as such: “Manure storage area means an area where animal manure or process wastewaters are stored or processed. Short-term and permanent stockpile sites and composting sites are manure storage areas. Animal manure packs or mounding within the animal holding area of an animal feedlot that are
managed according to part 7020.2000, subpart 3, are not manure storage areas.” Neither of these definitions include land application areas.

The arguments presented are all related to land application of manure and therefore would not be subject to the rule parts cited, rendering them moot.

Land application discharges are regulated by the NPDES permit program unless they are agricultural stormwater discharges. 40 CFR 122.23 (e) reads “Land application discharges from a CAFO are subject to NPDES requirements. The discharge of manure, litter or process wastewater to waters of the United States from a CAFO as a result of the application of that manure, litter or process wastewater by the CAFO to land areas under its control is a discharge from that CAFO subject to NPDES permit requirements, except where it is an agricultural storm water discharge as provided in 33 U.S.C. 1362(14). For purposes of this paragraph, where the manure, litter or process wastewater has been applied in accordance with site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter or process wastewater, as specified in §122.42(e)(1)(vi)-(ix), a precipitation-related discharge of manure, litter or process wastewater from land areas under the control of a CAFO is an agricultural stormwater discharge.” The draft Individual NPDES Feedlot Permit does not authorize a discharge from land application sites that is not agricultural stormwater. Therefore, unless there is non-compliance with the Individual NPDES Feedlot Permit, the facility will comply with the discharge standards in state and federal rule.

Even though the land application sites are not subject to the cited rules, Daley has developed a MMP in accordance with applicable state and federal regulations. This document includes practices that are designed to limit the impacts of the land application of manure, namely applying at agronomic rates, observing setbacks, and restricting the practice of winter time application of manure. In addition to feedlot rule and Individual NPDES Feedlot Permit requirements, on December 23, 2018, Daley submitted an addendum to its MMP to further prevent nitrate loss to ground and surface water and agricultural stormwater discharge. The addendum indicates that the Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by thermometer at a depth of 6 inches.
2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by soil temperature taken by thermometer at a depth of 6 inches.
4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.
5. Apply manure in the spring.
6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

The management practices in Daley’s December 23, 2018, addendum are incorporated as requirements in the final Individual NPDES Feedlot Permit that is issued by the MPCA.

Comment 15-25: Commenter states that the MMP allows practices of over applying manure and applying manure to croplands featuring sinkholes and other karst features that will cause or contribute to a violation of water quality standards and for which the state has performed a pollutant load allocation, where the agency has not demonstrated there are sufficient remaining pollutant load allocations to allow for the new discharge, in violation of 40 C.F.R. § 122.4(i) and state law. (421)

Response: Pollutant load allocations are designated for point source discharges, such as a wastewater treatment plant. The production area of a permitted CAFO (ie. animal holding areas, manure storage areas, etc.) is assigned a load allocation of zero as it is considered a point source. The proposed facility is designed to meet the zero load allocation assigned to it. In regards to the land application sites, as discussed in the responses to CCH Comment numbers 2, 3, and 4, the draft Individual NPDES Feedlot Permit only authorizes agricultural stormwater discharge from the land application sites. Agricultural stormwater is not a point source discharge, it is a non-point discharge. Total maximum daily loads (TMDLS) manage non-point discharges, such as agricultural stormwater, through the use of BMPs and MMPs to help limit impacts from these sources. In addition to feedlot rule and Individual NPDES Feedlot Permit requirements, on December 23, 2018, Daley submitted an addendum to its MMP to further prevent nitrate loss to ground and surface water and agricultural stormwater discharge. The addendum indicates that the Project will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by thermometer at a depth of 6 inches.

2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.

3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by soil temperature taken by thermometer at a depth of 6 inches.

4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Apply manure in the spring.
6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

The management practices in Daley’s December 23, 2018, addendum are incorporated as requirements in the final Feedlot Permit that is issued by the MPCA.
APPENDIX C

Minnesota Pollution Control Agency
Daley Farms of Lewiston, LLP – 2018 Dairy Expansion

ERRATA SHEET

1. The EAW had a typo on page 13: "Technician" should have been written instead of "Technical."

   Daley will hire a Commercial Animal Waste Technical Technician (CAWT) licensed by the Minnesota Department of Agriculture for manure application to the fields.

2. The EAW had a typo on page 19: "designed" should have been written instead of "deigned."

   The manure basin and feedpad runoff basin are designed to contain precipitation falling in the basins, and therefore no manure-contaminated runoff should occur.

3. The EAW Attachment G, individual manure application site maps 4 and 25, did not have sinkholes identified. Daley updated these maps to included sinkholes, included in this Appendix (see the next two pages).
MANURE APPLICATION NOTES:
Winter application is NOT permitted within 300’ Buffer or slopes greater than 6%.
Non-Winter application within 300’ Buffer needs 100’ grass buffer on rivers and lakes, or 50’ grass buffer on all other waterways. If insufficient buffer or within Tile Intake Buffer you must incorporate immediately.
There is NO application within 25’ of any waterway and within 100’ of all wells.
If soil tests exceed 21ppm Bray/16ppm Olsen in 300’ Buffer, Phosphorus must be applied at crop removal rates.

Legend
- Field Boundary
- Stream (Intermittent)
- Karst Feature
- Karst_No_Application
- Karst_Special_Protection_Area
- 300ftSetback

Soil Restrictions
- No Restriction
- Shallow Bedrock
- Well 300’ Buffer
- CWI - Known Wells
MANURE APPLICATION NOTES:
Winter application is NOT permitted within 300’ Buffer or slopes greater than 6%.
Non-Winter application within 300’ Buffer needs 100’ grass buffer on rivers and lakes, or 50’ grass buffer on all other waterways. If insufficient buffer or within Tile Intake Buffer you must incorporate immediately.
There is NO application within 25’ of any waterway and within 100’ of all wells.
If soil tests exceed 21ppm Bray/16ppm Olsen in 300’ Buffer, Phosphorus must be applied at crop removal rates.

Legend

- Field Boundary
- Stream (Intermittent)
- NWI - Wetland
- Karst Feature
- Karst_No_Application
- Karst_Special_Protection_Area
- Soil Restrictions
  - No Restriction
  - Shallow Bedrock
  - CWI - Known Wells

300ft Setback

0 100 200 400 600 800 Feet
LIST OF COMMENT LETTERS RECEIVED ON SUPPLEMENTAL EAW

619. k l. Email received January 21, 2020.
622. Deborah Niebuhr. Email received January 26, 2020.
628. Lawrence Landherr. Email received January 28, 2020.
629. Elizabeth Olson. Email received January 28, 2020.
632. Kathryn Hong. Email received January 28, 2020.
635. Dr. Todd Olson. Email received January 28, 2020.
638. Carla M. Benjamin. Email received January 29, 2020.
644. Thanh Lo. Email received January 30, 2020.
646. Tom Griffin. Email received January 30, 2020.
649. Mike Ferguson. Email received January 30, 2020.
656. Thomas Szalapski. Email received January 30, 2020.
659. Sharon Bachman. Email received January 30, 2020.
681. Peggy Endres. Email received January 30, 2020.
682. Danielle Engle. Email received January 30, 2020.
684. Craig Kvamme. Email received January 30, 2020.
690. Jan Ackerman. Email received January 30, 2020.
695. Mary Pouliot. Email received January 31, 2020.
698. Dave Huberty. Email received January 31, 2020.
703. Dr. Elizabeth Oness. Email received January 31, 2020.
705. Patricia Donaldson. Email received January 31, 2020.
706. Sonja Trom Eayrs, Dodge County Concerned Citizens. Email received February 1, 2020.
707. Lori Kampa. Email received February 1, 2020.
708. Mary Ann Lundquist. Email received February 1, 2020.
709. Thomas G. Dickinson. Email received February 1, 2020.
710. Renee Bjork. Email received February 1, 2020.
711. Janice Hallman. Email received February 1, 2020.
712. Julius Salinas. Email received February 1, 2020.
713. Sally Padgett. Email received February 1, 2020.
714. Sonja Trom Eayrs, Dodge County Concerned Citizens. Email received February 1, 2020.
715. Sonja Trom Eayrs, Dodge County Concerned Citizens. Email received February 1, 2020.
716. Jake Stacken. Email received February 1, 2020.
717. Jerry Lelou. Email received February 1, 2020.
718. Keith F. Johnson. Email received February 1, 2020.
719. Mary Jo Bibby. Email received February 2, 2020.
721. Sonja Trom Eayrs, Dodge County Concerned Citizens. Email received February 2, 2020.
724. Janette Dean. Email received February 2, 2020.
725. Mike Menzel. Email received February 2, 2020.
726. Lizzy Haywood. Email received February 2, 2020.
731. Heron Diana. Email received February 3, 2020.
734. Sharon Kutter. Email received February 3, 2020.
735. Elizabeth Jarrett Andrew. Email received February 3, 2020.
737. Mike Tauber. Email received February 3, 2020.
742. Sonja Trom Eayrs. Email received February 5, 2020.
743. Brad Trom. Email received February 5, 2020.
746. Cedric Speltz. Email received February 6, 2020.
748. Michelle Gobely. Email received February 6, 2020.
749. Chad Theede. Email received February 6, 2020.
750. Lois Brink. Email received February 7, 2020.
752. Mary Vlazny. Email received February 7, 2020.
753. Joseph Wenzel. Email received February 8, 2020.
754. Helen Kowalski. Email received February 9, 2020.
755. Mary Ellen Frame. Email received February 9, 2020.
769. Tom Barnes. Email received February 17, 2020.
800. Donald Hall. Letter received February 24, 2020.
827. (Repeat of #809) Laurie Fischer, American Dairy Coalition. Email received February 20, 2020.
829. Val Green. Email received February 20, 2020.
830. Michael Martinson. Email received February 20, 2020.
832. Coral Bastien. Email received February 21, 2020.
Laura and Jerry Radeke. Letter received February 26, 2020.
Mel and Sharon Thelen. Letter received February 26, 2020.
Margaret Spicher. Letter received February 26, 2020.
Carol Harder. Letter received February 26, 2020.
Maria Lindberg. Letter received February 26, 2020.
Christopher Olson. Letter received February 26, 2020.
Madeleine Poling. Letter received February 26, 2020.
Thomas Birkey, M.D. letter received February 26, 2020.
Kathleen Richards. Letter received February 27, 2020.
Gertrude Lambert. Letter received February 27, 2020.
Linda Peck. Letter received February 27, 2020.
Gail Loverud. Letter received February 27, 2020.
Marcia Finnerty. Letter received February 27, 2020.
Darwin Dyce. Letter received February 27, 2020.
Nancy Ebel. Letter received February 27, 2020.
Beth Rose. Letter received February 27, 2020.
Edwin Maus. Letter received February 27, 2020.
Marcella Bode. Letter received February 27, 2020.
John Waller. Letter received February 27, 2020.
Mary and John Van Cor. Letter received February 27, 2020.
Diane Kaplan. Letter received February 27, 2020.
Alice Peters. Letter received February 27, 2020.
Robert Carrier. Letter received February 27, 2020.
905. Tom Mahoney. Letter received February 27, 2020.
906. Mary Leach. Letter received February 27, 2020.
907. Rebecca Shedd. Email received February 25, 2020.
909. Catherine Sullivan. Email received February 26, 2020.
910. Dean A. Borgeson. Email received February 27, 2020.
911. James Pelowski. Email received February 27, 2020.
912. Loni Kemp. Email received February 27, 2020.
914. Ben Ekern. Email received March 1, 2020.
915. Kim Hiltner. Email received March 1, 2020.
916. Glen Groth. Email received March 2, 2020.
917. Margaret M. Walsh. Email received March 2, 2020.
918. Lois Norrgard. Email received March 2, 2020.
991. Mike Kennedy. Email received March 4, 2020.
1018. Deirdre Flesche. Letter received March 5, 2020.
1020. Keith Relyea and Jeannie Kant. Letter received March 5, 2020.
1023. Leo Hemmesch. Letter received March 5, 2020.
1037. (Repeat of #911) James Pelowski. Letter received March 6, 2020.
1042. Land Stewardship Members. Letter received March 6, 2020.
1067. Mary Rice and Don Davies. Letter received March 6, 2020.
1068. Laura Hoeschen. Letter received March 6, 2020.
1072. Thomas Richards. Email received March 5, 2020.
1073. Emily Newhall. Email received March 6, 2020.
1074. Deborah Allen. Email received March 6, 2020.
1075. Bonnie Haugen. Email received March 6, 2020.
1076. Colleen Vachuska. Email received March 6, 2020.
1078. Barton Seebach. Email received March 5, 2020.
1079. (Repeat of #1076) Colleen Vachuska. Email received March 6, 2020.
1080. Melia Haugen. Email received March 6, 2020.
1081. Kathleen Weflen. Email received March 5, 2020.
1082. Lucas Sjostrom. Email received March 6, 2020.
1083. Dennis Hatleli. Email received March 4, 2020.
1084. Sarah Riedl. Email received March 6, 2020.
1085. Angela Anderson. Email received March 6, 2020.
1086. Bill Adamski. Email received March 6, 2020.
1087. Stacia Sonderman. Email received March 6, 2020.
1088. Amy Cordry. Email received March 5, 2020.
1089. Angela Smith. Email received March 6, 2020.
1090. Virginia Homme. Email received March 6, 2020.
1091. Peter Vachuska. Email received March 6, 2020.
1092. Dave Shanahan. Email received March 4, 2020.
1093. Mary Lou Wilm. Email received March 5, 2020.
1094. Michael Overend. Email received March 5, 2020.
1095. David Heublein. Email received March 4, 2020.
1097. Scott Winslow. Email received March 6, 2020.
1098. Amber Hanson Glaeser. Email received March 6, 2020.
1099. Janel Dean. Email received March 6, 2020.
1100. Lori Wellman. Email received March 6, 2020.
1101. Julie Gordon. Email received March 6, 2020.
1102. Lauren Servick. Email received March 6, 2020.
1103. Areanna Lakowske. Email received March 6, 2020.
1104. Brian and Betty Singer-Towns. Email received March 5, 2020.
1105. Brent and Polly Greden. Email received March 6, 2020.
1106. Kate Anderson. Email received March 6, 2020.
1107. Tessa Schweitzer. Email received March 6, 2020.
1108. Bruce Kuehmichel. Email received March 6, 2020.
1109. Jenny Scholtes. Email received March 6, 2020.
1113. Virginia Lynn. Email received March 6, 2020.
1114. Jo Marie Thompson. Email received March 5, 2020.
1115. Steve Jorissen. Email received March 5, 2020.
1117. Margot Monson. Email received March 6, 2020.
1119. Mary Jo Bibby. Email received March 5, 2020.
1120. Joan Redig. Email received March 5, 2020.
1121. Lois Brink. Email received March 5, 2020.
1122. Chris Loetscher. Email received March 5, 2020.
1123. Kay Slama. Email received March 5, 2020.
1124. Steve Bibby. Email received March 5, 2020.
1125. Lisa Chou. Email received March 6, 2020.
1126. Ken Tschumper. Email received March 6, 2020.
1127. Herb and Carol Inderrieden. Email received March 6, 2020.
1128. Laurel Zaepfel. Email received March 5, 2020.
1129. Lawrence Landherr. Email received March 5, 2020.
1130. Theresa Zeman. Email received March 6, 2020.
1131. Sean Carroll. Email received March 6, 2020.
1132. Rose Kelly. Email received March 5, 2020.
1133. Sarah Carroll. Email received March 6, 2020.
1136. Julia Wilber. Email received March 5, 2020.
1137. Margaret Cherne-Hendrick. Email received March 6, 2020.
1138. Lori Wellman. Email received March 6, 2020.
1139. Pete Sajadi. Email received March 6 2020.
1140. Tim Ahrens. Email received March 6, 2020.
1141. Tara Ritter. Email received March 6, 2020.
1142. Scott Ellinghuysen. Email received March 6, 2020.
1143. (Repeat of #1142) Scott Ellinghuysen. Email received March 6, 2020.
1144. Eric Lindberg. Email received March 6, 2020.
1145. Amanda Bilek. Email received March 6, 2020.
1146. Gary Rettke. Email received March 5, 2020.
Note: Including copies of the individual comment letters would have made this PDF document too large. Instead, they are available in a separate PDF.
The Minnesota Pollution Control Agency (MPCA) received a number of comments on the Supplemental Environmental Assessment Worksheet (EAW). See Appendix A for the complete list of comments. In this Appendix, the MPCA responds to new comments on the Supplemental EAW, grouped by themes. Comment numbering in this document starts with Comment 16-1, which is a continuation of the numbering used in the January 4, 2019, response to comments that were submitted on the original 2018 EAW.

Although the focus of the Supplement to the 2018 EAW was on greenhouse gas (GHG) emissions, some commenters commented again on issues addressed in the 2019 Findings. Responses provided herein to these non-GHG gas comments on the Supplemental EAW cross-reference the original 2018 EAW comment and response using the numbering system in that document, for example Comment 1-1.

**SUPPLEMENTAL EAW COMMENTS**

**Comment 16-1:** Commenters wrote that the MPCA does not have legal authority to solicit or receive additional public comments on the EAW or the need for an EIS. Therefore, the MPCA may not consider any comment submitted during this second comment period and should base the EIS need decision on comments received during the initial comment period only. (1082, 1098, 1102, 1145, 1162)

**Response:** The MPCA has legal authority to solicit, receive, and consider public comments on environmental review worksheets under Minn. Stat. 116D and Minn. R. ch. 4410. The Minnesota Court of Appeals remanded the MPCA’s original Environmental Impact Statement (EIS) need decision back to the MPCA for consideration of GHG emissions. Because the MPCA provided new information regarding GHG not available in the 2018 EAW, a supplement with its own public notice and comment period is appropriate to support this consideration of new potential environmental effects.

**Comment 16-2:** Commenters wrote that the use of a population-based emission factor to estimate GHG emissions from Daley Farm’s proposed facilities is not accurate or scientifically valid. Emissions factors average information from groups of facilities that may be spread over large geographic areas and do not take into account emission reduction practices, or benefits of carbons sinks, on individual farms. (1082, 1098, 1102, 1142, 1145, 1162, 1173)

**Response:** An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. In most cases, these factors are simply averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category (i.e., a population average). It is common practice in developing air emission inventories for use in environmental review or air permitting to use emission factors developed on a national or regional level in lieu of actual monitored values for projects under environmental review. It is particularly method
used by the MPCA in developing the Supplemental EAW follows this practice. The MPCA environmental review process seeks to treat all facilities, facility-types, industries, and industry-types the same, with the same expectations and methods of analysis.

The Supplemental EAW acknowledges that the Daley Farms expansion would result in conversion of row crop agriculture to alfalfa and greater potential for cover crops, which provide climate benefits from enhanced soil carbon sequestration. The MPCA did not account for these reductions in its estimate of Project GHG emissions because the actions are not required as a permit condition in the Individual National Pollutant Discharge Elimination System (NPDES) Feedlot Permit. Also see responses to comments 16-13, 16-15, 16-18 and 16-21.

Comment 16-3: Commenters wrote that using CO₂-equivalence is not appropriate for biogenic methane emissions from livestock as it does not accurately assess the impact of short-lived climate pollutants (619, 1082, 1102, 1145, 1162, 1166)

Response: It is conventional for most scientific analyses of the effect of different industrial, energy-use, agricultural policies or technical measures to use the radiative forcing-based Global Warming Potential (GWP) construct, first developed by the IPCC in 1994, in expressing emissions of different GHGs in terms of a common metric of effect. In the Intergovernmental Panel on Climate Change (IPCC) construct, this is done relative to the effect of CO₂ on the earth’s energy balance. Starting with a pulse emission of some GHG, the IPCC construct gives you the amount of energy trapped in the lower atmosphere by that gas over some predetermined period of time, usually 100 years, as a percent of the energy trapped as a result of a similar pulse of CO₂ over a similar integration period. Using this framework, it is possible to express the emission of any non-CO₂ GHG in terms of the amount of emitted CO₂ necessary to produce an equivalent effect on the earth’s radiative budget, making emissions of different species of GHGs comparable and additive.

Virtually all GHG emission inventories, nationally and internationally, are developed using the IPCC radiative forcing-based approach, as are most scientific analyses involving GHGs. This has been true for the last 25 years, since the framework was first developed in the early 1990s.

Criticisms of the IPCC GWP construct go back to the early 2000s, and a number of competing constructs have been offered in the last 15 to 20 years, including constructs that rely on time-integrated change in surface temperature (Global Temperature Change Potential), as opposed to integrated change in total system radiative forcing. For various reasons, the scientific community has been loath to jettison the IPCC GWP construct. Thus, for instance, under 2016 Paris Climate Accords, all international reporting for purposes of compliance is done using the IPCC radiative forcing-based GWP construct. The same is true for the reporting under the earlier 1992 UN Framework Convention on Climate Change, of which the U.S. is a signatory.

To stay within the scientific mainstream, in developing the Supplemental EAW, the MPCA uses this dominant GWP framework.

Comment 16-4: Commenters wrote that the MPCA’s approach to the Daley EAW/GHG emissions is haphazard and confusing to project proposers and the public as it changed the rules in the middle of the game. Return to using existing regulations or develop new guidance. (1082, 1098, 1102)

Response: The MPCA was required to revisit the Daley Farms environmental review based on the October 14, 2019, Minnesota Court of Appeals decision that reversed and remanded the EIS order for further proceedings due to the MPCA’s failure to consider the potential significant environmental effects from GHGs.
The Environmental Quality Board (EQB) is working to determine how climate change is incorporated into environmental review throughout state agencies, but this process will likely take several months to complete, and, therefore, could not be used to support the Daley Farms analysis. After developing the GHG assessment for Daley Farms, the MPCA has decided to include similar evaluation for all feedlot EAWs going forward. Once EQB guidance is final, the MPCA will evaluate its approach for feedlot EAWs and incorporate any changes needed to ensure consistency of approach and quality of analysis.

**Comment 16-5:** Commenters wrote that dairy production in the U.S. is more efficient than other parts of the world, producing more milk from fewer cows, thereby reducing the number of cows, and thus the total amount of GHG emissions, globally. (738, 764, 1082, 1102, 1105, 1145, 1162)

**Response:** The GHG calculation evaluated the potential GHG emissions only as estimates and did not consider all GHG emissions globally that the Project could possibly create, induce, or offset. While providing more efficient cows may produce less emissions globally if global milk demand remained the same, the MPCA did not consider this because variations in milk supply and demand, cow efficiencies, and global numbers of cows are outside the scope of the Project.

**Comment 16-6:** Commenters wrote that the MPCA should account for the reductions in cows from other places (such as in Winona County or Minnesota) in its assessment of GHG since climate change affects the entire globe. (678, 729, 916, 1087, 1105, 1107, 1142, 1173)

**Response:** The GHG calculation evaluated the potential GHG emissions only as estimates and did not consider all GHG emissions that the Project could create, induce, or offset. While reductions in the number of cows locally or globally may offset GHG emissions from the Project’s proposed increase in cows, the MPCA did not consider this because that evaluation is outside the scope of the Project.

**Comment 16-7:** Commenter wrote that the MPCA should have included GHG mitigation measures that could be implemented in its Supplemental EAW, even if Daley Farms has no intention of taking such measures. (1084, 1141, 1144)

**Response:** It is environmental review standard practice to only describe in an EAW those mitigation measures a project proposer plans to implement and that the MPCA is reasonably confident will occur. The EAW is based on readily available information and is not intended to be an exhaustive document or research paper. An in-depth analysis the commenters are asking for is more suitable within an EIS rather than an EAW. However, the MPCA is required to determine the need for an EIS based on the criteria outlined in Minn. R. 4410.1700, subp. 7, and does not require an EIS simply to do more analysis.

**Comment 16-8:** Commenters asks that the MPCA use latest global warming values determined by the Intergovernmental Panel on Climate Change. (1137, 1144)

**Response:** It is a general convention, nationally and internationally, to use the 100-year GWPs found in the IPCC 2007 version in the development of the GHG analysis. While some scientists have begun using the 2013 IPCC version of these 100-year GWPs, for consistency across scientific analyses, most scientists continue to use the 2007 version. In its state-level GHG emissions reporting to the Legislature under the Next Generation Energy Act [https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data](https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data), the MPCA also uses the 100-year GWPs found in the 2007 IPCC scientific assessment, as well in its policy analysis of mitigation options (for example [https://www.pca.state.mn.us/sites/default/files/p-gen4-19.pdf](https://www.pca.state.mn.us/sites/default/files/p-gen4-19.pdf)).
The MPCA uses the 2007 IPCC 100-year GWP in the Supplemental EAW to maintain consistency with present MPCA practice, and to remain firmly within the scientific mainstream on issues of CO₂-equivalence and choice of GWP integration period.

**Comment 16-9:** Commenters ask that the MPCA evaluate GHG emissions at both 20 and 100 year time horizons. (1137, 1086, 1151, 1170)

**Response:** It is a general convention, nationally and internationally, to use the 100-year GWPs found in the IPCC 2007 version in the development of GHG analysis. While some scientists have begun using the 2013 IPCC version of these 100-year GWPs, for consistency across scientific analyses, most scientists continue to use the 2007 version. In its state-level GHG emissions reporting to the Legislature under the Next Generation Energy Act [https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data](https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data), the MPCA also uses the 100-year GWPs found in the 2007 IPCC scientific assessment, as well in its policy analysis of mitigation options (for example [https://www.pca.state.mn.us/sites/default/files/p-gen4-19.pdf](https://www.pca.state.mn.us/sites/default/files/p-gen4-19.pdf)).

Criticisms of the GWP construct go back to the early 2000s, and a number of alternative constructions have been offered over the last roughly 15 years. For various reasons, the scientific community has been loath to jettison the GWP construct in favor of any of these alternatives, either in national GHG reporting or analysis.

The same is true of the use of the 100-year GWPs, which are used, for instance, in all U.S. greenhouse gas reporting under the UN Framework Convention on Climate Change. [https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks](https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks). The use of the 100-year integration period reflects society's determination, dating back to the early 1990s, that, in formulating policy responses, a 100-year time horizon for effects is most appropriate for use.

The MPCA uses the 100-year GWP in the Supplemental EAW to maintain consistency with present MPCA practice, and to remain firmly within the scientific mainstream on issues of CO₂-equivalence and choice of GWP integration period. Because of this, in our judgment, a second facility carbon footprint for the Daley Farms Project, calculated using 20-year GWPs, would not provide the reader with useful additional information.

It might be noted that the choice of GWP integration period is a direct reflection of the time period over which society feels most consequential with respects to impacts and policy interventions, as well as its valuation of the near and the distant future (and of generations of human beings of the immediate future, as opposed to generations far distant into the future).

Most analysis show that, rather than being concentrated in the next 20 years, most effects of climate change are likely to be experienced in the 50-year period after 2050, and overwhelmingly by emissions of long-lived GHGs like CO₂. Because of this, the MPCA does not believe that there is a basis in the distribution of climate change effects across time to justify the selection of a 20-year GWP integration time.

On any heightened valuation of welfare over the next 20 years (as against that of the more distant future), the MPCA is equally uncomfortable with this proposition. The MPCA sees no basis in science for such unequal treatment of generations proximate in time to us or very distant in developing policy and weighting emissions for inventory purposes.

In the end, the principal intellectual hurdle to overcome in selecting a short GWP integration period, e.g., 20 years, is the long mean atmospheric lifetime of CO₂, which is estimated to be hundreds to thousands of years. This is in contrast to the atmospheric lifetime of methane, which is about 10 years. If it were to select a 20-year
GWP integration time, society would be weighting emissions to favor policy responses to emissions of very short atmospheric lifetimes at the partial expense of responses to the build-up of GHGs with atmospheric lifetimes of and impacts felt across hundreds to thousands of years. Given the extreme reach into the future of the effects of the long lived GHGs like CO$_2$, e.g., thousands of years, this does not seems reasonable.

**Comment 16-10:** Commenter asks that the MPCA use improved calculations of warming-equivalent emissions, such as GWP*/GWP-we, for short-lived climate pollutants like methane. (1137)

**Response:** It is a general convention, in use nationally and internationally, to use the 100-year global warming potentials found in the IPCC 2007 version in the development of GHG analysis. While some scientists have begun using the 2013 IPCC version of these 100-year GWPs, for consistency across scientific analyses, most scientists continue to use the 2007 version. In its state-level GHG emissions reporting to the Legislature under the Next Generation Energy Act [https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data](https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data), the MPCA also uses the 100-year GWPs found in the 2007 IPCC scientific assessment, as well in its policy analysis of mitigation options (for example [https://www.pca.state.mn.us/sites/default/files/p-gen4-19.pdf](https://www.pca.state.mn.us/sites/default/files/p-gen4-19.pdf)).

Criticisms of the GWP construct go back to the early 2000s, and a number of alternative constructions have been offered over the last roughly 15 years. For various reasons, the scientific community has been loath to jettison the GWP construct in favor of any of these alternatives, either in national GHG reporting or analysis.

The same is true of the use of the 100-year GWPs, which are used, for instance, in all U.S. greenhouse gas reporting under the UN Framework Convention on Climate Change. [https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks](https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks). The use of the 100-year integration period reflects society's determination, dating back to the early 1990s, that, in formulating policy responses, a 100-year time horizon for effects is most appropriate for use.

The MPCA uses the 100-year GWP in the Supplemental EAW to maintain consistency with present MPCA practice, and to remain firmly within the scientific mainstream on issues of CO$_2$-equivalence and choice of GWP integration period. Because of this, in our judgment, a second facility carbon footprint for the Daley Farms Project, calculated using 20-year GWPs, would not provide useful additional information for the purpose of environmental review.

**Comment 16-11:** Commenters wrote that the Supplemental EAW did not include an evaluation on the effects of climate change, such as increased storm events causing manure storage basin overflows or increased pollutant runoff from manure application, on the project itself. (1025, 1109, 1125, 1126, 1140, 1141, 1144, 1163, 1167, 1170)

**Response:** Potential climate change impacts on the Project are accounted for in various ways, such as project design, best management practices (BMPs), and other requirements imposed by statutes and rules.

Rule and permit language is periodically updated to account for new information or policy decisions. To meet rule and permit requirements, regulated parties must design structures based on the most recent data from the National Oceanic and Atmospheric Administration (NOAA). NOAA regularly updates its data based on changing weather and precipitation patterns. BMPs for the land application of manure, including the BMPs being utilized for the Daley Farm Project, are developed and updated based upon the latest research, which includes analysis of increased rainfall or severe storm events. The intent of the EAW is not to examine the effectiveness of BMPs but to discuss the Project and its consistency with rule and permit language that require the use of BMPs.
As discussed in the 2018 EAW at section 8, Daley Farm will have an Emergency Response Plan that describes required procedures for addressing all exceptional and catastrophic events. The Emergency Response Plan will become an enforceable condition of the Feedlot Permit upon issuance. In addition, pursuant to Minn. Stat. § 115.061, the Permittee shall notify the agency immediately of any discharge, accidental or otherwise, of any substance or material under its control which, if not recovered, may cause pollution of waters of the state, and the responsible person shall recover as rapidly and as thoroughly as possible such substance or material and take immediately action as may be reasonably possible to minimize or abate pollution of waters of the state caused thereby.

Because NOAA regularly updates data based on changing weather and precipitation patterns, and because Minnesota statutes requires response to exceptional and catastrophic events, potential climate change impacts on the Project have been reasonably accounted for and addressed.

Also see 2019 Findings responses to comments 6-2, 6-4, 8-5, and 8-8.

**Comment 16-12:** Commenter asks if the MPCA will ask Daley Farms to use solar power and wind turbines. (619)

**Response:** The MPCA does not have the authority through environmental review process to require the use of solar power or wind turbines.

Also, the comment is beyond the scope of the EAW because the information on this issue would not inform a reasoned decision about the potential for or significance of the environmental effects of the Project under Minn. R. 4410.1700.

**Comment 16-13:** Commenters asks that the MPCA require farming practices such as pasture-based dairies, regenerative agriculture, or the 21 agricultural BMPs identified in the October 2019 MPCA report, *Greenhouse gas reduction potential of agricultural best management practices*. (641, 643-661, 663-666, 668-677, 679-682, 684, 686-690, 692, 694-702, 704, 705, 707-709, 711, 728, 744, 753, 912, 1106, 1109, 1115, 1125, 1139, 1141, 1153, 1163, 1170, 1175)

**Response:** The MPCA does not have the authority through environmental review process to require specific farming practices.

**Comment 16-14:** Commenters state that the Supplemental EAW needs to include mitigation measures to offset 100% of Project-generated GHG emissions. (641, 643-661, 663-666, 668-677, 679-682, 684, 686-690, 692, 694-702, 704, 705, 707-709, 711, 728, 735, 744, 753)

**Response:** The MPCA environmental review process is intended to assess the potential environmental effects of a project; it is an information-gathering process, not a regulatory/enforcement process. The MPCA is unable to require specific mitigation actions through its environmental review process.

**Comment 16-15:** Commenters state that the MPCA must require GHG mitigation measures in the Feedlot Permit. (641, 643-661, 663-666, 668-677, 679-682, 684, 686-690, 692,694-702, 704,705, 707-709, 711, 728, 744, 753, 912, 1018, 1107, 1141)

**Response:** There are no state or federal air quality or performance standards for GHGs, or other regulatory requirements that would prescribe limits to GHG emissions from feedlots. As is true of all regulation, if standards are established in the future that apply to Daley Farms, it will be required to comply with them. At
such time, the Individual NPDES Feedlot Permit would be modified, or another type of permit required to include future applicable requirements.

In addition, Daley agreed to additional BMPs to further protect water quality. Some of these BMPs also provide benefits to GHG mitigation.

**Comment 16-16:** Commenters state that the MPCA will never require an EIS based on GHG emissions, no matter the quantity of GHG generations. (641, 643-661, 663-666, 668-677, 679-682, 684, 686-690, 692, 694-702, 704, 705, 707-709, 711, 728, 744, 753)

**Response:** The Minnesota rules for environmental review do not have an established threshold for GHG emissions triggering a mandatory EIS. The need for an EIS is not based on GHG emissions, rather the potential for significant environmental effects. The MPCA is required to evaluate a project based on the four criteria outlined in Minn. R. 4410.1700, subp. 7. These criteria do not exclude the possibility that GHG emissions from a project could be determined to cause significant environmental effects and necessitate preparation of an EIS.

**Comment 16-17:** Commenters state that the MPCA failed to provide detailed assessment of GHG mitigations, and some state that the MPCA must order an EIS because of the absence of detailed mitigation assessment. (912, 1018, 1085, 1141, 1144)

**Response:** The Supplemental EAW discusses activities that mitigate GHG emissions, such as agricultural BMPs like planting cover crops or converting fields from row crops to alfalfa, which sequesters carbon into the soil. Daley anticipates 850 acres of alfalfa would be needed for the Project, and the MPCA estimates a reduction of 1,000 tons of CO₂e per year if the alfalfa comes from fields currently planted in row crop agriculture. The MPCA did not include these GHG emission reductions in the Project’s GHG emission calculation because they are not required by Individual NPDES Feedlot Permit or other regulation. Also see response to comment 16-7.

**Comment 16-18:** Commenters state that the Supplemental EAW should have included a full GHG life-cycle analysis. (712, 726, 727, 734, 893, 909, 939, 1088, 1107, 1109, 1125, 1141)

**Response:** The MPCA acknowledged in the Supplemental EAW the constraints in developing a full life-cycle analysis of GHG emissions for any project due to complexities of global climate, operational and site-specific factors, and local geography, among other items referenced. In addition, the Supplemental EAW explains that the potential GHG emissions are estimates and do not consider all GHG emissions that the Project could possibly create, induce, or offset. The MPCA applied its technical expertise and experience with GHG emissions inventories and existing MPCA environmental review practices to determine which Project-related activities to quantify. The MPCA quantified the sources listed in the Supplemental EAW because they are within the scope of the Project and these are the sources MPCA uses to estimate GHG emissions for the entire agricultural sector on a statewide basis, and the U.S. Environmental Protection Agency (EPA) provides emission factors for these sources.

**Comment 16-19:** Commenters state that the GHG calculations were unsubstantiated because baseline factors such as weather events, humidity, and temperature were not provided in the Supplemental EAW. (712, 726, 727, 734, 893, 909, 939)

**Response:** Project GHG emissions are estimated using the EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks (2018), and the GWP values are derived from the Intergovernmental Panel on Climate Change Fifth Assessment Report. Baseline factors are provided within these resources. Also, see response to comment 16-2.
Comment 16-20: Commenters state that the Supplemental EAW statement, “The Project will release air and odor emissions typically associated with dairy farm” is faulty because the Project is larger than a typical Minnesota dairy that has fewer than 200 cows. (712, 726, 727, 734, 893, 909, 939, 1085, 1125, 1141)

Response: The MPCA acknowledges the Daley Farms expansion would contain more cows than the average Minnesota dairy. However, the statement referenced above was meant to introduce the sources of air and odor emissions, not the quantity of emissions. The Project has operational and design features to avoid and minimize adverse air and odor emissions and the air emission modeling results predict compliance with the hydrogen sulfide air quality standard, no exceedances of the subchronic hydrogen sulfide inhalation health risk values (iHRV), no exceedances of the acute ammonia iHRV, and no exceedances of chronic ammonia iHRV.

Comment 16-21: Commenters stated that the GHG mitigation measures are vague and not maintainable. For example Daley will have no control of the spreading of manure on land owned by others. (712, 732, 831, 912, 1018, 1117, 1144)

Response: See responses to comment 16-17 and 16-28.

Comment 16-22: Commenter stated that the MPCA should require Daley Farms to compost their manure to reduce the risk to air and water. (718)

Response: In order to compost liquid manure, a farmer needs to add a significant amount of organic material to it. Farms may then compost this material or can compost solid manure through a full compost process under Minn. Stat. 7020.2150. However, Minnesota laws do not require a farmer to compost generated manure. Once manure has gone through the full compost process, the MPCA no longer regulates the material as manure as it is considered a soil amendment/fertilizer that is regulated by the Minnesota Department of Agriculture.

No matter if a farmer composts manure or not, the end result is land application. So composting is really just a “processing” step in the utilization of the nutrients in the manure.

Comment 16-23: Commenters ask that the MPCA consider a moratorium on new and expanding confined animal feeding operations (CAFOs). (742, 743, 1085, 1166)

Response: The MPCA does not have the authority through environmental review process to implement a moratorium on CAFOs.

Comment 16-24: Commenters ask that the MPCA put a cap on the size of CAFOs. (1004, 1023)

Response: The MPCA does not have the authority through environmental review process to implement a cap on the size of CAFOs.

Comment 16-25: Commenters ask if the MPCA has evidence that the Project would have any measurable impact on climate change. (747, 1105)

Response: Using linked global and also regional models of atmospheric GHG retention, climate and of natural and human systems, it is possible to evaluate the effects of a small marginal change in emission of GHGs. These linked models were used by the Minnesota Public Utilities Commission to develop damage-cost estimates (externality values) for the next marginal ton of CO₂ or other GHG emitted to the atmosphere from power generation. From the linked models, it is possible to back out the underlying response of the climate to marginal
changes in emissions, miniscule as they may be on a per ton basis, as well as damages or impacts, usually monetized.

Having said that, because the effects of the additional GHG emissions from the Daley Farms expansion on global climate would be very small in relative terms, they likely would be undetectable amidst the noise or interannual variability of the climate system. These effects remain real, as demonstrated by proven physics, but outside of modeling, and probably would be impossible to extract from the observational evidence of the workings of the climate system.

So the Daley Farms GHG emission increases would have an effect that can be demonstrated based on the best available current science, but as a matter of observational measurement, that effect probably cannot be extracted from empirical evidence of the operation of the climate system.

Comment 16-26: Commenters ask what the MPCA receives for supporting the Project. (748)

Response: The MPCA does not support or oppose feedlots, or any other proposed project, but must regulate feedlots through the permitting process following Minn. Stat. 7020, and conducts environmental review of feedlot projects following Minn. R. 4410.

Comment 16-27: Commenters ask how many cows the MPCA thinks can be housed in one location without having problematic effects on the environment, not to mention the cows. (748)

Response: The MPCA evaluates the potential for significant environmental effects on a case-by-case basis, and does not have established thresholds or caps of animal units allowed for environmental review projects stated in Minnesota Rule. Also, see response to comment 16-24.

Comment 16-28: Commenters state that industrial farm operations self-reporting is not working and that the MPCA should monitor all manure spreading and install monitoring wells around fields receiving manure and around the facility. (767)

Response: The MPCA regulates the spreading of manure through Minnesota Rule and the Individual NPDES Feedlot Permit. The rules and permit are designed to protect Minnesota groundwater and surface waters and are based on University of Minnesota Extension Service recommendations. Requirements include monitoring, recordkeeping, and reporting. The requirements relating to manure application apply not only to the feedlot owner, but also anyone receiving manure from the Project. As explained in the original 2018 EAW at section 5.D., Daley will provide all manure recipients a description of the minimum state requirements for manure application as required by Minn. R. 7020.2225, supb. 1.D., and the most current manure nutrient analysis. Daley’s Individual NPDES Feedlot Permit application includes a manure Management Plan (MMP), which is updated annually, describing how manure from the Project will be applied at agronomic rates. The MPCA reviewed the submitted MMP, including verifying that adequate land base is available for manure that will be generated from the feedlot, and found it meets Minn. R. ch. 7020 and Individual NPDES Feedlot Permit requirements.

The MPCA does not have the resources to be physically present for all manure applications, and the MPCA does not have the authority to require monitoring wells around all fields receiving manure applications.
Comment 16-29: Commenter asks that officials conduct groundwater studies that show where and how fast contaminants reach groundwater before permitting, so that officials can notify citizens of a spill in a timely way. (767)

Response: The EAW is defined by state statute as a “brief document which is designed to set out the basic facts necessary to determine whether an EIS is required for a proposed action” (Minn. Stat. § 116D.04 Subd. 1a). The EAW form consists of 20 questions that provide the information needed to determine if the Project will have significant environmental impacts as outlined in Minn. R. 4410.1200. The type of groundwater study mentioned is outside the bounds of issues to be considered during the environmental review process and is not required for the Individual NPDES Feedlot Permit.

Comment 16-30: Commenters ask that details of violations be available to the public in a timely way (not over 2 years later). (767)

Response: Details of violations that are a part of an enforcement investigation are available to the public once the enforcement case is complete and it becomes public information as described in State regulations. This includes the Minnesota Government Data Practices Act and Chapter 13 of Minnesota statutes (Minn. Stat. § 13.01, subd. 3 and Minn. Stat. § 13.02, subd. 7). Information about how this data can be requested from the MPCA is here: https://www.pca.state.mn.us/about-mpca/information-requests.

Comment 16-31: Commenter asks why Daley Farms is out of compliance and how much money would it take to bring them into compliance. (828)

Response: Comments on the compliance status of a project proposer are outside the scope of the EAW process. EAWs are limited to analyzing the potential environmental effects of a project in order to determine whether an EIS is required.

The cost of compliance activities is beyond the scope of the EAW because the information on this issue would not inform a reasoned decision about the potential for or significance of the environmental effects of the Project under Minn. R. 4410.1700. Also, see response to comment 11-2.

Comment 16-32: Commenters ask “How many pandemics are we risking by overcrowding our animals.” (874)

Response: Project proposers typically use the Midwest Plan Service guidance on space needs for livestock when designing barns. However, there is no rule or permit requirement to do so. Animal spacing within a barn is outside the scope of the EAW process. EAWs are limited to analyzing the potential environmental effects of a project in order to determine whether an EIS is required.

Comment 16-33: Commenter asks that the MPCA promote legislative support for geological surveys of southeast Minnesota counties, easily understood interpretations of resources and training to governmental and agricultural groups so well-informed decisions may be made. (940)

Response: The comment is noted, but is outside the scope of environmental review.

Comment 16-34: Commenter provides recent studies that evaluate human health problems associated with drinking nitrate-contaminated water and question the safety of the Minnesota Department of Health (MDH) drinking water standard. (1025, 1042, 1157)
Response: Minn. R. ch. 7020 contains specific requirements for locating, constructing, and operating feedlot facilities in Minnesota. The requirements found in rules are designed to protect Minnesota surface water and groundwater. The Project complies with these rules. The MDH establishes drinking water standards that the MPCA considers in its environmental review process. The commenters may want to contact the MDH with their concerns regarding the level of protectiveness of the drinking water standard.

Comment 16-35: Commenter asks that the MPCA consider the project’s GHG emissions in terms of Minnesota’s climate goals. (1084, 1141, 1168)

Response: If achieved under the GHG reduction goals of the Next Generation Energy Act, state-level GHG emissions would decline by 30% from 2005 levels by 2025 and by 80% by 2050. An additional 15% reduction goal was established for 2015. Using the 2005 baseline reported in the most recent MPCA report to the State Legislature, emissions between 2015 and 2025 would need to decline roughly 2.6 million short CO₂-equivalent tons each year and between 2025 and 2050 3.5 million CO₂-equivalent short tons per year. It is important to note that the Next Generation Energy Act targets are state-wide reduction goals, not project-specific mandatory thresholds/requirements, with progress measured across sectors and the economy as a whole. Even for those sectors currently achieving reduction targets (i.e., the power sector), individual sources’ reductions or even emissions increases vary.

As a percentage of state-level emissions, the net emission increase that is projected to occur as a result of the Daley Farm expansion would be 0.01%.

Comment 16-36: Commenter states that the MPCA did not provide the calculation method used to derive annual CO₂-equivalent emissions, nor cite EPA reference on this method. (1086, 1123)

Response: Calculation methods were provided in Attachment W of the Supplemental EAW. The first column contains letters that represent the item described in the next column. Calculations are shown with the representative letters. For example, CH4 – flatulence is calculated by A*B*C, where A is animal inventory (head), B is kg CH4/head/yr (EPA) and C is conversion to tons/head/year.

The equations used to estimate emissions of CH4 from enteric fermentation (described as “flatulence” in the example above) and manure storage and N₂O from manure storage and manure land application are taken from EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks (2018) and the GWP values are from the Intergovernmental Panel on Climate Change Fifth Assessment Report. Methane and N₂O are converted to CO₂-equivalent by multiplying their totals by their GWP value, provided in the upper right side of Attachment W of the Supplemental EAW.

Comment 16-37: Commenters asks if the MPCA will be monitoring GHG at the facility and if so with what equipment and protocol, and how will the public be able to access the monitoring data. (1088, 1107, 1109, 1125, 1141, 1144, 1163, 1170)

Response: The MPCA will not be requiring monitoring of GHG emissions at the facility as there is no regulatory requirement to do so.

Comment 16-38: Commenter states that the Supplemental EAW’s calculation of nitrous oxide emissions from manure application is likely too low because often farms apply at rates that exceed the Natural Resource Conservation Service nutrient management criteria. (1088, 1141)
Response: The Project proposers have filed a MMP with the MPCA, with proposed rates of manure application that are within agronomic guidelines, as given in the most recent published recommendations of the University of Minnesota Extension Service or from another land grant college in a contiguous state. The MPCA has no reason to question the intention of the Project proposers to adhere to the particulars of the plan.

Regarding accelerated N₂O emissions from applied nitrogen that is surplus to plant needs, there has been a lively debate in the scientific literature on these issues, dating back to the mid-2000s. Some researchers have suggested an exponential rise in the rate of emission with nitrogen applications once plant nutrient needs are met. Others have found no such post-plant need acceleration in the rate of emissions.

In its guidelines for emissions estimation, the IPCC recommends a constant percentage rate of emission with each additional unit of nitrogen application, with no acceleration in the rate of increase once plant nutritional needs are met. The IPCC guidelines are based on meta-analyses of data from existing studies in the published literature.

Note there was a calculation error for nitrous oxide emissions from land application in the Supplemental EAW, see the Errata Sheet (appendix F).

Comment 16-39: Commenter states that the Supplemental EAW should have included GHG emissions from project construction. (1141)

Response: See response to comment 16-18.

Comment 16-40: Commenter writes, “Another weakness of the Daley Farms Supplemental EAW is that it counts methane emissions on a 100-year timeframe, which underestimates the operation’s climate impact. Methane has a shorter atmospheric lifetime than carbon dioxide, persisting in the atmosphere for only 12.4 years. By comparison, carbon dioxide persists in the atmosphere for hundreds of years. Given its 17 shorter lifetime and the extreme urgency of climate change, methane should be compared to carbon dioxide over a 20-year timeframe, not a 100-year timeframe. When calculated on this shorter timeframe, methane has a global warming potential of 84 which is considerably higher than the Supplemental EAW’s estimated global warming potential for methane of 25. MPCA must use the most recent science in this analysis, and that means counting methane on a more appropriate 20-year timeframe.” (1141)

Response: See response to comment 16-9.

Comment 16-41: Commenters write about concerns over the economics of dairy farming and the project. (1141, 1164, 1168, 1169)

Response: Economic comments are beyond the scope of the EAW because the information on this issue would not inform a reasoned decision about the potential for or significance of the environmental effects of the Project under Minn. R. 4410.1700.

Comment 16-42: Commenters state concern with the MPCA overall response to comments in the previous Findings of Fact issued January 4, 2019, and that MPCA dismissed many citizen comments with the phrase “beyond the scope” of an EAW, but feels these concerns are within the scope of an EIS. (1140)

Response: The purpose of the EAW process is to disclose information about potential environmental impacts of a Project. The EAW is defined by state statute as a “brief document which is designed to set out the basic facts
necessary to determine whether an EIS is required for a proposed action” (Minn. Stat. § 116D.04 Subd. 1a). The EAW form consists of 20 questions focusing on potential environmental effects, and these questions generally provide the information needed to determine if the Project will have significant environmental impacts as outlined in Minn. R. 4410.1200. Minnesota’s environmental review process does not require analysis of social and human health effects, such as quality of life, financial burden of well disputes, economic impacts, animal cruelty, etc., as part of the EAW process. While these issues are beyond the scope and intent of the EAW process, they may be discussed in an EIS if the MPCA Commissioner determines there is a need for an EIS due to the potential for significant environmental effects from a project.

**Comment 16-43:** Commenter states that some comments previously submitted on the previous EAW issued on October 1, 2018, are inaccurate or partially missing (comment #10 missing the back page of her hand-written comment and comment #190 submitted by Kevin is duplicated and also shown in the row for comment #191 which is allegedly supposed to be from Mike Buringa but is clearly signed by Kevin Schmitz). (1140)

**Response:** MPCA staff reviewed the response letters received on the 2018 EAW. The backside of comment letter 10 was accidentally omitted from the 2019 Findings. The MPCA has added the missing page of comment letter 10 to the official record. The MPCA acknowledges that comment letters 190 and 191 are duplicate comments submitted through our website. The MPCA received the comments as shown in the 2019 Findings. It cannot be determined how the issue occurred and therefore it cannot be rectified.

**Comment 16-44:** Commenter states that section 10 of the Supplemental EAW is incorrect because it references the October 1, 2018, EAW that states an animal unit cap variance’s status is “To be applied for.” However, Daley had applied for this variance at the time of the Supplemental EAW issuance. (1140)

**Response:** The MPCA agrees that at the time of the Supplemental EAW Public Notice, Daley Farms had applied for the animal unit cap variance. This error is documented in the Errata Sheet, available as Attachment F.

**Comment 16-45:** Commenter states that the MPCA must postpone the decision on the need for an EIS to obtain missing information necessary to make a reasoned decision, or must make a positive declaration on the need for an EIS. (1144)

**Response:** The Commissioner of the MPCA will make the determination on if there is any necessary information lacking in the record after carefully reviewing all the information in the EAW, Supplemental EAW, written public comments, and the Response to Comments. Upon reviewing all of the available information, should the Commissioner determine “that information necessary to a reasoned decision about the potential for, or significance of, one or more possible environmental impacts is lacking, but could be reasonably obtained,” shall either “A. make a positive declaration and include within the scope of the EIS appropriate studies to obtain the lacking information; or B. postpone the decision on the need for an EIS, for not more than 30 days or such other period of time as agreed upon by the RGU and proposer, in order to obtain the lacking information.” (Minn. R. 4410.1700 subp. 2a.)

Also see discussion within the Cumulative Potential Effects section of the Supplemental Findings of Fact, Conclusions of Law and Order.

**Comment 16-46:** Commenter requests that its comments on the original EAW, submitted on November 15, 2018, be incorporated into the current record into the comments provided below. (1144)
Response: The MPCA determined the Daley Farms Project did not have the potential for significant effects and provided the rational for this decision in the 2019 Findings. The Minnesota Court of Appeals’ decision based on challenges of the MPCA’s negative declaration for the need for an EIS found no error in all accounts except for the MPCA’s response to the Project’s greenhouse gas (GHG). The MPCA is therefore only addressing new comments related to GHG emissions in this document. The 2019 Findings, to which this document is an appendix, incorporate in whole by reference the 2019 Findings thereby incorporating the commenter’s previous comments, and the MPCA’s responses, in the current record.

Comment 16-47: Commenter asked that the MPCA look to guidance on how to conduct a GHG and climate change analysis from EQB’s national equivalent [Council of Environmental Quality (CEQ)] and other guidance and tools when it considers how to conduct such an analysis in Minnesota. (1144)

Response: The MPCA Environmental Review staff worked with the MPCA’s internal GHG specialists, who are familiar with the now-withdrawn CEQ guidance, to develop an EAW-appropriate GHG analysis to include in the Supplemental EAW. A number of guidances, models, and methodologies were considered. The MPCA made a determination that the methodology used in the Supplemental EAW was appropriate for an EAW-level analysis of GHG emissions to make a determination on the significance of the environmental impacts by GHGs emitted by the Project.

Comment 16-48: Commenter asks for the rational for not ordering an EIS given the study by Minnesota Chief Geologist Anthony Runkel that nitrate levels in deeper aquifers are shown to be increasing and if continuing at the current rate will rise above 10 mg/L within 10 years. (1088)

Response: Given the conditions imposed in the Feedlot Permit, MPCA does not expect the Daley Farms Project to add additional nitrates to surface or groundwater.

Separate from the Daley Farms Project, the MPCA, in consultation with the EQB, asked the Minnesota Legislature to allocate funds for an updated feedlot General Environmental Impact Statement (GEIS). No funds were made available for the effort. In the absence of dedicated funds, the MPCA, in partnership with other state agencies, has continued work to advance the important science called for in the GEIS request. Ongoing efforts include such items as improvements and implementation of the State Nutrient Reduction Strategy, the Minnesota Agricultural Water Quality Certification program, the Groundwater Protection Rule, and the Nitrogen Fertilizer Management Plan.

RESPONSES TO THESE COMMENTS MAY BE FOUND IN THE 2019 FINDINGS AND RTC TO 2018 EAW

OVERALL PROJECT COMMENTS

Comment 1-1: Commenters support the Project. (678, 691, 693, 729, 730, 733, 738, 740, 746, 749, 751, 764, 765, 768, 773, 809, 827, 914, 916, 926, 956, 1092, 1095, 1096, 1105, 1142, 1159, 1173)

Comment 1-2: Commenters oppose the Project. (623, 712, 714, 715, 719, 720, 721, 724, 737, 741, 756, 760, 763, 767, 770, 771, 778, 779, 785, 794, 801, 863, 865, 884, 890, 894, 900, 904, 930, 999, 1011)

Comment 1-4: Commenters request the MPCA deny or reject the Project. (625, 626, 627, 629, 630, 631, 637, 639, 667, 685, 717, 721, 725, 734, 736, 737, 750, 752, 754, 757, 761, 763, 776, 783, 785, 786, 789, 791, 792, 797, 800, 805, 806, 807, 808, 811, 815, 817, 821, 824, 831, 833, 835, 836, 838, 840, 842, 843, 846, 847, 853, 856, 858, 859, 862, 866, 868, 869, 870, 871, 876, 878, 879, 882, 883, 886, 888, 889, 893, 895, 901, 904, 905, 907, 908, 910, 912, 918, 920, 921, 922, 923, 925, 928, 931, 933, 934, 936, 937, 938, 942, 943, 944, 946, 950, 954, 955, 957, 962-966, 968-973, 975, 976, 978, 982, 986, 987, 990, 993, 997, 998, 1000, 1001, 1002, 1003, 1008, 1017, 1024, 1026, 1028, 1029, 1030, 1033, 1035, 1036, 1039, 1042, 1046, 1062, 1076, 1077, 1078, 1080, 1089, 1090, 1091, 1093, 1099, 1100, 1101, 1109, 1113, 1116, 1117, 1118, 1123, 1128, 1130, 1138, 1140, 1147, 1148, 1149, 1151, 1152, 1154, 1155, 1157, 1160, 1161, 1163, 1171)

Comment 1-5: Commenters have concern that the Project will reduce their quality of life. (632, 734, 782, 850, 1030, 1149)

Comment 1-7: Commenters ask that no EIS be required. (768)

COMMENTS CONCERNING WINONA COUNTY REGULATIONS

Comment 2-1: Commenters state that the EAW should not proceed since Winona County has an animal unit (AU) cap that the Project would exceed. (818, 1010)

Comment 2-2: Commenters state that Daley’s existing operations exceed the Winona County AU cap. (791, 830, 1011, 1030)

KARST GEOLOGY COMMENTS

Comment 3-1: Commenters question the safety of the proposed project in light of the Lewiston municipal pond failure and other pond failures due to karst geology. (628, 754, 1008, 1149)

Comment 3-2: Commenters question the safety of the proposed project in an area with karst geology. (628, 636, 642, 706, 716, 732, 736, 739, 748, 760, 761, 763, 772, 775, 776, 778, 780, 791, 793, 795, 796, 799, 802, 804, 808, 810, 812, 814, 816, 818, 823, 831, 832, 840, 841, 843, 846, 848, 859, 860, 863, 867, 870, 871, 882, 886, 889, 895, 899, 905, 915, 918, 919, 923, 924, 929, 931, 932, 934, 937, 943, 958, 969, 970, 983, 984, 990, 1000, 1006, 1007, 1008, 1013, 1016, 1019, 1025, 1028, 1030, 1038, 1042, 1074,
GROUNDWATER AND WELL COMMENTS

Comment 4-1: Commenters state concern that the Project will contaminate groundwater. (620, 621, 623, 628, 632, 636, 706, 716, 721, 722, 723, 725, 734, 739, 754, 763, 769, 772, 775, 778, 786, 787, 790, 792, 811, 825, 826, 830, 831, 846, 849, 851, 859, 860, 862, 863, 878, 881, 885, 900, 905, 911, 913, 915, 918, 921, 944, 1000, 1025, 1030, 1038, 1040, 1044, 1045, 1046, 1049, 1051, 1053, 1065, 1072, 1074, 1075, 1077, 1078, 1086, 1088, 1094, 1101, 1114, 1120, 1126, 1130, 1147, 1150, 1155, 1158, 1160, 1164, 1169)

Comment 4-2: Commenters state concern that well water is already unsafe. (625, 626, 627, 628, 706, 710, 723, 725, 726, 727, 736, 734, 739, 741, 745, 748, 754, 755, 756, 757, 762, 766, 772, 778, 780, 786, 790, 793, 805, 806, 810, 816, 818, 829, 830, 831, 832, 843, 851, 859, 860, 863, 867, 876, 877, 893, 899, 900, 909, 910, 918, 928, 937, 939, 946, 954, 966, 969, 978, 990, 1000, 1003, 1007, 1012, 1018, 1019, 1024, 1025, 1038, 1042, 1057, 1058, 1063, 1072, 1075, 1076, 1077, 1078, 1083, 1086, 1091, 1099, 1104, 1108, 1113, 1117, 1121, 1122, 1124, 1127, 1140, 1164, 1166, 1167, 1169, 1174, 1175)

Comment 4-3: Commenters state concern that the Project will cause water shortages in nearby wells. (763, 792, 831, 841, 924, 934, 1076, 1086)

Comment 4-6: Commenter states that when nitrates are found in drinking water, follow up tests often show that the same wells and aquifers are contaminated with pesticides, and that the EAW does not address pesticide measurement and mitigation. (632)

Comment 4-12: Commenter asks who pays for cleaning up polluted groundwater. (769)

SURFACE WATER COMMENTS

Comment 5-1: Commenters state concern that the Project will contaminate surface water. (620, 621, 623, 632, 716, 721, 734, 770, 775, 781, 787, 792, 825, 826, 849, 860, 862, 863, 878, 881, 913, 921, 1039, 1046, 1053, 1065, 1147, 1160)

LAND APPLICATION OF MANURE COMMENTS

Comment 7-7: Commenter states, “USDA Natural Resources Conservation Service studies indicate that 200/250 cows produce as much nitrogen as 5,000 people. The impact of this increase in nitrogen load must be fully analyzed though an EIS.” (1117)

Comment 7-23: Commenter asks how the MPCA will ensure manure land application BMPs are followed to protect public and private wells. (745)

EMERGENCIES, SPILLS, AND CLIMATE CHANGE COMMENTS

Comment 8-1: Commenters state concern that the manure pits will leak or fail. (807, 1030)
Comment 8-3: Commenter asks how damage would be undone and how much time might restoration take if there was a manure pit catastrophic failure. (619)

Comment 8-10: Commenters state concern that the manure basin is not adequately equipped to handle more intense rainfall events, brought on by climate change. (725)

AIR EMISSIONS AND ODOR COMMENTS

Comment 10-1: Commenters state concern about the odors emitted from the Project. (620, 632, 713, 736, 761, 763, 770, 782, 804, 826, 850, 866, 885, 895, 983, 984, 1085, 1101, 1151)

Comment 10-2: Commenters state concern about the air emissions from the Project. (620, 621, 632, 716, 725, 736, 761, 770, 775, 778, 787, 793, 806, 816, 825, 826, 866, 881, 892, 915, 917, 918, 932, 983, 984, 990, 1044, 1048, 1049, 1053, 1058, 1063, 1065, 1077, 1094, 1101, 1147, 1155, 1160, 1164, 1169)

COMPLIANCE AND ENFORCEMENT COMMENTS

Comment 11-2: Commenters ask why MPCA oversight and enforcement should be trusted when the MPCA has for years had full awareness of active noncompliance with the zero discharge requirement at Daley existing operations. (726, 727, 734, 748, 830, 840, 893, 898, 909, 939, 946, 1088)

Comment 11-4: Commenter asks why there are not governmental agencies taking enforcement action over farming operations that apply too much nitrogen in the form of commercial fertilizers. (805)

Comment 11-5: Commenter states that the MPCA should not issue permits when history of the operation shows continued violations. (806)

Comment 11-6: Commenter states that the MPCA has not conducted proper monitoring of Daley Farms (1088)

ECONOMIC IMPACT COMMENTS

Comment 12-1: Commenter states information about the history and future of dairy operations, and the positive economic impact from dairy operations. (740)

Comment 12-2: Commenters state that the economic impacts of the operations needs to be analyzed, including the impacts to neighboring family-owned and moderate-sized dairy farms. (762, 830, 959)

Comment 12-5: Commenter states concern that the Project will reduce real estate values. (632)

HEALTH IMPACT COMMENTS

Comment 13-1: Commenters state concern over antibiotics use in the project and antibiotic resistance development. (721)
AGRICULTURAL PRACTICE COMMENTS

**Comment 14-1:** Commenters state concern that the Project is too big. (620, 621, 634, 635, 713, 715, 716, 724, 731, 739, 745, 748, 775, 776, 777, 780, 784, 788, 789, 790, 791, 795, 796, 799, 800, 807, 811, 812, 819, 826, 829, 830, 833, 834, 837, 839, 840, 848, 851, 852, 854, 855, 858, 864, 866, 871, 876, 879, 884, 886, 888, 889, 892, 896, 898, 902, 903, 904, 906, 911, 917, 920, 927, 928, 930, 944, 947, 953, 959, 962, 966, 972, 974, 975, 984, 992, 995, 996, 997, 1006, 1009, 1015, 1021, 1022, 1023, 1024, 1026, 1030, 1039, 1057, 1063, 1064, 1078, 1091, 1093, 1127, 1146, 1166)

**Comment 14-6:** Commenter asks why a waste water treatment plant isn’t required to treat the animal waste. (824)

**Comment 14-7:** Commenter states that dairies are immoral. (770)

**Comment 14-8:** Commenters state that the Project promotes animal cruelty. (632, 713, 750, 770, 789, 959, 992, 1166)

MISCELLANEOUS COMMENTS

**Comment 15-1:** Commenter asks who is financially responsible for cleaning up contamination if the business goes under. (619)

**Comment 15-7:** Commenter states that dairy is detrimental to human health. (632)

**Comment 15-18:** Commenter asks what the average mortality rate for a dairy farm in Minnesota is and how does that compare to Daley’s project mortality rate. (619, 828)
Minneapolis Pollution Control Agency

Daley Farms of Lewiston, LLP – 2018 Dairy Expansion
Supplemental EAW

ERRATA SHEET

1. The Supplemental Environmental Assessment Worksheet (EAW) contained a calculation error for nitrous oxide emissions produced from manure land application. This error resulted in an undercounting of emissions. The following chart shows the corrected values. Note the chart shows all emission without any rounding.

The table and Supplemental EAW discussion use the emission source “flatulence.” However, cows also produce methane emissions from belches and cud-chewing, collectively a result of the digestion of feed. Therefore, the Supplemental EAW should have used the term “enteric fermentation.”

<table>
<thead>
<tr>
<th>Emission Type and Source</th>
<th>Existing Facility (tons CO$_2$-e/yr)</th>
<th>Project Increase (tons CO$_2$-e/yr)</th>
<th>Total – after Project Construction (tons CO$_2$-e/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$_2$O - manure storage</td>
<td>644</td>
<td>1,049</td>
<td>1,693</td>
</tr>
<tr>
<td>CH$_4$ - manure storage</td>
<td>4,496</td>
<td>7,195</td>
<td>11,691</td>
</tr>
<tr>
<td>CH$_4$ – flatulence enteric fermentation</td>
<td>6,701</td>
<td>11,668</td>
<td>18,369</td>
</tr>
<tr>
<td>N$_2$O - manure land application</td>
<td>300</td>
<td>1,025</td>
<td>400</td>
</tr>
</tbody>
</table>

**ESTIMATED TOTAL:** 12,100 12,867 20,300 21,580 32,500* 34,447

*Note: Table values were rounded to the nearest hundred tons. Because of differences in rounding, the total – after Project construction does not match the rounded sum of the existing facility plus project increase.

2. Supplemental EAW item 10. Permits and approvals required (page 6) should have stated that the animal unit cap variance status changed from “To be applied for” to “Applied for.”
<table>
<thead>
<tr>
<th>Existing facility</th>
<th>Proposed changes</th>
<th>Totals after construction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>CH4</td>
</tr>
<tr>
<td>CO2-e</td>
<td>12,887</td>
<td>1,025</td>
</tr>
<tr>
<td>CH4 - Baseline</td>
<td>12,887</td>
<td>1,025</td>
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<tr>
<td>CH4 - manure storage</td>
<td>5,701</td>
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<tr>
<td>CH4 - carbon storage</td>
<td>4,198</td>
<td>5,682</td>
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<td>CH4 - manure and carbon storage</td>
<td>9,769</td>
<td>9,880</td>
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<td>N2O - manure storage</td>
<td>844</td>
<td>844</td>
</tr>
<tr>
<td>N2O - carbon storage</td>
<td>844</td>
<td>844</td>
</tr>
<tr>
<td>N2O - manure and carbon storage</td>
<td>1,688</td>
<td>1,688</td>
</tr>
<tr>
<td>Total CO2-e</td>
<td>12,887</td>
<td>1,025</td>
</tr>
</tbody>
</table>

**Note:** For the E4N, round the total CO2-e to the nearest 100 ton.
STATE OF MINNESOTA
MINNESOTA POLLUTION CONTROL AGENCY

IN THE MATTER OF THE DENIAL OF A CONTESTED
CASE HEARING REQUEST AND MODIFICATION OF A
NOTICE OF COVERAGE UNDER INDIVIDUAL NATIONAL POLLUTION DISCHARGE ELIMINATION
SYSTEM FEEDLOT PERMIT NO. MN0067652 FOR THE PROPOSED EXPANSION OF DALEY FARMS OF LEWISTON, LLP, DALEY FARMS OF LEWISTON LLP1 AND DALEY FARMS OF LEWISTON LLP7 SECTION 16, UTICA TOWNSHIP WINONA COUNTY, MINNESOTA

Based on Minnesota Pollution Control Agency (MPCA) staff review, comments and information received during the comment period, and other information in the record of the MPCA, the MPCA hereby makes the following Findings of Fact, Conclusions of Law, and Order:

FINDINGS OF FACT

Project Description

1. Daley Farms of Lewiston, LLP (Daley) proposes to expand its existing dairy feedlot in Section 16 of Utica Township, Winona County (Project). The existing feedlot consists of three sites, regulated under the State of Minnesota Individual Animal Feedlot National Pollution Discharge Elimination System (NPDES) Permit MN0067652 (Feedlot Permit).
   - LLP site, a 1,996.4 animal unit (AU) total confinement barns
   - LLP1 site, a 140 AU partial confinement barn and concrete lot without runoff control
   - LLP7 site, a 138.8 AU partial confinement barn and concrete lot without runoff control

2. The Project consists of the following items at the LLP site.
   - Adding a cross-vented, total confinement freestall barn with 3,000 dairy cows
   - Eliminating 525 dairy cows and adding 525 heifers to the existing barns
   - Adding a liquid manure storage area (LMSA)
   - Adding stormwater basins to collect the new barn stormwater runoff
   - Adding a rotary milking parlor with a holding area
   - Adding a sand processing and storage building
   - Adding an animal mortality building
   - Adding a feed storage pad
   - Adding a basin to collect feed storage pad stormwater runoff
   - Installing two livestock wells

3. The Project also consists of eliminating the LLP1 site, and adding open-lot runoff controls at the LLP7 site. Daley will add open-lot runoff controls, required to eliminate runoff from animal lots in order to create zero discharge from LLP7 site, in accordance with the Feedlot Permit Schedule of Compliance.
4. The Project would result in the feedlot increasing from 2,275.2 AU to 5,967.7 AU.

5. The Project would generate approximately 46.2 million gallons of manure annually, and 1.7 million gallons of runoff from the feed storage pad.

6. Daley will utilize the manure on its own fields, and fields owned by third parties who have entered into agreements with Daley.

7. Daley will land apply or hire a commercial animal waste technician (CAWT) to land apply manure to cropland according to the MPCA approved manure management plan (MMP).


9. Daley plans to construct the Project once environmental review is complete, and all necessary permits and approvals are granted.

PROCEDURAL HISTORY

Public Notices and Comment Periods for Feedlot Permit for Daley Farms of Lewiston, LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7

10. On October 1, 2018, pursuant to Minn. R. 7001.0100, the MPCA issued a public notice of intent to modify coverage under the NPDES Individual Feedlot Permit for the construction of an expansion and operation at the Proposer's Daley Farms of Lewiston LLP feedlot site. The public comment period was open for comment from October 1, 2018, through November 15, 2018.

11. Public notice documents were available for review throughout the public comment period on the MPCA website at http://www.pca.state.mn.us/index.php/public-notices/list.html.

12. The MPCA met all applicable public notice requirements for the issuance of an NPDES Permit.

Public Notice and Comment Period for the Environmental Assessment Worksheets for Feedlot Permit for Daley Farms of Lewiston, LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7

13. Pursuant to Minn. R. ch. 4410, the MPCA prepared an Environmental Assessment Worksheet (EAW) assessing impacts for Feedlot Permit for Daley Farms of Lewiston, LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7.

14. Meeting the requirements of Minn. R. 4410.1500, the MPCA provided notice of the EAW in the October 1, 2018, Environmental Quality (EQB) EQB Monitor; made the EAW available for review on the MPCA website at http://pca.state.mn.us/news/eaw/indexJ1trnJ; and provided a news release on the EAW to media in Minnesota and other interested parties, on October 1, 2018. At the time of submission of the EAW to EQB, the MPCA also submitted copies of the EAW to all entities listed in Minn. R. 4410.1500, subp. A.

15. The MPCA provided public notice of the Project as follows:
   a. The EQB published the Notice of Availability of the EAW for public comment in the EQB Monitor on October 1, 2018, as required by Minn. R. 4410.1500.
   b. The EAW was available for review on the MPCA website at: http://www.pca.state.mn.us/news/eaw/index.html.
c. The MPCA provided a news release to media in Minnesota and other interested parties on October 1, 2018.
d. Daley’s draft Feedlot Permit was open for public comment on October 1, 2018.
e. On October 11, 2018, the MPCA extended both the EAW and Feedlot Permit comment period until November 15, 2018.
f. The MPCA provided a news release to the media in Minnesota and other interested parties on October 12, 2018, announcing the extension of the public comment periods.
g. The EBQ announced the extension of the public comment period in the EQB Monitor on October 22, 2018.

16. The MPCA met all applicable public notice requirements for the EAW.

17. The MPCA has prepared separate Findings of Fact, Conclusions of Law, and Order for the EAW.

18. During the 45-day comment period ending on November 15, 2018, the MPCA received 615 comment letters and 6 late comment letters received after November 15, 2018, on the EAW and the Feedlot Permit. The late comment letters, which are not included in the record, did not include any new information.

Five commenters requested contested case hearings. Four of the requests did not meet criteria to be a valid request. One request was determined to be a valid request, indicating the concern that the draft permit for the Project and the Proposer's MMP do not meet requirements of the Clean Water Act and State Law.

19. The list of the comments received during the 45-day public comment period are included as Appendix A, which is contained within Appendix D to these Findings.

20. The MPCA prepared written responses to the comments received during the 45-day public comment period. These responses are included as Appendix B, which is contained within Appendix D to these Findings.

21. In response to comments received while on public notice, on December 23, 2018, the Project Proposer submitted an addendum to its MMP. The addendum included additional manure application management practices that will be implemented and additional notifications that will be made during LMSA construction.

22. In response to comments received while on public notice and the MMP addendum submitted by the Project Proposer on December 23, 2018, the 2019 Permit for the Project included additional requirements that were not part of the Draft Permit open for public comment from October 1, 2018 to November 15, 2018. The additional requirements were relating to manure management and notifications for LMSA construction.

23. The additional requirements added to the Proposer’s MMP and the 2019 Permit were not substantial requiring re-public notice of the permit.

24. The Proposer’s addendum to the MMP are in Appendix H of these findings.
25. In the matter of the decision on the need for an Environmental Impact Statement (EIS) for the proposed Daley Farms of Lewiston, LLP Project, on January 4, 2019, MPCA determined that there were not potential significant environmental effects and there was no need for an EIS.

26. In the matter of the denial of a Contested Case Hearing Request (CCHR) and Modification of a Notice of Coverage under Individual National Pollution Discharge Elimination System Feedlot Permit No. MN0067652, for the proposed Daley Farms of Lewiston, LLP Project, on January 4, 2019, MPCA determined that the issues raised by the CCHR did not meet the requirements of Minn. R. 7000.1800, subp. 2(A) and Minn. R. 7000.1900, subp. 1(a) for granting a contested case hearing and the contested case hearing was denied.

27. Subsequent to the MPCA’s EIS determination and issuance of the 2019 Permit, an appeal was filed challenging the MPCA’s decisions on the need for an EIS and approval of the permit modification. On October 14, 2019, the Minnesota Court of Appeals reversed and remanded the MPCA’s EIS order because the agency failed to consider potential significant environmental effects from greenhouse gases (GHGs). The court also invalidated the MPCA’s approval of the NPDES permit modification because a determination on whether an EIS is needed must precede a decision to approve a permit modification.

28. On January 21, 2020, pursuant to Minn. R. 7001.0100, the MPCA issued an additional public notice of intent to modify coverage under the NPDES Individual Feedlot Permit for the construction of an expansion and operation at the proposer’s Daley Farms of Lewiston, LLP feedlot site. On February 5, 2020 the MPCA extended the public comment period. The public comment period was open for comment from January 21, 2020, through March 6, 2020.

The additional public notice specifically noted that all comments received during the October 1, 2018, through November 15, 2018, comment period will be included in the record for the Feedlot Permit and did not need to be resubmitted. The MPCA met all applicable public notice requirements for the issuance of an NPDES Permit.

29. Public notice documents were available for review throughout the public comment period on the MPCA website at http://www.pca.state.mn.us/index.php/public-notices/list.html

Public Notice and Comment Period for the Environmental Assessment Worksheets and Public Notice and Comment Period for the Supplement to the original Environmental Assessment Worksheet for Feedlot Permit for Daley Farms of Lewiston, LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7

30. Following the court decision and Pursuant to Minn. R. ch. 4410, the MPCA prepared a supplement to the original Environmental Assessment Worksheet (Supplemental EAW) for the Daley Farms of Lewiston, LLP Project. The Supplemental EAW evaluates GHG emissions related to the Project.

31. The MPCA provided public notice of the Project as follows:

a. The EQB published the notice of availability of the Supplemental EAW for public comment in the EQB Monitor on January 21, 2020, as required by Minn. R. 4410.1500.
b. The Supplemental EAW was available for review on the MPCA website at:

c. The MPCA provided a news release to media in Minnesota and other interested parties on January 21, 2020.

d. Daley’s draft Feedlot Permit was open for public comment on January 21, 2020.

e. On February 5, 2020, the MPCA extended both the Supplemental EAW and Feedlot Permit comment periods until March 6, 2020.

f. The MPCA provided a news release to the media in Minnesota and other interested parties on February 4, 2020, announcing the extension of the public comment periods.

g. The EBQ announced the extension of the public comment period in the *EQB Monitor* on February 10, 2020.

32. The MPCA met all applicable public notice requirements for the Supplemental EAW.

33. The MPCA has prepared separate Findings of Fact, Conclusions of Law, and Order for the Supplemental EAW.

34. During the 45-day comment period ending on March 6, 2020, the MPCA received 550 comment letters on the Supplemental EAW and 13 comment letters on the Feedlot Permit.

   One commenter, the Minnesota Center for Environmental Advocacy (MCEA), requested a contested case hearing. The request was determined to be a valid request, indicating the concerns that the Project’s proposed application rates exceed agronomic rates and MMP fails to apply proper manure crediting, the special conditions developed by the agency to limit nitrate leaching were not adequate, some of the Project’s manure application fields should be eliminated for manure application and that nitrate monitoring and testing should be required.

35. The list of the comments received regarding the Feedlot Permit during the additional 45-day public comment period are included as Appendix I to these Findings.

36. The MPCA prepared written responses to the comments received regarding the Feedlot Permit during the additional 45-day public comment period. Response to comments that were part of MCEA’s CCHR have been incorporated into this FOF. Responses for the other comments that were received are included as Appendix J to these Findings.

**EVALUATION OF THE REQUESTS FOR A CONTESTED CASE HEARING**

37. During the October 1, 2018, through November 15, 2018, public notice period for the MPCA’s intent to issue coverage under the Individual NPDES Feedlot Permit, the MPCA received one request for a contested case hearing from MCEA.

38. Following the unpublished court of appeals opinion and during the subsequent second public comment period (January 21, 2020, through March 6, 2020), the MPCA received another request for a contested case from MCEA.
39. Minn. R. 7000.1800, subp. 2(A) sets out the requirements of a petition for a contested case hearing. A petition must include:
   • A statement of reasons or proposed findings supporting a Board or Commissioner decision to hold a contested case hearing pursuant to the criteria in part 7000.1900, subpart 1.
   • A statement of the issues proposed to be addressed by a contested case hearing and the specific relief requested or resolution of the matter.

40. Minn. R. 7000.1800, subp. 2(8) states:
To the extent known by the petitioner, a petition for a contested case hearing may also include the following information
   (1) A proposed list of prospective witnesses to be called at the hearing, including experts, with a brief description of the testimony they will provide.
   (2) A proposed list of publications, references, or studies that the petitioner would introduce at the hearing.
   (3) An estimate of the time required for the petitioner to present the case at a hearing.

41. The MPCA notes that while the information specified in Minn. R. 7000.1800, subp. 2(8) is not required in a contested case hearing petition; it is information that is helpful to the MPCA as it considers whether a hearing will aid the Board or Commissioner in making a final decision.

42. The MPCA decision on whether to grant the petition is governed by Minn. R. 7000.1900 subp. 1, which states:
The Board or Commissioner must grant the petition to hold a contested case hearing or order upon its own motion that a contested case hearing be held if it finds that:
   A. There is a material issue of fact in dispute concerning the matter pending before the Board or Commissioner.
   B. The Board or Commissioner has the jurisdiction to make a determination on the disputed material issue of fact.
   C. There is a reasonable basis underlying the disputed material issue of fact or facts such that the holding of a contested case hearing would allow the introduction of information that would aid the Board or Commissioner in resolving the disputed facts in making a final decision on the matter.

43. In order to satisfy the first criterion, Minn. R. 7000.1900, subp. 1(A), the hearing requester must show there is a material issue of fact in dispute as opposed to a disputed issue of law or policy. A fact is material if its resolution will affect the outcome of the case. O'Malley v. Ulland Brothers, 540 N.W.2d 889,892 (Minn. 1996)

44. In order to satisfy the second criterion, Minn. R. 7000.1900, subp. 1(B), the requester must show that the MPCA has jurisdiction or authority to make a determination on the disputed issues of material fact. "Agencies are not permitted to act outside the jurisdictional boundaries of their enabling act." Cable Communications Board v. Nor-West Cable, 356 N.W.2d 658, 668 (Minn. 1984). Therefore, each issue in the contested case request has to be such that it is within the MPCA's authority to resolve.
45. Finally, under Minn. R. 7000.1900, subp. l(l), "[t]he petitioners for a contested case hearing have the burden of demonstrating the existence of material facts that would aid the [Agency] in making a decision before they are entitled to a contested case hearing." Matter of Solid Waste Permit for the NSP Red Wing Ash Disposal Facility, 421 N.W.2d 398,404 (Minn. Ct. App. 1988). The Minnesota Supreme Court has recognized that to meet this standard, "[i]t is simply not enough to raise questions or pose alternatives without some showing that evidence can be produced which is contrary to the action proposed by the (Agency)." In the Matter of Amendment No. 4 to Air Emission Facility Permit, 454 N.W.2d 427,430 (Minn. 1990).

46. The MPCA evaluated the first request for a contested case hearing by examining each of the issues raised in the petition received at that time, to determine if the petition met each of the three required criteria in Minn. R. 7000.1900, subp. 1. The MPCA findings for that CCHR can be found in Appendix D to these Findings.

47. The MPCA also evaluated the second request for a contested case hearing by examining each of the issues raised in the petition received, to determine if the petition met each of the three required criteria in Minn. R. 7000.1900, subp. 1. The MPCA findings for the second CCHR are found below.

**THE MPCA FINDINGS WITH RESPECT TO EACH OF THESE CRITERIA**

48. The MPCA finds that the CCHR submitted by MCEA was timely submitted prior to the close of the public comment period.

49. The MCEA CCHR requests that the MPCA deny the NPDES permit for the Daley expansion. The petition also requests that the MPCA refer the disputed issues of material fact to the Office of Administrative Hearings for resolution in a contested case hearing if the MPCA does not deny the application.

50. In general, MCEA appears to be using the contested case hearing process as a vehicle to voice its concern with MPCA policies and application of rule provisions, specifically land application of manure within Minnesota’s karst region. MCEA does not argue that the conditions of this permit fail to protect the environment but rather that MPCA policy and applicable laws do not go far enough to provide the level of environmental protection they believe is warranted. In other words, MCEA is questioning the effective implementation of laws, rules, and regulations by the MPCA. As stated above, a contested case hearing process is used to settle disputed facts about the particular project seeking permit coverage. A contested case hearing is not used to dispute MPCA’s policies or application/implementation of current laws, rules, or regulations.

MCEA’s CCHR submittal also includes some questions about the permit language and implementation of permit conditions, of which are more typical of general comments about the permit and not part of a CCHR document. The MPCA believes that MCEA has incorporated its CCHR and comments on the permit language into one document. For that reason, the MPCA will also respond to the general comments and questions about the permit language within the CCHR.
51. The MCEA CCHR identifies four (4) reasons for a contested case hearing. The MPCA’s findings regarding each of these reasons are as follows.

**Issue #1: The proposed application rate within the Project’s Manure Management Plan (“MMP”) exceeds the agronomic rate and the MMP fails to apply proper manure crediting:**

The requestor states that the MMP does not comply with the most recent nitrogen recommendations of the University of Minnesota (U of M) as required by Minn. R. 7020.2225.

The requestor correctly notes that there is a citation to the U of M’s 2001 recommendations within the Project’s MMP, and the 2001 document is not the current recommendation. The citation is an error originating from MPCA-developed software that was used to create the MMP for this Project. The software program does in fact use the most current U of M recommendations and is not based on yield goal for corn crop production. On the Methodology – Nutrients page the citation covers all crops that could potentially be grown so while it is correct for other crops it is incorrect for corn production. The MPCA will update its software to remove the outdated reference for corn identified by MCEA.

Additionally, it appears that the Table A - Fertilizer Recommendations for Agronomic Crops in MN page provided with the MMP was a copy from a previous version of the software and not printed from the version identified on the first page of the software (V. 8.0 – last updated 4/16/18). Had the correct Table A been provided, it would have correctly identified that the recommendations for corn production had been updated for the changes made by the U of M in 2015 and 2016. This would have clearly indicated that the software was using the most current U of M recommendations when the MMP was developed. Even though the table provided was not accurate, it is evident from the crop and nutrient planning worksheet that the nitrogen recommendations (N Recommendation after 2016 crop credits column) is 180 lbs of available nitrogen for corn following corn crops. This was the current U of M recommendation when the MMP was developed.

Along those same lines, the MPCA would like to inform MCEA that it too is using outdated information regarding U of M crop nutrient recommendations. The U of M no longer prints hard copies of its crop nutrient recommendations, rather it simply publishes the recommendations on its website. The chart supplied by MCEA in its CCHR (taken from exhibit 4 of the CCHR) is outdated (published in 2011). In fact, the recommendations for corn production have changed twice since the publication used by MCEA in its CCHR was printed. The most recent published rates for corn production in Minnesota are as follows:
In the Matter of the Request for a Contested Case Hearing
Daley Farms of Lewiston, LLP – 2018 Dairy Expansion
Utica Township, Winona County, Minnesota

Findings of Fact
Conclusions of Law
And Order

Using the most current data, this results in a maximum application rate of 195 lb N/acre for a corn crop where the previous crop was corn and 150 lb N/acre for a corn crop where the previous crop was soybeans, not 155 lb N/acre (corn following corn) and 120 lb N/acre (corn following soybeans) as claimed by MCEA utilizing outdated material. The MMP for the Project does not identify application of nitrogen at rates that exceed the maximum return to nitrogen (MRTN) as determined using the most current data.

MCEA’s CCHR states that MPCA should use the MRTN value as its compliance threshold, and, in fact, MPCA does use the MRTN to determine the appropriate planned manure application rate.

The most recent U of M recommendations were developed for commercial fertilizers meaning that it is not directly amenable to use when manure is the nutrient source. The MPCA has developed and published its interpretation of the U of M recommendations when manure is the nutrient source. It can be found at [https://www.pca.state.mn.us/sites/default/files/wq-f8-18.pdf](https://www.pca.state.mn.us/sites/default/files/wq-f8-18.pdf). MCEA questions MPCA’s interpretation of how to implement the U of M recommendations when manure is the nutrient source; however, this is a question of policy rather than an issue of material fact to be determined at a contested case hearing.
Moreover, after the initial MMP development for this Project, the U of M published guidelines for manure application rates. They can be found at: https://extension.umn.edu/manure-land-application/manure-application-rates. Below is a chart from that publication which identifies the nitrogen recommendations for manure application (Note: PAN refers to plant available nitrogen).

<table>
<thead>
<tr>
<th>Crop prior to corn</th>
<th>Crop 2 years prior to corn</th>
<th>Suggested maximum lbs of PAN to apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn (or other non-legume crop)</td>
<td>Not applicable</td>
<td>195</td>
</tr>
<tr>
<td>Corn</td>
<td>Alfalfa (1-year-old stand)</td>
<td>120</td>
</tr>
<tr>
<td>Corn</td>
<td>Alfalfa (&gt;2-year-old stand)</td>
<td>80</td>
</tr>
<tr>
<td>Soybean</td>
<td>Not applicable</td>
<td>150</td>
</tr>
<tr>
<td>Alfalfa (1-year-old stand)</td>
<td>Not applicable</td>
<td>80</td>
</tr>
<tr>
<td>Alfalfa (&gt;2-year-old stand)</td>
<td>Not applicable</td>
<td>40</td>
</tr>
</tbody>
</table>

These recommendations, specific to manure applications, are identical to the MPCA requirements, which reinforces MPCA’s interpretation of U of M recommendations.

MCEA makes an assertion that the development of the U of M recommendations are heavily biased towards minimizing a farmer’s out-of-pocket expense for fertilizer and have little consideration for environmental protection. While the U of M recommendations are designed to minimize costs for a farmer, the underlying objective is to avoid applying excessive amounts of nitrogen. Applying excessive amounts of nitrogen means that not all nitrogen is utilized by the crop and therefore likely lost to the environment via nitrate leaching and other mechanisms. Therefore, although environmental considerations are not directly mentioned as a factor within the development of the U of M recommendations, implementation of the recommendations does result in environmental protection.

Furthermore, the MMP for this Project is simply following Minn. R. 7020.2225 subp. 3 that requires the use of U of M recommendations when determining the rate of manure application. MCEA’s assertion that those recommendations are not protective of the environment is a challenge to the existing rule language and not a disputed fact about this Project suitable for resolution through a contested case hearing.

MCEA also implies that the MMP fails to credit manure applications in previous years as required by Minn. R. 7020.2225.
MCEA erroneously utilizes a portion of the MMP (6-year soil P management plan) that strictly deals with compliance with phosphorus limits to draw conclusions about compliance with nitrogen applications. This portion of the MMP simply illustrates that it would be possible to apply manure at the identified rates and not build soil P over a 6 year period, hence the title of the worksheet, 6 year phosphorus management plan.

Instead of looking at the 6-year phosphorus management plan, MCEA should have been looking at the Crop and Nutrient Planning Worksheet and the Nutrient Application Planning Worksheet. These worksheets are where the manure application rate is determined by taking into account all the applicable variables, included credits for manure application the previous year. The Crop and Nutrient Planning Worksheet identifies the amount of credit required to be taken for manure application the previous year. These credits are then subtracted from the U of M recommendation, and the difference is recorded on the Nutrient Application Planning Worksheet in the N needs column. Thus, the Nutrient Application Planning Worksheet reflects values for “N needs” that are less than the U of M recommendations when there are credits applicable for previous manure applications. Therefore the MMP does account for credits from previous manure applications and is consistent with Minn. R. 7020.2225.

MCEA’s use of outdated crop nutrient recommendations and erroneous reliance on portions of the MMP that do not apply to nitrogen application are not disputed facts suitable for resolution through a contested case hearing.

Issue #2 The special conditions developed by the agency to limit nitrate leaching are inadequate.

MCEA cites Minn. R. 7001.1080, subp. 1., Minn. R. 7001.0150, subp. 2., and Minn. R. 7020.0225, subp. 4(D)(9), among others, to bolster its argument that special conditions are necessary for land application of manure from this Project. MCEA does not dispute that the MPCA has included special conditions in the permit for this Project but MCEA claims that the conditions developed are insufficient.

The application of these rules, specifically the adequacy of the special conditions, is a question of law rather than a disputed fact. Nonetheless, the MPCA offers the following response.

The special conditions MCEA is referring to were developed to address concerns with nitrate leaching from land application of manure. These conditions are found in part 7 of the permit. The special conditions within the permit were primarily developed by considering common nitrogen best management practices (BMPs) promoted by the U of M and its current research efforts. MCEA does not dispute that the conditions are based on current nitrogen BMPs and in fact acknowledges that the conditions developed can provide water quality benefits. MCEA contends that the BMPs do not provide enough protection if you do not also apply at the proper rate.

The first BMP is delaying manure applications in the fall until soil temperature is below 50 degrees. This BMP relies on research that indicates microbial activity necessary to convert the applied nitrogen to nitrate (the most leachable form) is greatly reduced at temperatures less than 50 degrees. Applying manure at this time presents less opportunity for nitrate leaching than applying
when soils are warmer. This is a current BMP for manure application promoted by the U of M through their website: https://extension.umn.edu/manure-land-application/manure-timing.

MCEA questions how the soil temperature requirement will be enforced. The MPCA has a long standing requirement in its NPDES Feedlot General Permit for coarse textured soils that mirrors this requirement. In fact that same requirement is within this permit. “The Permittee shall delay fall application onto fields that are dominated by coarse-textured soils until the soil temperatures in the upper six inches are less than 50 degrees.” The MPCA has consistently enforced this condition to mean that at the time of manure application the soil temperature must be below 50 degrees. The same application would be utilized for this permit condition. MCEAs suggestion to specify a date is not reliable. The exact date when soil temps drop to 50 degrees is weather dependent and variable yearly. The permit provides reference to a frequently updated data source (Minnesota Department of Agriculture soil temperature network) so that the yearly variability can be accounted for resulting in manure application each year at a time when soil temps are less than 50 degrees. Enforcement of this condition is accomplished via the required records that identify the soil temperature on the manure application date.

The second and third BMP includes the use of a nitrogen stabilizing additive to the manure when land applied. This BMP relies on various products that are developed to limit the microbial activity in the soil that would convert the applied nitrogen to nitrate. Nitrogen stabilizers are more common for use with commercial fertilizer applications, however some studies have indicated that they can provide a similar function when used with manure applications (Does Liquid Swine Manure Application Timing and Nitrapyrin Affect Corn Yield and Inorganic Soil Nitrogen?).

MCEA implies that the third BMP is limited only to a combination with the fourth BMP, a cover crop. The third BMP can also be utilized with the sixth BMP, split application of nutrients. The third BMP does not require application of all manure nutrients for the upcoming crop as MCEA suggests. It is entirely plausible that 90 or less pounds of available manure nitrogen is applied before soil temps are below 50, with the use of a nitrogen stabilizer (BMP 3), and the remainder of the nutrients are applied in the spring (BMP 6).

The fourth BMP involves planting a cover crop on fields that receive manure application. The use of cover crops has been promoted by the U of M as a way to limit nitrogen loses via uptake into growing vegetation. When the cover crop is planted it will use the readily available nitrogen in the soil as well as that which is converted by the soil microbes when soils are warm (50 degrees or more). This ties up the nitrogen within the plant tissue instead of leaving it in the soil profile susceptible to loses to the environment. U of M research (https://blog-crop-news.extension.umn.edu/2018/07/managing-manure-nitrogen-with-cover-crop.html) confirms that cover crops can reduce potential nitrate leaching by lowering the nitrate concentration in the soil profile.

MCEAs expert notes that “seeding a viable cover crop after Sept. 20 would be a risky practice with less potential for adequate growth, limiting uptake of nitrates from the mineralized manure, regardless of when the manure was applied.” The MPCA agrees that seeding a cover crop later in the fall does become more challenging. The Midwest Cover Crop Council – Cover Crop Decision Tool,
(http://mccc.msu.edu/covercroptool/covercroptool.php) indicates that winter rye, a common cover crop and excellent nitrogen scavenger, has a reliable seeding date past October 15 (estimated as October 22). Additionally, when discussing this issue with U of M cover crop specialists, they indicated that even if growth of green plant tissue above ground is limited, the formation of roots below the surface does provide some benefit for nitrate mitigation.

The use of cover crops not only benefit water quality by providing soil erosion control and minimizing potential for nitrate leaching. It will also offset some of the GHG emissions generated from the Project by either removing carbon from the atmosphere and sequestering it in the soil, or reducing the formation of methane or nitrous oxide.

The fifth and sixth BMP include spring application of manure instead of the typical fall application period for manure. Spring application of nitrogen is a U of M recommended BMP primarily for commercial fertilizers (Best Management Practices for Nitrogen Use in Southeastern Minnesota) due to the prevalence of nitrogen within the fertilizer being in a form that is susceptible to loss to the environment. While manure has some nitrogen in the same form as commercial fertilizer it also has a large portion of nitrogen that must be converted before it can be used by plants which also is the form that is more susceptible to losses. Spring application of manure will help prevent nitrogen losses by minimizing the time from land application to plant uptake of the portion of nitrogen in the manure that is most susceptible to loss.

MCEA questions the intent of the fifth BMP as written in the permit. The intent of this condition is that all of the manure be applied in the spring. The MPCA does not believe the addition of the qualifier “all”, as suggested by MCEA, is needed.

MCEA also asks, “If all manure is applied in the spring, must a stabilizer be added (BMP 2)?” No, a stabilizer would not be required as the option to avoid areas shallow to bedrock (BMP 7) would also be permissible.

The seventh BMP is avoiding fields where soil depth to bedrock is less than 40 inches. While not specifically recommended by the U of M, this BMP is intended to restrict manure application on areas of the field that would allow for more rapid transport of any nitrates to groundwater systems.

MCEA emphasizes that applying manure at the proper rate is the best BMP. The excerpts below are taken from the CCHR.

- “This evidence supports that only changes to the “rate” of application allowed under the manure management plan will have a significant impact on nitrate pollution from this project.” (page 14)
- “Based on the scientific research that has been conducted, only controlling the rate of application significantly reduces the threat of nitrogen pollution.” (page 17)
- “Dr. Randall also holds the opinion that the special conditions will do little to control nitrate pollution from the proposed application because the rate of application is the most significant factor, not source, timing, or method.” (page 17)
“Applying the proper agronomic rate of N is the most consistent BMP because it works each year and provides an additive effect over the years. If manure is applied at a rate exceeding the MRTN, nitrate-N levels in the soil profile will escalate because the N is being applied in excess of what the crop needs.” (page 20)

The MPCA agrees with MCEA that applying manure at the proper agronomic rate (i.e., the MRTN) is the best BMP for nitrate leaching mitigation. As outlined in the response to issue #1, the MMP is consistent with the most current published U of M recommended rates. The requirement that additional nitrogen BMPs (those summarized above) be employed further enhances the environmental protection that is achieved by applying manure in accordance with the MRTN as requested by MCEA.

MCEA also claims that, via internal staff discussions in the record, the “pick two” format of the permit language for nitrogen BMPs does not reflect the MPCA technical staff recommendations. To the contrary, when considering the complete discussion, it becomes evident that MPCA technical staff were advocating for a combination of practices to be used for this particular Project. As the records cited by MCEA confirms, MPCA technical staff concluded that more than one nitrogen BMP should be implemented for manure applications but did not conclude that the idea of the “pick two” format is insufficient. The portions selected by MCEA identify some potential combinations of BMPs that can be employed but does not represent the only “packages” that could be implemented.

As the MCEA expert identifies, there are challenges with implementing BMPs from one year to the next based on yearly weather fluctuations and field conditions. The MPCA agrees and offers that this is the very reason the permit requires implementation of two BMPs. In the event that one BMP is less effective in a given year the other BMP will likely provide some nitrate mitigation. The “pick two” menu allows flexibility to choose those that are the most desirable for the given circumstances at the time of manure application, rather than being locked into a “package” of BMPs.

Issue #3 Some fields are too risky for manure application and should be eliminated from the MMP.

MCEA presents its opinion that some identified land application sites are too risky and that it would be difficult to land apply manure in accordance with Minn. R. 7020.2225. MCEA contends that commercial applicators would have a difficult time applying manure to the fields given the irregularity of the field shapes due to topography and setback restrictions. Contested case hearings are not used to settle conjecture on the ability of a licensed individual/company to perform its job in a given setting but rather only disputed facts. Nonetheless the MPCA offers the following response.

The land within the MMP for the Project is substantially similar to other acres within the immediate area and most of south east Minnesota. The fields in this area are typically irregularly shaped and have varying slopes across the acreage. Commercial applicators apply manure to fields in south east Minnesota on a yearly basis in spite of fields being irregularly shaped and having varying slopes. Moreover, some of the land in the MMP is already receiving manure applications from the current Daley Farm operation, which further supports the notion that commercial applicators are able to apply manure to fields in this area.
MCEA also claims that the irregularity of the fields make it difficult to land apply in a uniform matter so as to apply at a rate consistent with the agronomic needs of the crop due to potential overlap of nutrient applications. MPCA agrees that applying manure to irregular shaped fields can be a challenging task; however, nearly all application of nutrients to fields in southeast Minnesota face the same challenges.

Any field in southeast Minnesota used to grow a corn crop under current crop production methods will receive nutrient applications, whether that be via manure application or commercial fertilizers. Commercial fertilizer application does not automatically ensure that there will be no overlap of nutrients applied. Both manure and commercial fertilizer is applied with large equipment that performs best when it is able to travel in straight lines on rectangular shaped fields. For instance, anhydrous ammonia, a popular nitrogen fertilizer, is applied via injection below the soil surface, which is the same method used for manure application. Anhydrous ammonia applications utilize a piece of equipment known as a “toolbar”, which is an implement pulled behind a tractor with shanks that extend into the ground and tubes behind the shanks then release the fertilizer into the soil surface. The primary method for manure application for this Project, injection, happens in an identical manner. This commercial fertilizer application would face the same uniform application challenges as the manure application via injection. No matter the source of the nutrients, application in a uniform matter is challenging given the inherent nature of the shape of farm fields in southeast Minnesota. Simply removing them from the MMP for this Project does not change the potential for environmental effects.

The MPCA is aware that sometimes a small overlap of nutrient application may occur due to the challenge of irregular shaped fields; however, the MPCA expects those instances to be minimal in size/scope and consistent with similar applications of other nutrient sources. In other words, the Project is within the reasonable implementation of Minn. R. 7020.2225 currently utilized by the MPCA. Implementation of Minn. R. 7020.2225 is a question of law or policy not a disputed fact suitable for resolution through a contested case hearing.

MCEA also incorrectly characterizes a couple of statements from the MPCA’s response to the MCEA’s 2018 CCHR. First MCEA claims that the MPCA agrees that manure application fields for the Project are “poor” (page 21 of the CCHR). The MPCA did not state that the application fields were poor but rather agreed with MCEA that the fields in the MMP are underlain by karst bedrock and are more susceptible to impacts from land application than those without that same geologic situation.

A second mischaracterization lies in the MCEA’s claim that the MPCA concluded “it would be better for the fields to be part of the Daley Farms MMP because otherwise these fields might receive manure applications from small producers who are not required to have a manure management plan.” (page 21) While it is correct that the MPCA does agree that it is better to have these land application acres in the MMP for this Project than not, the key point has nothing to do with the requirements on who is required to have a MMP. The key point of this statement and others like it in the findings is that there is increased regulation on those acres when they are included within the MMP for this permit. For instance, the nitrate BMPs included with the permit are only applicable if the acres are within the MMP for this Project. Those same BMPs would not apply if manure is applied from a different farm of the same, bigger, or smaller size. The BMPs are unique to this
permit and subsequent land application acreage. If the primary concern is impacts from nitrate leaching from manure application, it is better that these acres are being included within the MMP for this Project as without it, other manure applications to these acres would not be as restricted.

MCEA presents three maps from the MMP for the Project that identify setbacks for manure application. MCEA claims that the acreage listed in the MMP as available for manure application is grossly more than it deduces is eligible for land application when accounting for the setbacks identified on the maps. MCEA fails to consider the method of manure application when looking at these maps.

The setbacks identified on the map are those that would be applicable should surface application of manure without incorporation in 24 hours be utilized as the method to apply manure to the field. When manure is injected, or surface applied and incorporated within 24 hours, the setback to water features is greatly reduced or eliminated in some instances. The MMP for the Project indicates that injection is the planned method of manure application. The common practice of the consultant that prepared the maps is to outline the full 300 foot setback out of an abundance of caution in the event that manure is not able to be injected as planned.

Since, the MMP for the Project indicates that injection is the planned method of manure application, a majority of the areas on the maps can be used for manure application. Thus the acreage listed in the MMP as available for manure application is accurate when you consider the method of application.

MCEA makes a count of the number of sensitive features within fields identified in the MMP (i.e., shallow bedrock, sinkholes, intermittent streams, steep slopes, etc.) and notes that some of the soils test “very high” for phosphorus. The MPCA does not dispute that there are sensitive features within the acreage, nor does it dispute the phosphorus test results. The MPCA has verified that the fields meet the requirements of 7020.2225 in regards to setbacks and that the MMP meets the requirements for management of soil phosphorus levels. MCEA recommends that some fields be removed from the MMP because they are too “risky”, not because they fail to meet the requirements of Minn. R. 7020.2225. The MPCA agrees that “risk” varies from field to field as no two fields are exactly the same; however, the concept of risk is not a factual dispute suitable for resolution through a contested case hearing.

MCEA concludes this issue by claiming that the agronomic rate requirement is meaningless if manure cannot be applied practically on the field or when land application is performed on “risky” fields. As discussed above, the practicality of manure application is no different than other fields in the area and the challenges of uniform application of nutrients will be similar whether the source is manure or commercial fertilizer. The MPCA has also verified that the MMP and the manure application fields meet the requirements of Minn. R. 7020.2225. The concept of “risk” is a question of law/policy on the sufficiency of Minn. R. 7020 and the implementation of general authorities of Minnesota laws, rules, and statutes that guide the MPCA to provide environmental protection.
The question of whether it is possible to comply with all applicable manure application conditions on each of the fields included in the MMP requires MPCA to make a determination based on technical judgment and expertise; these are not factual disputes suitable for resolution through a contested case hearing.

**Issue #4 The MPCA must require nitrate monitoring and testing.**

MCEA claims that under Minn. R. 7001.0150, subp. 2.B, nitrate testing is required. The applicability of Minn. R. 7001.0150, subp. 2.B is a question of law, not a disputed material fact. Nonetheless the MPCA offers the following response.

The soil nitrate test is intended to be used to determine commercial fertilizer application rates when commercial nitrogen is applied in the spring (pre-plant) or early in the crop growth cycle. The citations used in the MCEA CCHR on pages 28 and 29 all are discussing the use of the test in the spring prior to crop planting (pre-plant). There is no spring application of manure planned for this Project, rendering the spring pre-plant test useless for manure application decisions.

Moreover, even if some spring pre-plant fertilizer is planned as part of the overall nutrient application in conjunction with fall manure application, the soil nitrate test is not to be used when manure is applied in the previous fall.

The U of M publication on the soil nitrate test (also included as exhibit 13 in the CCHR), does provide some good guidance on this issue through the following statements:

- **Under the Study Results heading** - “The direct correlation between yield response to N and soil N test wasn’t as strong as desired, but subsequent calculations led to a strong correlation between soil nitrate-N at preplant time and unaccounted N using the traditional recommendations (i.e., without using a soil test).” (emphasis added)

- **Under the Manure Applications heading** - “While the perception is that the most recent manure applications (year of or year after application) would best be reflected by the soil N test, research experience indicates that the residual effects – two, three or four years after application – are best-quantified by this new test.” (emphasis added)

- **Under the Oct. 1 to Dec. 1 heading** - “If you applied manure the previous fall between Oct. 1 and Dec. 1, you can’t use the soil N test or the manure N worksheet credit system.” (emphasis added)

- **Under the Oct. 1 to Dec. 1 heading** - “In contrast, only using the spring soil N test to credit fall-applied manure will underestimate the credit due to the manure. This is because all of the available manure N will not have converted to nitrate-N by this time.” (emphasis added)

The only time the spring pre-plant soil nitrate test would be valuable to determine manure application rates is when manure will be applied in the spring and manure was not fall-applied the previous year. This is neither the typical way manure is applied in Minnesota nor how manure will be applied for this particular Project. Therefore, the soil nitrate test is not a very useful tool for manure application rate decisions.
There is value in using the nitrate test in years when manure application is not providing nutrients for the crop, that is, when the nutrient needs are met by application of commercial fertilizers and manure had been applied two or more years ago. In these situations the application of nutrients would not be regulated by the feedlot permit since the nutrients applied for the planned crop are not from manure application.

**FINAL DETERMINATION ON ISSUANCE OF PERMIT COVERAGE OF PROJECT SITE 1 UNDER THE NPDES GENERAL FEEDLOT PERMIT**

52. The MPCA's decision to issue coverage under the Individual NPDES General Feedlot Permit for the Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7 feedlot sites are governed by its permit rule, Minn. R. 7001.0140, subp. 1., which states:
Except as provided in subpart 2, the agency shall issue, reissue, revoke and reissue, or modify a permit if the agency determines that the proposed permittee or permittees will, with respect to the facility or activity to be permitted, comply or will undertake a schedule of compliance to achieve compliance with all applicable state and federal pollution control statutes and rules administered by the agency, and conditions of the permit and that all applicable requirements of Minnesota Statutes, chapter 116D, and the rules adopted under Minnesota Statutes, chapter 116D, have been fulfilled.

53. Minn. R. 7001.0140, subp 2., states:
The following findings by the agency constitute justification for the agency to refuse to issue a new or modified permit, to refuse permit reissuance, or to revoke a permit without reissuance:
A. that with respect to the facility or activity to be permitted, the proposed permittee or permittees will not comply with all applicable state and federal pollution control statutes and rules administered by the agency, or conditions of the permit;
B. that there exists at the facility to be permitted unresolved noncompliance with applicable state and federal pollution control statutes and rules administered by the agency, or conditions of the permit and that the permittee will not undertake a schedule of compliance to resolve the noncompliance;
C. that the permittee has failed to disclose fully all facts relevant to the facility or activity to be permitted, or that the permittee has submitted false or misleading information to the agency or to the Commissioner;
D. that the permitted facility or activity endangers human health or the environment and that the danger cannot be removed by a modification of the conditions of the permit;
E. that all applicable requirements of Minn. Stat. ch. 116D and the rules adopted under Minn. Stat. ch. 116D has not been fulfilled;
F. that with respect to the facility or activity to be permitted, the proposed permittee has not complied with any requirement under parts 7002.0210 to 7002.0310 or chapter 7046 to pay fees; and
G. that with respect to the facility or activity to be permitted, the proposed permittee has failed to pay a penalty owed under Minn. Stat.§ 116.072
54. The Proposer has submitted complete applications. These applications have been reviewed and preliminarily approved by MPCA staff and demonstrate that all environmental protection standards will be satisfied.

55. The MPCA finds that the proposed issuance of permit coverage under the Feedlot Permit for the Daley Farms of Lewiston, LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7 feedlot sites, as public noticed on October 1, 2018, through November 15, 2018, and public noticed again from January 21, 2020, through March 6, 2020, meets the requirements of Minn. R. 7001.0140. The MPCA has reasonable assurance based on the information submitted that proper operation of the facilities in compliance with the requirements of the permit and completion of all required monitoring in accordance with the conditions of the permit issued by this order, will achieve compliance with all applicable state and federal pollution control statutes and rules and the conditions of the permit, and will not pose a danger to human health or the environment.

CONCLUSIONS OF LAW

1. The MPCA has jurisdiction over the decision whether to issue permit coverage under the Feedlot Permit for the Daley Farms of Lewiston, LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7 feedlot sites.

2. The MPCA has jurisdiction over the decision whether to grant or deny the request for a contested case hearing for the proposed modification of permit coverage under the Feedlot Permit for the Daley Farms of Lewiston, LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7 sites.

3. For the reasons set forth in this document, the requirements of Minn. R. 7000.1800, subp. 2(A) and Minn. R. 7001.1900, subp. 1 (A) have not been met with respect to the issues raised by the MCEA request for a contested case hearing on the permit coverage under the Feedlot Permit for the Daley Farms of Lewiston, LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7 feedlot sites. Therefore, the request for a contested case hearing is denied.

4. Due, adequate, and timely public notice of the proposed modification of permit coverage under the Feedlot Permit for the Daley Farms of Lewiston LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7 feedlot sites was given in accordance with Minn. R. 7001.0100.

5. The requirements set forth in Minn. R. 7001.0140 for modification of the notice of coverage under a Feedlot Permit and issuance of the notice of coverage under the Feedlot Permit are satisfied. Therefore, the modified permit coverage under the Feedlot Permit for the Proposer's Daley Farms of Lewiston, LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7 feedlot sites should be issued.

6. Any findings that might properly be termed conclusions and any conclusions that might properly be termed findings are hereby adopted as such.
ORDER

1. The Minnesota Pollution Control Agency determines that the issues raised by the CCHR do not meet the requirements of Minn. R. 7000.1800, subp. 2(A) and Minn. R. 7000.1900, subp. 1 (A) for granting a contested case hearing. The Minnesota Pollution Control Agency denies the requests for a contested case hearing.

2. The Minnesota Pollution Control Agency approves and authorizes modification of permit coverage under the Feedlot Permit for the Daley Farms of Lewiston, LLP, Daley Farms of Lewiston LLP1 and Daley Farms of Lewiston LLP7 feedlot sites.

IT IS SO ORDERED

____________________________________
Laura Bishop, Commissioner
Minnesota Pollution Control Agency

4/24/2020

____________________________________
Date
December 21, 2018

MPCA
18 Wood Lake Drive Southeast
Rochester, MN 55904

Re: Daley Farms of Lewiston, LLP – MMP Addendum

Dear MPCA,

Below please find an addendum to the Daley Farms of Lewiston, LLP MMP that was previously submitted. I also agree to the inclusion of these management practices in the Individual NPDES Permit for which I am requesting coverage under.

Addendum to Daley Farms of Lewiston, LLP MMP

Daley Farms of Lewiston, LLP will implement two or more of the following practices on field areas where liquid manure is applied.

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the MN Department for Agriculture soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by thermometer at a depth of 6 inches.

2. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.

3. Add a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MN Department for Agriculture soil temperature network website [https://app.gisdata.mn.gov/mda-soiltemp/](https://app.gisdata.mn.gov/mda-soiltemp/) or documented by soil temperature taken by thermometer at a depth of 6 inches.

4. Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Apply manure in the spring.

6. Split apply nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoid application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 and 6.

Daley Farms of Lewiston, LLP will submit a report to the MPCA if planned practices are unable to be implemented due to harvest delays and/or weather/field conditions are not conducive for implementation. The report will be submitted within 30 days of when the Daley Farms of Lewiston, LLP realizes the planned practice(s) will not be implemented and provide specific details as to the reasons why practice(s) implementation was not possible.

Daley Farms of Lewiston, LLP will also maintain the following records as applicable and relating to the items identified in part above. Records will be submitted to the MPCA as part of Annual Report information that is submitted.

1. The practices that were implemented for the crop year that is being reported.
2. The rate at which nitrogen stabilizing additives are added.
3. The soil temperature on the date of manure application and the method used to determine the soil temperature.
4. The type of cover crop seeded, the date when seeding occurred and the rate the cover crop was seeded at.
Daley Farms of Lewiston, LLP will also notify the MPCA so that on-site inspections may be performed at the discretion of the MPCA staff. These notifications will be done **one (1) to three (3) business days** prior to beginning each of the following construction activities:

1. The start of the excavation of the proposed liquid manure storage areas.
2. When the excavation process for the proposed LMSAs has reached the subgrade floor elevation.
3. Prior to any concrete pour associated with the liquid manure storage area.

Sincerely,

Ben Daley

[Signature]

Ben Daley
Minnesota Pollution Control Agency
Daley Farms of Lewiston, LLP – 2018 Dairy Expansion

LIST OF COMMENT LETTERS RECEIVED ON THE FEEDLOT PERMIT DURING THE ADDITIONAL COMMENT PERIOD (January 21, 2020 through March 6, 2020)

1. kll3030@hotmail.com. Email received January 21, 2020.
10. James Pelowski. Email received February 27, 2020.
12. Minnesota Center for Environmental Advocacy. Email received March 6, 2020.
13. Beth Slocum. Email received March 6, 2020
I drink milk and breathe air and drink water. The problem with the mega farm is the manure. A small farm can use manure as a fertilizer. How many mortalities are on mega farms.

Will Daily Farms be asked to use solar power and wind turbines?

If the farms fail who does the clean up.
Mark
I lived on a dairy farm, run-off and leaching of nitrate into the soil happens no matter how plans are made to avoid it. That will be someone's drinking water!!!!!!!
I oppose the granting of any permits to expand numbers of cattle.
Winona, Mn.
Jan. 23 - 2020

Mark Arens
MPCA 1 8 Civic Center Plaza
Suite 8165
Mankato, Mn. 56001

Dear Mark:

In regard to the article in the post about the Dakey Farm,

I am concerned about the safety of our drinking water.

Some years ago by the John Schloegel farm the soil hole. With the fence posts—-dangling in the air—-How many more are there ? and new ones.

In the event of a large rain fall-5-6” or more. What kind of control do we have in a field? They think they have it solved!!!

What happened to the Trout fish? What? There is no mention of that. In Janes Day he did enjoy going Trout fishing. (a sport)

Were they ever safe to eat now. (closed)

I like to see smaller dairy farms, have some farms without a factory farm is the area.

There farm is large now!!!

Sincerely, Mildred Marg
Dear Mr. Dance,

My husband and I live one
mile east of Delia Farms of
Lindstrom LLP.

The enclosed is the result of
our well test of 7/31/19. Nitrates
level measures 13.33 ppm.
This is reason for grave concern.

Karen M. Ahrens

FECTIVED

Jan 28, 2020

Private Office
MICOA

Richard and Karen Ahrens
200 West Main St
Lindstrom, MN 55043
Nitrate Results Explanation Handout

The Minnesota Department of Agriculture and Winona County SWCD would like to thank you for participating in this Nitrate Clinic. Below is general information regarding nitrate result ranges.

<table>
<thead>
<tr>
<th>7-31-2019 Nitrate Clinic Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample ID</td>
</tr>
<tr>
<td>Ahrens Farm Well</td>
</tr>
</tbody>
</table>

THE METHOD USED AT TODAY'S TESTING CLINIC IS CONSIDERED A SCREENING TOOL. Ten parts per million (ppm) NO3-N (nitrate-nitrogen) is the US Drinking Water Standard. The 10 ppm standard for nitrate is equivalent to 10 parts of nitrate-nitrogen in 1 million parts of water.

**If the Nitrate result is between 0 to 4.9 mg/L:**
- Continue to test your water for nitrate every year or every other year.
- Properly manage nitrogen sources when used near your well. Continue to monitor your septic tank. Sewage from improperly maintained septic tanks may contaminate your water.
- Private wells should be tested for bacteria at least once a year. A Minnesota Department of Health (MDH) certified water testing lab can provide nitrate and bacteria testing services. Search for the lab nearest you at www.health.state.mn.us/labsearch

**If the Nitrate result is between 5 to 9.9 mg/L:**
- Presently the nitrate nitrogen level in your water is below the nitrate health standard for drinking water. However, you have a source of contamination which may include: contributions from fertilized lawns or fields, septic tanks, animal wastes, and decaying plants.
- Test annually for both nitrate and bacteria. As nitrate levels increase, especially in wells near cropped fields, the probability of detecting pesticides also increases. MDA monitoring data indicates that pesticide levels are usually below state and federal drinking water guidelines. For more information on testing and health risks from pesticides and other contaminants in groundwater go to: https://www.mda.state.mn.us/private-well-testing-testing-laboratories-home-water-treatment
- In addition to pesticides, high nitrate levels may suggest an increased risk for other contaminants. For more information go to: https://www.health.state.mn.us/communities/environment/water/contaminants.html

**If the Nitrate result is above 10 mg/L:**
- Do not allow this water to be consumed by infants. Over 10 mg/L is not safe for infants younger than 6 months of age. Do not boil the water, this increases the nitrate concentrations in the remaining water.
- Pregnant women and people with reduced stomach acidity also may be at risk along with other people with specific metabolic conditions. Find a safe alternative water supply.
- Be sure to retest your water and have a licensed well contractor inspect your well prior to making any significant financial investment in your existing well system. See link to MDH certified labs listed above.

Over 10 ppm is not safe for infants younger than 6 months of age. Infants consuming high amounts of nitrates may develop Blue Baby Syndrome (Methemoglobinemia). This disease is potentially fatal and first appears as blue coloration of the fingers, lips, ears, etc. Seek medical assistance immediately if detected.

If you have questions about the Nitrate Testing Clinic, visit the MDA website at www.mda.state.mn.us/water-testing-nitrate or contact Eric Noeker at eric.nooker@state.mn.us or 651-318-6002. If you have additional questions about wells or well water quality in Minnesota, contact your local Minnesota Department of Health office and ask to talk with a well specialist or contact the Well Management Section Central Office at health.wells@state.mn.us or at 651-201-4600 or 800-383-9808.
Dear Mark P. Gernes, Mn Pollution Control Agency:

This letter is to express my unequivocal opposition to the utterly preposterous expansion proposal by the Daley Farms of Lewiston MN, and the efforts of Ben Daley (and his cohorts) to avoid, or simply ignore, the anti-pollution requirements of the equivocating MPCA.

Greenhouse gases, Manure leakages - water (e.g. ground water), ground dispersion and pollution of farm land and ground water. Of course there will be pollution of ground water in spite of whatever rediculous promises (e.g. pseudo-science, prayers, and astonishingly absurd "best environmental practices") Ben Daley and family/owners and their attorneys will devise. Can nitrate pollution of the water wells in Winona County be good for those of us who drink water? NO. Past runoff violations by the Daley farm has been a health mess in Winona County, and these runoff contamination of wells will be compounded and continued with the dairy cow expansion.

I want the MPCA to require a full and complete Environmental Impact Statement by the Daley Farms of Lewiston, LLP.

I do not know Ben Daley or anyone in the Daley family.

Cordially,

Richard Stephen Schwartz

Richard Stephen Schwartz
1463 Park Lane
Winona, MN 55987
This message may be from an external email source.
Do not select links or open attachments unless verified. Report all suspicious emails to Minnesota IT Services Security Operations Center.

Please see attached.
Feb 10, 2020

Kim Grosenheider  
Resource Management and Assistance Division  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, MN 55155  
Email: kim.grosenheider@state.mn.us

Dear Ms. Grosenheider,

I write to you today regarding the Supplemental Environmental Assessment Worksheet (EAW) related to potential greenhouse gas emissions related Daley Farms of Lewiston dairy expansion and modernization project.

The Minnesota Pollution Control Agency (MPCA), following a detailed analysis—based on the facts and science- state that the Daley Family's project will not have any negative environmental impacts.

Not only do the manure basins not only meet, but far exceed, required engineering standards. Additionally, according to a study of air emissions from the Daley Farm expanded facility, it would meet air quality standards and odor guidelines.

During the hearing on February 4th there where references to high levels of GHG coming from modern dairy facilities. Studies indicate that resources used to produce the same amount of milk in 2012 vs 1944 use 21% of the cows, 35% of the water, 10% of the land and produce 37% of the carbon footprint. The average US dairy cow produces 4X the world average. The EPA released a study from 2016 that shows GHG emissions from animal agriculture represent less than 4% and crops 5%. Significantly lower than the 18%+ reported by others. Since consumers are concerned about GHG they may wish to consider their own food waste which was recently reported to be 12% loss at the retail level and 20% at the consumption level. It would appear that we have a great opportunity to reduce GHG by reducing our waste of food.

The consumer demand for cheese continues to grow, the cows will be milked, and the cheese produced somewhere in the US. How does changing the zip code of where the cow lives change its green house gas emissions? Modern facilities and excellent management have a role in environmental impact. Daley farms are looking to upgrade the facility and have a long history of excellent management practices. Any additional delays and cost will continue to send signals to the dairy industry that the State of MN doesn’t support modern agriculture and you would be wise to take your business and tax base to another state.

I strongly support the efforts of the Daley Family to pass their dairy farm to the next generation and believe their project have been held up for far too long.

Sincerely;

Darwin Droogsma  
Milaca, MN
Gernes, Mark P (MPCA)

<table>
<thead>
<tr>
<th>From:</th>
<th>John Campe <a href="mailto:jcalpine@acegroup.cc">jcalpine@acegroup.cc</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sent:</td>
<td>Friday, February 14, 2020 10:40 AM</td>
</tr>
<tr>
<td>To:</td>
<td>Gernes, Mark P (MPCA)</td>
</tr>
<tr>
<td>Subject:</td>
<td>Daley Farms</td>
</tr>
<tr>
<td>Attachments:</td>
<td>Letter 02 14  2020 (mg).docx</td>
</tr>
</tbody>
</table>

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Mark, Comment letter attached. Sending original by first class mail today.
John
John F. Campe  
39342 County Road 8  
Dakota, Minnesota 55925  

February 14, 2020  

Mark P. Gernes  
Watershed Division  
Minnesota Pollution Control Agency  
12 Civic Center Plaza, Suite 2165  
Rochester, MN 56001  

RE: Daley Farms of Lewiston, LLP  
18714 Highway 14  
Lewiston, MN 55952  

Dear Mr. Gernes:  

Based on my physical observation over the past several years:  

1. The dairy facility have been well maintained.  
2. The applicant has managed the animal waste in prudent manner.  
3. The livestock have been treated in a humane and responsible manner.  

Livestock is important to Southeast Minnesota in maintaining soil fertility naturally thereby reducing the need for chemically based fertilizer.  

For the 3 reasons based on my physical observation and the need to maintain and build soil fertility I would respectfully request that your agency waive an EIS and approve the application.  

Very Respectfully,  

John F. Campe
Daley Farms draft permit 2020

Your comments matter

The draft feedlot permit for the proposed Daley Farms’ expansion is open for public comment. Please use this sheet to submit your comment. The more specific, the better. The Minnesota Pollution Control Agency (MPCA) will respond to all comments received by the deadline. To receive a response, please include your name and contact information.

Deadline for comments: 4:30 p.m. Feb 28, 2020 – Mar 6, 2020

<table>
<thead>
<tr>
<th>Name:</th>
<th>Dean Flugstad</th>
</tr>
</thead>
</table>
| Address:      | 72243 30th Ave  
Lake City, MN 55041 |
| Email:        | djflug@gmail.com |

Section of draft permit document:

Page number(s):

My recommendation for additions and/or changes:

After much study and talking to others and frustration with permits always being approved, I feel the only way to help decrease pollution from Ag related operations is to incentivize no till and cover crops practices. Apparently this reduces chemical inputs, builds up soil health and reduces runoff. So that is my recommendation.

Cover Crops + No Till

This of course will reduce air pollution too by sequestering carbon.

Use back of sheet if needed.

Mail or email this comment sheet to:

Mark Gernes
MPCA
12 Civic Center Plaza, Suite 2165
Mankato, MN 56001
mark.p.gernes@state.mn.us

More information: 507-344-5260

Note: The draft permit is available online:

RECEIVED
FEB 20 2020
Mankato Office
MPCA
Mr. Gernes

We attended the meeting in Lewiston, MN on February 4th. Although the meeting was supposed to be about green house gas emissions, most of the time was spent on water quality. Many people had concerns about the ground water being contaminated with nitrates. It seems to us that they are overlooking the fact that injecting the proper amount of manure into the ground would be far less harmful than applying any other form of nitrogen, if applied proportionately. If the Daley Farm has access to enough farm land they will be able to disperse the manure in a safe and effective manner.

Winona County has seen a large reduction in the number of head of cattle in the past several years. There are less head of cattle per acre now than in the past decades. Farmers are being told by the Department of Agriculture that by the year 2050 9 billion people will be living on the planet and farmers worldwide need to increase their production by 65%. How is this going to happen if every attempt by someone in the agriculture community is met with resistance. The world has to be fed and it will be led by the American Farmer.

The Daley Farm is being managed by very responsible people, we feel they will have no problem abiding by the rules set by the MPCA. We must give the next generation of farmers a reason to want to farm. We are asking our children to stay in a profession that comes with long hours, little pay, and for the most part no appreciation. If our children see that they will be met with resistance at every turn, we fear there will be no one left to carry on the tradition of farming in America.

Sincerely,

Willard and Nora Drysdale
Wabasha, MN
10

Dairy Expansion 2020
As a neighbor to the Daley's I will only supply all issues. I am 82 years old and been in the dairy business for 24 years. Working at IBM for over 30 years, ordering parts for 24 years and retired from purchasing February 1987. We still farm full time. During the 80's dairy began to weaken. A reduced production plan was enacted which we were part of it. We produced less milk during the year and were rewarded for that year. We talked about this at IBM and one employee said that producing less milk is not the answer. Now the issue is to produce more milk in a declining market. The industry needs further sales not more milk. When IBM sales dropped we produced less and created products for future sales to keep going. The dairy industry failed in this respect. There were so many opportunities for dairy to explore and so other business took hold instead. Make dairy more efficient is all they understood and caused dairy to sour right from the beginning. Milk consumption is still dropping today because of previous errors. While I was in dairy our farm was poisoned by drift of glyphosate (roundup) we lost a quarter of our milking cows and total cattle death was 23 head. The day of the drift I became very sick later ending up in the hospital. I purchased a large life insurance after I lost a lot of weight so the wife could continue on living and maybe move to town and every medical center I went for help, they only said they would check me over but no guarantee of recovery. What the wife and I did next is to long to talk about. If you want to know about it, just let me know. It is all on record. The weed killed roundup. First it kills all weeds. Seeds treated to grow when used will grow. However glyphosate inhibits something called the P450 enzyme system. This a master system our body uses to detox chemicals that we’re exposed to. Animal studies done over their life time caused kidney and liver problems, greatly increased cancer risk and led to a shorter life span. Second—glyphosate actually alters DNA basically an amino acid called glycine. Than when your cells are forming proteins they can mistakenly bind to glyphosate instead of glycine, that changes the structure and function of the brain proteins causes damage to them and memory loss. I don't know about you but none sounds to good for me. When following glyphosate use from the beginning the following are increases of chronic diseases since. A Hugh increase of—Acute and subacute, Al amyloidosis, Autism—Alzheimer's—bronchus, —B-cell Leukemia, diabetes type II—Chronic Lymphocytic—depression—heart disease—Hodgkin’s disease—Ischemic heart disease—Leukemia, —obesity—Porphyria Cutanea Tarda, —Prostate cancer, —Respiratory cancer,—Soft-tissue sarcoma—Lung, bronchus, larynx, —infertility—cancer—gastrointestinal diseases. All you have to do is connect the dots. I don't know about you, but I went thru the torture, and came close to dying, but I went to China after my poisoning and found part of my answer. Now it is time for decision making to more flood a declining market. Pres. Trump is cleaning up the waste in his swamp and it could include farm subsidies. He knows that it a total waste of money to increase product in a declining market and he is right. Most feed back you will receive about ground water, etc and I question who pays to clean up our water (the expansion could use up to 92 million gallons a year) when that happens. God gave us humans a clean earth and to do other is against promise. At this point a decision has to be made against or for God’s clean earth. You be the judge. He remembers every thing and you will meet him some day. Personally I am bannned from consuming factory farm milk for this reason. Thank you James Pelowski. 31071 County Road 113. Utica, Minnesota. 55579. Ph 1-507-932-4665. ie. any questions, write me.

ie--- check the p450 gene suppression on the internet. I am a very informative person.
To: Commissioner Laura Bishop

CO/ MPCA EAW contact person: Kim Grosenheider Resource Management and Assistance Division Minnesota Pollution Control Agency 520 Lafayette Road North St. Paul, MN 55155 Phone: 651-757-2170 Email: kim.grosenheider@state.mn.us

Mark P. Gernes Watershed Division Minnesota Pollution Control Agency 12 Civic Center Plaza, Suite 2165 Mankato, MN 56001 Phone: 507-344-5260 Email: mark.p.gernes@state.mn.us

RE: Daley Farms of Lewiston, LLP 18774 Highway 14 Lewiston, MN 55952 Utica Township Winona County, supplement to the 2018 EAW.

Dear Commissioner Bishop:

We can no longer ignore the crisis we are in regarding our natural systems break down and the erratic climate. The 2018 IPCC report clearly states that the greatest risk to humanity is two-fold, the loss of biodiversity and the catastrophic climate crisis. This project significantly impacts both.

I am extremely concerned about the urgent need to reduce GHGs in all areas and economic sectors of our state. The Daley Farm is already one of the largest dairy farms in the state. Winona County has a cap of 1,500 animal units – this project cannot be permitted without further breaking this regulation. This project should not be permitted due to increasing the climate crisis at a time when we urgently need to do all we can to reduce emissions and reduce pollutants in our air and water.

An EIS (Environmental Impact Statement) should have been required for the increased impact to water, air, and wildlife an increase in animal units of this magnitude creates. I, and many other citizens of this state, are losing any confidence in our public agencies for the rubber stamping and complete mockery of your mission to “protect and improve the environment and human health”. This is one more instance of this complete break down in responsibility. Stine’s refusal to acknowledge that an increase of this size in Minnesota’s sensitive karst region fails the public’s interest. This project puts communities already dealing with contaminated water and poor air quality in further health risk.

An increase of 20,300 tons of potent GHGs – N2O, and CH4 – is extremely significant in this time of climate crisis. This increase calls for an EIS.

Estimating offsets without the full analysis this substantial increase requires is unacceptable. The citizens of this state must take the brunt of water quality loss, air quality impacts, and especially the impacts of climate change. Increased economic loss from catastrophic weather events and changing
weather patterns affects the whole state. Because Environmental Quality Board guidance is not currently available, and the information MPCA would need to conduct a full GHG life-cycle analysis is not readily available, a trigger for a full and comprehensive EIS or a permit denial has been met. (Minn. Statute 4410.1700, Subp.2a. Insufficient Information)

An industrial-scale animal factory is not exempt. I urge you to do the right thing for our future and deny this permit. Courage means following Minnesota law to protect all of Minnesota's citizens, not just those seeking to create profit.

Thank you for the attention to my comments,

Lois Norrgard
10368 Columbus Circle
Bloomington MN 55420
Hello Mark,

Please find the above referenced comments and contested case hearing request, submitted on behalf of Minnesota Center for Environmental Advocacy, attached at the request of Amelia Vohs.

Regards,
Eric

Eric Lindberg
Legal Assistant
Minnesota Center for Environmental Advocacy
Direct: (651) 287-4808

Website: www.mncenter.org
Facebook: www.facebook.com/MCEA1974
Twitter: @MCEA1974

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Minnesota Center For Environmental Advocacy’s

Comments and Petition for a Contested Case Hearing on The Draft National Pollutant Discharge Elimination System Permit for the expansion proposed at the Daley Farms of Lewiston, LLP operation in Winona County

March 6, 2020

SUMMARY

The Minnesota Pollution Control Agency (“MPCA”) again proposes to issue a National Pollutant Discharge Elimination System (“NPDES”) permit authorizing Daley Farms of Lewiston LLP (“Daley Farms”) to expand its dairy operation. The Minnesota Center for Environmental Advocacy (“MCEA”) continues to oppose issuance of this permit as drafted and again requests that the MPCA modify the permit to make it adequately protective of water quality standards. In the alternative, MCEA requests that MPCA grant a contested case hearing so that material issues of fact can be heard by a neutral administrative law judge who can develop the record and present a recommendation to the MPCA.

I. HISTORY AND STATUS

MPCA proposed to terminate environmental review (issue a negative declaration on the need for an Environmental Impact Statement (“EIS”)) and to issue this permit in October, 2018. In response, MCEA and others commented that (1) MPCA’s environmental review was deficient because it did not address the project’s greenhouse gas emissions; (2) an EIS was mandated as the result of the potential for significant impacts from nitrate discharges to ground and surface water; and (2) the permit should not be issued as proposed because the Daley Farms manure management plan (“MMP”) failed to comply with applicable laws and would aggravate existing excessive
nitrate levels in ground and surface water. MCEA supported its comment with a report from a
noted expert in soil science and agronomy. On the nitrate-related issues, MCEA requested that
MPCA grant a contested case hearing.

MPCA did nothing in response to MCEA’s comment that the EAW failed to assess
greenhouse gas emissions, asserting only—in its responses to comments—that MPCA was not
required to consider greenhouse gas emissions because the feedlot EAW form did not include a
section for collection of that information. Administrative Record (“R”) 3008. To respond to public
comments regarding the project’s impact on existing unacceptable nitrate levels in ground and
surface water, MPCA modified the permit to include a “menu” of 7 “options,” from which Daley
could “choose two or more,” to mitigate nitrate pollution resulting from its manure application
(“pick two menu”). R1822-3. Despite the significance of this change to the permit, MPCA did not
seek further comment from the public or MCEA, but simply proceeded to issue a negative
declaration on the need for environmental review, and to issue the permit. MCEA appealed both
decisions.

On October 14, 2019, in an unpublished opinion, the Court of Appeals reversed MPCA’s
negative declaration on the need for further environmental review on the ground that MPCA had
erred in not considering the environmental impacts arising from the increase in greenhouse gases
from the project. The Court also reversed MPCA’s decision to issue the permit. Matter of Denial
of a Contested Case Hearing Request & Modification of a Notice of Coverage Under Individual
Nat'l Pollution Discharge Elimination Sys. Feedlot Permit No. MN0067652, No. A19-0207, 2019

When environmental review is deficient, permits issued on the basis of that environmental
review are voided and appeals regarding the conditions of such permits and contested case requests
are moot. *City of Winona v. Minnesota Pollution Control Agency*, 449 N.W.2d 441, 442 (Minn. 1990). As a result, the Court of Appeals had no need to opine on the adequacy of the NPDES permit or whether MPCA should have granted a contested case hearing. *Id.* Nevertheless, the Court of Appeals issued an opinion that purported to affirm MPCA’s reliance on the mitigation provided by its feedlot rules, stating “[t]he MPCA’s reliance on the existing regulations was proper because the regulations provide specific measures that Daley Farms must take to mitigate the potential for significant environmental effects.” Opinion at *10.

The Court of Appeals also relied on Daley Farms’ commitment to comply with the “pick two menu” as supporting the necessary specificity of the mitigations and the appropriateness of MPCA’s denial of MCEA’s contested case hearing request. *Id.* at *11-12.

The Court of Appeals’ opinion on the adequacy of the moot permit and the MPCA’s decision not to grant a contested case hearing is an “advisory opinion” because the Court’s environmental review decision rendered the permit questions moot.1 Advisory opinions on moot issues are disfavored by the courts. “The doctrine of mootness requires that we decide only actual controversies and avoid advisory opinions.” *In re McCaskill*, 603 N.W.2d 326, 327 (Minn. 1999). This permit is not an “issue” that is “capable of repetition yet evades review” such that it warrants an advisory opinion. *Cf. State v. Brooks*, 604 N.W.2d 345, 347 (Minn. 2000) (inmates released from custody before bond issue resolved). Nor is it “functionally judiciable” or an important question of statewide significance that should be decided immediately. *See Dean v. City of Winona*, 868 N.W.2d 1, 6 (Minn. 2015) (challenge to city’s rental ordinance not of statewide significance).

As a result of the Court’s opinion on environmental review, a new record will be compiled. MPCA

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1 MPCA appears to understand this because it published the 2020 NPDES permit again along with its minimally revised EAW for new public comments. The fact that MPCA chose not to include any new conditions in the permit whatsoever does not change this analysis.
must use this \textit{new record} to decide whether MPCA should issue the permit. See \textit{City of Winona v. MPCA} at 442. In particular, the new record will now include public comments and a new expert analysis of the “special conditions menu” that MPCA created \textit{after the comment period was complete}. As a result, MPCA is not free to ignore the comments and contested case hearing request in this comment on the basis that the Court of Appeals has already decided the issues.

II. \textbf{THE NPDES PERMIT IS INADEQUATE AND MUST BE DENIED OR SUBSTANTIALLY REVISED}\textsuperscript{2}

Despite having a chance to do so, MPCA has made \textit{no changes whatsoever} to the 2018 proposed NPDES permit in light of its new greenhouse gas analysis, new climate change data that could affect permit calculations (particularly storm events), or as the result of further consideration of the issues raised by MCEA and its expert with the project’s MMP.

MCEA reaffirms and incorporates by reference its prior comment on the Daley Farms NPDES permit, and, in particular, incorporates by reference the attachments to that comment. However, because MCEA did not have an opportunity to comment on the “pick two menu” nor MPCA’s responses to comments during the prior public comment period, MCEA’s current comment focuses on the adequacy of the “pick two menu” to prevent nitrate pollution, the accuracy of MPCA’s responses to MCEA’s comments on the MMP, and unresolved comments.\textsuperscript{3}

\textsuperscript{2} A substantially-revised permit must be reissued for comment. \textit{Reserve Min. Co. v. Minnesota Pollution Control Agency}, 364 N.W.2d 411, 414 (Minn. App. 1985).

\textsuperscript{3} MCEA has confirmed that, despite the passage of more than a year, MPCA is relying on exactly the same MMP as originally submitted with the application.
A. The Proposed Application Rate Exceeds The Agronomic Rate, And The MMP Fails To Apply Proper Manure Crediting.

The MPCA’s manure application rule limits “application rates” to “expected crop nitrogen needs.” Minn. R. 7020.2225, subp. 3(A). The rule further states that “[e]xpected crop nitrogen needs, crop nitrogen removal rates, and estimated plant available nitrogen from manure and legumes must be based on the most recent published recommendations of the University of Minnesota Extension Service or of another land grant college in a contiguous state.” Minn. R. 7020.2225, subp. 3(A)1. The Daley Farms MMP fails to conform to this rule because proposed rate of application exceeds recommended rates based on the “Maximum Return to Nitrogen” system (“MRTN”) which Midwest universities employ, especially where the limitation is being employed to protect water quality. This is not a “legal issue,” but instead a factual dispute about whether the Daley MMP is based on the recommended rates.4

The Daley MMP specifies that Daley will apply 180 lb N/acre on the manure application fields in a corn following corn rotation. R5832. According to the MMP document, this rate is based on the University of Minnesota’s 2001 recommendations, which are based on “expected yield.” Id. However, since 2001, the University of Minnesota and other Midwest universities have shifted to the use of the “MRTN” or “Maximum Return to Nitrogen” method. This method is intended to help producers determine the rate of applied nitrogen (“N”) that produces the maximum economic

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4 In its prior findings, MPCA attempts to characterize this issue as “legal.” But there is no dispute that the rules limit application to a rate supported by the “most recent published recommendations” of the University of Minnesota or similar university. MCEA simply asserts that MPCA has failed to require Daley’s to apply a value consistent with what is recommended. This is a disputed factual issue because it can be resolved with expert testimony and reference to existing records. It is not an attack on the rule itself.
return for selected prices of fertilizer N and corn, and was based on 70 field research trials. See Exhibit 1, Report of Gyles Randall, at 2. As announced by the University of Minnesota soil science department:

There’s been a major change in nitrogen guidelines for corn production in Minnesota. *Nitrogen guidelines are no longer linked to yield goal.* Instead, soil productivity, economics, and the grower’s attitude toward risk are major considerations.

The new nitrogen guidelines for corn/corn and corn/soybean rotations are listed in Table 1. These guidelines are appropriate for highly productive soils. The N Price/Crop Value column requires that the corn producer divide the cost of a pound of nitrogen by the dollar value of a bushel of corn. This ratio will vary for individual corn producers.

The “MRTN” column lists the rate of nitrogen to apply for various “Price/Crop Value” ratios. Choose the recommendations that correspond to the calculated ratio.

The “acceptable range” column lists a range of nitrogen rates that might be used for the various “Price/Crop Value” ratios. The lower rates are for producers who are conservative. The higher rates are for those who are aggressive.

Exhibit 2 (emphasis supplied). This change means that manure management plans based on the expected yield goal—as is the Daley Farms plan—are no longer valid. The recommendations document provides the following table:

**Table 1:** Guidelines for use of nitrogen fertilizer for corn grown on soils considered to be highly productive

<table>
<thead>
<tr>
<th>N Price/Crop Value Ratio</th>
<th>*MRTN</th>
<th>acceptable range</th>
<th>MRTN</th>
<th>acceptable range</th>
</tr>
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<tbody>
<tr>
<td>0.05</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>0.10</td>
<td>155</td>
<td>130 to 180</td>
<td>120</td>
<td>100 to 140</td>
</tr>
<tr>
<td>0.15</td>
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<td>120 to 165</td>
<td>110</td>
<td>90 to 125</td>
</tr>
<tr>
<td>0.20</td>
<td>130</td>
<td>110 to 150</td>
<td>100</td>
<td>80 to 115</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>100 to 140</td>
<td>85</td>
<td>70 to 100</td>
</tr>
</tbody>
</table>

*MRTN – Maximum Return To Nitrogen*
Id. Thus, where Daley Farms plans to plant “corn following corn,” it must limit its rate to the most recent recommendation of the University of Minnesota, which is 155 lbs. N/acre.\textsuperscript{5}

MPCA has acknowledged that the MRTN value should be used when calculating the rate of nitrogen fertilizer. Exhibit 3 (“N application rates that exceed the MRTN, increase the likelihood of N leaching/loss. Therefore, the MPCA expects N application rates to be consistent with the appropriate MRTN values.”). But instead of acknowledging the actual recommended MRTN, MPCA directs producers to the “maximum” MRTN value in what MPCA identifies as the “acceptable range.” According to the MPCA, this value is (for corn following corn) of 195 lbs. N/acre, although MPCA acknowledges that “farms in southeast Minnesota with loess soils may be able to maximize yield with lower rates of N.” Id.

The argument that a value that is more than the actual identified MRTN rate is acceptable must be rejected where, as here, the MRTN recommendation is being used as a surrogate for an environmental control, and not as a price/value recommendation. Thus, especially for the southeast Minnesota area, MPCA should not approve MMPs on the basis that 195 or 180 lbs. N/acre is consistent with the recommended rate. The fact that some “aggressive” producers would be willing to spend more to ensure the same result as the scientifically-supported lower rate of application should not be confused with the actual recommended MRTN value as supported by scientific studies. As Dr. Gyles Randall notes in his attached report, the MRTN system was not developed to protect the environment, but instead to ensure that agricultural producers do not overspend on nitrogen fertilizers. Dr. Randall notes that the MRTN method contains “no environmental

\textsuperscript{5} Dr. Randall states that the University of Minnesota MRTN figure is 165 lb. N/acre. See Exhibit 1 at 3. Although this is a minor difference, it highlights the fact that the University of Minnesota does not appear to “speak with one voice” with regard to its recommendations, which undermines the effectiveness of MPCA’s land application rule’s incorporation by reference.
interpretation other than supporting documentation stating from time to time “the MRTN value minimizes leaching losses of N.” Exhibit 1 at 2-3 (emphasis in original).  

The University of Minnesota has addressed appropriate use of the MRTN value where the application involves environmental issues, which no party disputes is the case here. University of Minnesota fertilizer guidelines identify that “if water quality concerns are an issue and/or a localized N response data support lower N rates, producers may choose N rates near the low end of the acceptable range…” Exhibit 4 at 15 (emphasis added). Although Dr. Randall notes that various University of Minnesota documents include ranges up to 210 lb N/acre where manure is the vehicle for nitrogen delivery, these ranges “will likely lead to severe leaching losses of nitrate-N to groundwater.” Exhibit 1 at 3. Given that the MPCA’s land application rule is intended to

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6 Dr. Randall notes: “Nitrogen application rate studies conducted on Port Byron and Mt. Carroll soils in southeastern Minnesota often include determining the amount of nitrate-N that remains in the 0-5’ soil profile in the fall from the spring-applied N after corn has been harvested. Residual nitrate-N from the spring-applied N increased slowly in the soil profile as application rates increased toward the economic optimum N rate. As the application rates reached the optimum N rate and beyond, residual nitrate-N amounts were increased exponentially. Therefore, even at the MRTN rate some excess nitrate occurs, but with application rates above the MRTN excess levels of nitrate occurs exponentially.” Exhibit 1 at 3. For another explanation of how MRTN recommended values correspond to nitrate leaching including graphs charting MRTN values against leaching nitrate, see Exhibit 5.

7 During the 2018 comment period and subsequent appeal, MCEA also raised an issue with regard to the proper “price factor” to be used for manure, i.e., whether “0.05” or “0.10” is appropriate. The “0.10” factor is appropriate for the following reasons. First, where environmental concerns are present, the most recent manure application guidelines from the University of Minnesota (2019) note that lower application rates, based on the 0.10 price ratio maximum return to nitrogen value or “MRTN,” or higher, may be considered for environmental concerns. Exhibit 6. Second, MPCA’s own technical staff questioned the use of the 0.05 value. The staff team noted that the increase of yield produced per pound of N applied is very small, noting that there is “only a 1% difference in yield between the rates for the 0.05 and 0.10 price ratios for the corn following corn rates.” R9455. The same staff member noted that the excess 15 pounds of nitrogen allowed using the 0.05 MRTN Rate (183 pounds of N per acre) would add up to 10,980 pounds of N lost to the surface or ground water and that this excess 15 pounds of nitrogen per acres could amount to an annual excess loading of between 0.7% and 1.3% of the total N load in this subwatershed, assuming all ended up in the surface water. R9456 (emphasis added).
protect water quality, the true recommended value is the “standard” MRTN value of 155/165 lbs. N/acre, not an aggressive application rate. As Dr. Randall notes, given the soils and the existing groundwater threats in the area of the project, the MRTN agronomic rate of 165 lb N/acre obtained with a 0.10 ratio is strongly recommended. Exhibit 1 at 3.

The second issue with the Daley Farms MMP is that it fails to credit manure applications in subsequent years, as required by MPCA’s land application rule. Minn. R. 7020.2225, subp. 3.(3); Minn. R. 7020.2225, subp. 4.D.(7). As noted by the University of Minnesota extension service:

[Typically, plants can only use the inorganic form of nutrients, but manure supplies both organic and inorganic forms. Microbes can break down organic forms of nutrients and mineralize them into inorganic forms. However, this can take several years and depends on soil moisture and temperature conditions.]

Exhibit 7 at 6. Because manure produces nitrate slowly—over more than one growing season—it cannot be managed in the same manner as commercial fertilizer. In fact, MPCA notes the failure to credit nitrogen from previous manure applications as one of the most common problems affecting manure management plans. Exhibit 8. Thus, where manure is being applied as fertilizer, an MMP must “credit” the manure in subsequent years, and not simply apply the same amount of manure in years 2 and 3 as applied in year 1. Yet, that is exactly what the Daley Farms MMP does. 8

As Dr. Randall notes:

In the 6-Yr Soil P Management Plan shown on pages 13 and 169 of the MMP, calculations show identical rates of 14,000 gal/acre of manure applied in Years 1, 2, and 3 of Scenario 1; 15,000 gal/acre of manure applied in Years 1, 2, and 3 in Scenario 2; and 15,000 gal/acre of manure applied in Years 5 and 6 in Scenario 3. Yet the table showing manure-N availability on pages 19 and 144 and on Table B states that 25% of the dairy manure-N applied carries over to the following year. Two questions: Why was the 25% carryover not considered in calculations shown on pages 13 and 139? (2) Why was the manure application rate for corn silage 1000 gal/acre greater than for corn? I’ve never seen that distinction in N or manure

8 In addition, the manure application rate is higher for corn utilized as silage for no reason. Dr. Randall made this observation in his 2018 comment as well, but MPCA did not respond. R.2912.
management publications? It is issues like this that cause me to wonder if the permit really is being applied for protecting water quality or is it simply to apply more manure on fewer acres, regardless of water quality impacts.

Exhibit 1 at 4. Dr. Randall made a similar comment in his 2018 report (R2912) but MPCA has taken no heed. The MPCA must review and correct the MMP to reflect the correct “crediting” for the prior year’s manure application, with appropriate adjustments to the acres required for manure application, before it may issue this permit.

Whether an MMP will result in the application of manure consistent with agronomic rate limits in Minn. R. 7020.2225 is a material issue of fact. If MPCA does not require Daley Farms to revise and resubmit its MMP with correct rate calculations, MPCA should grant a contested case hearing on the issue of the appropriate rate and manure crediting. MCEA has met established criteria for obtaining a contested case hearing by submitted expert testimony and scientific evidence demonstrating that MPCA’s proposed permitting action will not comply with applicable rules material to this permit, including the agronomic rate limit. Minn. R. 7001.0130 (references standard in Minn. R. 7000.1900).

B. The Adequacy Of The Menu Of Special Conditions Is Material And Disputed.

As noted in its prior comment at p. 3, MPCA must ensure that an NPDES permit contains “conditions necessary for the permittee to achieve compliance with all Minnesota or federal statutes or rules.” Minn. R. 7001.1080, subp. 1. If MPCA’s rules are not adequate to ensure that water quality standards are being met, MPCA has an obligation to include special conditions in permits necessary to protect those standards. Minn. R. 7001.0150, subp. 2.

1. Special manure management conditions are required by law.

MCEA’s prior comment established—and MPCA does not dispute—that the proposed project and most of its identified manure management fields are located in an area of where soils
are prone to leach nitrate to groundwater and where existing groundwater conditions already exceed applicable nitrate limits and private and public water supplies are under threat. R2902-6. High nitrate levels are also harmful to aquatic life. R7108, R7232, R7233, R7413. The record demonstrates that existing regulatory controls are inadequate. As a member of the MPCA technical staff team noted: “[i]n this watershed the status quo is not good enough regarding nitrates, a reduction is needed as the status quo only adds to the problem in the watershed.” R9455. MCEA agrees. In fact, there is no information in the Administrative Record to the contrary. MPCA admits that the surface waters are polluted by nutrients, sediments, nitrate, and bacteria, and that “feedlots and associated land application of manure” contribute to current impairments. R4216-7.

The MPCA’s feedlot rules themselves acknowledge that, under certain conditions, an MMP must describe additional protective measures, i.e., actions beyond the standard agronomic rates, phosphorus testing, application methods, manure testing, and setbacks already required by the rule. A permit applicant must submit an MMP that includes:

- a description of protective measures to minimize the risk of surface water and groundwater contamination when applying manure or process wastewater in a floodplain, special protection area, *soils with less than three feet above limestone bedrock*, drinking water supply management areas where the *aquifer is designated vulnerable* under chapter 4720, and land within 300 feet of all surface tile intakes, *sinkholes* without constructed diversions, and uncultivated wetlands. *Protective measures include, but are not limited to, soil and water conservation measures, timing of application, methods of application, manure application rates, and frequency of application*;

Minn. R. 7020.0225, subp. 4(D)(9)(emphasis supplied). If the protective measures were merely those included in the rule itself *(see Minn. R. 7020.2225, subps. 6-8)*, there would be no need for MPCA require the applicant to include this description in its plan. Bolstering this interpretation, MPCA’s own manure management guidance publication summarizes the requirement of the rule but then specifically notes that “County and/or NPDES permit requirements may be more restrictive.” Exhibit 9 at 38.
There is no dispute that the manure application sites proposed by Daley Farms involve special protection areas, sites with less than three feet of soils above limestone bedrock, and sinkholes without constructed diversions. R.04214. In its EAW findings, MPCA finds:

106. Manure land application sites 1, 2, 5, 9N, 10, 11, 12, 23, 24, 27, 29N, 32, 33, 34, 45, 36, 39, 40, Lappier's, and Matt's contain or are near mapped sinkholes. Open sinkholes may provide direct access of surface pollutants, such as nitrate dissolved in water, to groundwater through fractured bedrock. At these sites, Daley will follow manure application practices and setbacks required in the Individual NPDES Feedlot Permit or Minn. R. 7020.2225, subp. 8, as applicable.

107. Manure land application sites 3, 4, 5, 6, 8, 9N, 9S, 11, 12, 13, 19, 20, 21, 22, 24, 25, 26, 27, 28, 32, 34, 36, 39, 41, Lappier's, Matt's, and Orlies contain soils developed in bedrock, described as shallow bedrock in soils. Shallow bedrock provides greater risk of pollution leaching to groundwater since there is less soil to absorb and treat pollutants before reaching bedrock.

In fact, on certain fields, the amount of land that is not subject to some form of a restriction is less than 27 percent. See Exhibit 10 (GIS study of example field). Under these circumstances, MPCA should have concluded that special conditions were necessary, not optional, as its own guidance suggests. See Exhibit 9 at 38 (“consider developing a management strategy” indicated where “shallow soils over bedrock” are present).

Expert soil scientist Dr. Gyles Randall strongly agrees that the “status quo” will not work in this area and additional conditions are required. He states:

This is a unique agricultural area of the state in terms of its susceptibility to greater nitrate-N levels in the groundwater. It receives more precipitation than any other area of the state. The highly productive silt loam soils with good internal drainage show a high potential for leaching of nitrates to the groundwater. Groundwater storage is primarily found in rather shallow sandstone and limestone formations, with no layer of fine-textured soil restricting leaching from the silt loam surface soils to the groundwater storage areas. Water in the storage formations can move laterally into springs that contribute water to small streams. Many rural drinking water wells exist. Livestock producing significant manure N and corn requiring substantial fertilizer N dominate the agricultural area. The landscape consists of some rather level areas along the western side, a large area of moderately rolling soils with gentle to somewhat steep slopes in the central area, and a large area of steeply dissected soils dominated by forests along the eastern edge. Thus, with abundant precipitation and silt loam soils, soil erosion is also prevalent, especially
with tilled row crops grown on steeper slopes. Under these conditions, additional guidelines and practices are required to limit contamination of groundwater by nitrate-N from livestock manure and fertilizer and contamination of surface water by nitrogen, phosphorus, and manure runoff. Environmental protection is not just a given in this part of the state, it needs the wide adoption of additional practices to help protect this landscape from long-term degradation.

Exhibit 1 at 9 (emphasis added).

Under the present circumstances, MPCA cannot find that mere compliance with the agronomic rates, testing and setback requirements in its existing rules provides adequate protection for the environment. As noted above, MPCA has the authority to impose special conditions, and must do so when existing rule conditions are not adequate to protect water quality standards. Minn. R. 7001.0150, subp. 2 (“[e]ach draft and final permit must contain conditions necessary for the permittee to achieve compliance with applicable Minnesota or federal statutes or rules, including each of the applicable requirements in parts 7045.0450 to 7045.0649 and 7045.1390, and any conditions that the agency determines to be necessary to protect human health and the environment.”) MPCA’s own technical staff and its own rule support only the conclusion that special conditions are necessary in the area where the Daley Farms expansion is proposed. The only question is whether or not the special conditions that MPCA has included in the Daley Farms permit are adequate to protect human health and the environment. Whether the special conditions do so is a material issue of disputed fact.

2. The “pick two” special conditions are not consistent with the MPCA’s own technical team’s recommendation.

With regard to this permit, MPCA relies on the “pick two menu” of special conditions to support its issuance of the permit in the face of numerous comments pointing out that management
of the large volume of manure\textsuperscript{9} created by the project will harm already degraded surface and ground waters. R1822. But, as will be shown below, the ability of the “pick two menu” to ensure that Daley Farms will mitigate the potential for nitrate pollution from this project is disputed by expert opinion and other evidence. This evidence supports that only changes to the “rate” of application allowed under the manure management plan will have a significant impact on nitrate pollution from this project. As a result, the “pick two menu” must be substantially amended or MPCA must grant a contested case hearing to develop a record regarding the “pick two menu” and whether it will be effective.

In discussing the enhanced threat of nitrate pollution posed by the Daley Farms expansion, the MPCA technical staff team developed the list of options which are now found in the “pick two menu” of the permit. R9455-8. But the MPCA technical team did not recommend these options as a “pick two menu.” In fact, the MPCA technical team only thought that a reduction in nitrate leaching could be achieved if certain options are used together. On October 5, 2018, the MPCA technical staff manager summarized the conclusion of the internal discussion:

We could see some reduction in N leaching, at least at the farm level, from implementation of the following:

- Apply manure in the fall after soil temps are below 50 degrees, along with the N inhibitor/stabilizer product, and employing a split application system whereby the proposer would limit the amount applied to 100#/s/N (fall applied) and then apply the remaining N needs for the crop at planting and/or side dress or herbicide program. From an ease of management, implementation at the farm scale and a risk management standpoint, this type of program has a good chance

\textsuperscript{9} In its findings, MPCA touts the benefits of using manure. R1823 (EAW Findings 44-48). But what MPCA fails to acknowledge is this: while commercial fertilizer can be adjusted based on weather and crop conditions and can be stored (or not purchased) when not needed, animals generate manure whether it is needed or not. As a result, the producer must utilize this manure whether soil and crop conditions support its use or not, lest manure storage capacity at the production site be exceeded and spills result. Similar, while commercial fertilizers cost money to apply, manure is essentially “free” and not subject to a cost limitation, removing (in part) the cost incentive to limit its use.
This approach is supported by research to show improvements in N loss due to leaching and plays directly into the 4R’s of nutrient management, right rate, right source, right time, and right place.

R9457 – 8 (emphasis added). The technical staff team manager added that:

- Cover crops could play a huge role in reduction of leaching at the farm scale. However, as mentioned above, there are inherent risks in implementing it holistically at a farm scale. I think it is a strategy that is proven to work and improve soil N loss, and new research also shows a long term benefit of increasing yields (after 3 – 4 years.)

Id. On October 19, 2018, the East Unit Feedlot Supervisor updated the previous recommendation by noting that, for cover crops,

if the establishment was 80% or higher on acres receiving manure could play a huge role in reduction of leaching at the farm scale especially with manure that is applied in the fall. There are inherent risks in implementing it holistically at a farm scale. Fall conditions for establishment of a cover crop can be difficult to implement, perhaps looking at a strategy of establishment earlier in the growing season. . . a “plan B” may need to be implemented if cover crops could not or were not established at a success rate of 80%. This might mean looking a bullet one and or spring applying manure as a reduction risk strategy. . . .

R9453.10 This record demonstrates that the “pick two menu” MPCA ultimately adopted as a special condition does not reflect the recommendations of its own technical staff team, which (as noted above) suggested the conditions as a package, not a menu.

3. The “pick two menu” is confusing and will not result in significant risk reduction.

The “pick two menu” choices will also not be effectively enforceable, and may not result in even the minimal decrease in nitrate pollution risk MPCA evidently believes they will achieve.

10 MPCA’s land application rule supports only the use of cover crops established earlier in the growing season. The rule specifies that an MMP provide information on the “type of cover crop to be planted when manure is to be applied in June, July, or August to fields that have been harvested and would otherwise not have active growing crops for the remainder of the growing season.” Minn. R. 7020.0225, subp. 4(D)(13). No provision is made for cover crops for manure applied after August applications, which implies that MPCA understood that cover crops may be unreliable after that time, as the staff comment suggests.
Under condition 1, Daley Farms must delay manure application until the soil temperature is below 50 degrees. R4227. As Dr. Randall notes, this condition is unclear. Does MPCA mean “on average” or simply that an occurrence of soil temperature of 50 degrees or less has occurred, which could be for as little as a day or a portion of a day? Exhibit 1 at 5. As a result, this condition, as drafted, cannot be effectively enforced, and should be modified to specify a date. Logically, this condition can be combined with condition 2, which requires the use of a “nitrogen stabilizing additive,” or condition 7, “avoiding application of manure of field areas that are shallow to bedrock (less than 40 inches).”

If Daley Farms chooses not to delay manure application until the soil temperature is below 50 degrees, Condition 3 requires Daley Farms to use a “nitrogen stabilizing additive.” But Daley cannot rely on Condition 6 (avoiding shallow soils) as its second condition under the terms of Condition 6. Similarly, if Daley is applying the manure to warm soils in the fall, Daley cannot rely on Condition 5 as a second condition, because Condition 5 requires spring application. Similarly, if Daley is applying the manure to warm soils in the fall, it cannot split its application, as required by Condition 6. Use of the inhibitor is already required. Thus, warm soil application must be combined with a cover crop (Condition 4). But it is unclear whether MPCA means to require both a nitrogen stabilizing product and a cover crop. And if Daley Farms uses a cover crop for early fall application (Condition 4), it is allowed to combine that with Condition 7 (avoiding application on shallow soils). But Condition 4, the cover crop, does not address the MPCA technical staff’s concern with what needs to be done if there is a cover crop failure.

Finally, the menu is also unclear with regard to condition 5 (“apply manure in the spring”) and condition 6 (split manure application between fall and spring). Does the split application satisfy condition 5 because some manure is applied in the spring? Or was MPCA’s intent that
option 5 require *all* manure to be applied in the spring, but failed to include the essential modifier? If all manure is applied in the spring, must a stabilizer be added (condition 2)?

In its findings, MPCA cites to no scientific research that supports that these special conditions—alone or combined as a pair—will significantly reduce the environmental risk posed by manure application under the conditions prevalent on the manure application sites. As noted above, the conclusion of the MPCA’s technical staff was that the conditions would reduce risk if employed as a package. But the most important point is this: even if consistently combined and applied, these menu options will do little to reduce risk if the rate of application is too high. Based on the scientific research that has been conducted, only controlling the rate of application significantly reduces the threat of nitrogen pollution.

4. **The MPCA’s special conditions are not an effective means of controlling nitrate pollution compared to establishing the correct rate of application.**

As noted above, Dr. Randall’s expert opinion is that MPCA is relying on an outdated recommendation for the “agronomic rate” of nitrogen application and uptake which results in an excessive and risky level of manure application. Dr. Randall also holds the opinion that the special conditions will do little to control nitrate pollution from the proposed application because the rate of application is the most significant factor, not source, timing, or method. As Dr. Randall notes:

> We’ve all heard of the 800-lb gorilla in the room, but with manure two other critters are in the room – a pit bull and a chameleon. **Rate** of N applied is the 800-lb gorilla because it exerts a consistent and much greater impact on crop yield and water quality than the other critters. Applying excess N leads to poor economic return and greater losses of nitrate to receiving waters resulting in serious water quality concerns.
Exhibit 1 at 1 (emphasis in original). Time of application is the “chameleon” because it has “little effect on water quality.” Id. Dr. Randall also concludes that “[l]iquid dairy manure applications in the late fall and early spring are expected to show little difference in nitrate loss affecting water quality. This is particularly true of dairy manure, which has a greater amount of organic N than hog manure, and thus is slower to mineralize to nitrate N.” Id.

With regard to the “pick two menu” practices, Dr. Randall notes that, in his opinion:

the additional practices in this list are creatively diverse, lack research evidence providing support, rather risky in terms of success, take additional time to facilitate their inclusion, and do not focus on practices that provide consistence year after year. Some will work and will provide benefits if weather and growing conditions are favorable. Research data from other practices suggest them to be inconsistent and therefore risky. Because of complicating and unintended effects, other practices could put the dairy expansion proposal at risk. Some are time consuming and may not make meaningful differences.

Id. at 4.

Dr. Randall notes that Condition 1 (delay application until soils are below 50 degrees) will only be affective at reducing nitrate production for 40 percent of the nitrogen content of manure application due to the type of nitrogen present in liquid dairy manure. Id. at 5. Dr. Randall further points out that determining soil temperatures for permitting fertilizer or manure application has been a challenge due to a variety of factors. He points out that soil temperatures are not reliably lower than 50 degrees in Waseca (for example) until after October 25. Dr. Randall therefore recommends a calendar date based on long-term data for this practice. Id.

Dr. Randall notes that nitrogen stabilizers have been studied over the past 40 years and that the results have been very inconsistent. Id. He notes that Minnesota has had many positive results with corn yields, “but with little effect on reducing nitrate-N losses to tile drainage water.” Id.

Id. at 4.
Iowa does not recommend nitrogen stabilizers. At this time, Dr. Randall does not recommend this practice. Id.

With regard to Condition 3 (requiring a nitrogen stabilizer when applying to warm soils), Dr. Randall notes that the effectiveness of some inhibitors may decline if applied early. He notes that this practice may be effective if combined with a cover crop planted before September 20, but this needs further research. Id.

For Condition 4 (cover crop), Dr. Randall notes various “challenges” that would have to be addressed, but concludes that, in his opinion, “seeding a viable cover crop after Sept. 20 would be a risky practice with less potential for adequate growth, limiting uptake of nitrates from the mineralized manure, regardless of when the manure was applied.” Id. at 6.

For Condition 5 (spring application), Dr. Randall notes that if “weather, soil and crop production practices are ideal” this practice is the best of the seven practices proposed. But this practice would mean that the farmer must hold all manure over the winter, which creates an issue if a cold and wet spring occurs when the lagoon must be emptied. Dr. Randall also comments that spring application of manure could reduce yields resulting in poorer N uptake efficiency, and greater potential for nitrate losses that could make the practices less effective than fall application. Id.

Dr. Randall believes that Condition 6 (split application), could work under certain conditions, but further holds the opinion that the practice would be a “nightmare” if applied across the all Daley Farm fields due to the difficult field conditions (uneven, curved edges, are not square or rectangular, and require attention to detail). Id.

Finally, Dr. Randall believes that Condition 7 (avoiding application of manure on areas that are less than 40” of soil over bedrock) is the most desirable of the practices but because such
soils occupy a small area (about 1 percent), the practice would be of minor importance in terms of reducing nitrates in groundwater for the total project. *Id.* at 7.

Dr. Randall further recommends MPCA consider certain other restrictions, including a restriction on application to Sogn and Frankville soils, and on slopes greater than 6%. These restrictions are recommended because the proposed chisel plow or heavy disk tillage may lead to increased erosion.

Dr. Randall’s overall conclusion is that:

Applying the proper agronomic rate of N is the most consistent BMP because it works each year and provides an additive effect over the years. If manure is applied at a rate exceeding the MRTN, nitrate-N levels in the soil profile will escalate because the N is being applied in excess of what the crop needs. In my professional opinion, applying dairy manure to a Port Byron or Mt. Carroll soil at a rate 10% below the MRTN would provide reduced nitrate-N carryover and leaching loss while providing excellent corn yields. In the future, more effective and versatile cover crops may be developed along with more highly effective and consistent nitrification inhibitors will enhance the performance of fall-applied manure.

*Id.* at 7. Based on Dr. Randall’s comments, the MPCA’s “pick two” menu will not be adequate to sufficiently reduce the risk this project will create. MPCA should order a contested case hearing because these conditions are material to whether the permit will include the “conditions necessary for the permittee to achieve compliance with all Minnesota or federal statutes or rules.” Minn. R. 7001.1080, subp. 1.

C. **Certain Fields Identified For Manure Application Are Too Risky And Should Be Eliminated From the Manure Management Plan.**

In his October 2018 report, Dr. Randall opined that of the 44 sites Daley Farms has identified for manure application, ten are “poor” as the result of shallow soils,\(^{12}\) slopes, 

\[^{12}\text{Soils with less than 40” of soils over bedrock are considered “shallow.” Although there are no rule restrictions prohibiting use of fields with shallow soils, MPCA recommends that producers “[a]void fall applications to areas with shallow soils over bedrock if possible” or if it must be done, “wait until average daily soil temperatures at a six-inch depth are below 50 degrees F.” Exhibit 11 at 10.}\]
topography, karst features, and water courses. As a result, Dr. Randall questioned whether these sites were appropriate for manure application, stating “[c]ustom manure applicators prefer to apply manure in a pattern where they go back and forth from end to end working their way either to the right or to the left across the field. This pattern provides the most uniform application where all areas receive manure and skips are rare.” Dr. Randall concludes “[u]niform pattern application will be very difficult on many of these designated MAS.” Dr. Randall noted that “[t]hese findings lead one to seriously question whether there are enough acceptable soils in this proposal to receive the manure produced from this dairy expansion project without significant and unacceptable surface water contamination (sediment, manure, and pathogens) or ground water pollution (nitrate- nitrogen).”

In its 2018 findings, MPCA concedes that the manure application fields are poor, but argues that because the fields are technically eligible for manure application (MPCA’s rules contain no limiting criteria) it would be better for the fields to be part of the Daley Farms MMP because otherwise these fields might receive manure applications from small producers who are not required to have a manure management plan. This rationale is disturbing. First, all persons applying manure are required to comply with the agronomic rate limitation and setbacks. Minn. R. 7020.0225, subp. 3. Second, Daley Farms owns or controls a large number of these fields and thus there is no reason why MPCA could not have (as a condition for approval of the permit) required Daley Farms to locate less risky land. Third, including the risky fields in the MMP virtually ensures their intensive use by

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13 Although all feedlots are limited to application at agronomic rates and subject to setbacks, only animal feedlots with the capacity of 300 or more animal units are required to have an MMP. Minn. R. 7020.2225, subp. 4.
the Daley Farms project. Finally, even though the MMP would ensure theoretical limits on manure application, as Dr. Randall observes, MPCA fails to acknowledge that only a highly qualified certified agricultural waste technician (“CAWT”) could apply manure in the oddly shaped parcels in a manner that results in the “uniform application” of manure nutrients necessary to achieve compliance with the “agronomic rate” requirement in the rule. R2911. See also Ex. 1 at 8.

There is no question that many manure application sites are risky. For example, Daley Farms claims that “Hole Pasture 20” will provide 34.4 acres for manure spreading. R6447. But, as can be seen from the picture on the next page, the Hole Pasture 20 MAS is riddled with areas of shallow soils, intermittent streams, and a well setback, and only a very small percentage of this area is actually available for unencumbered manure application.
MANURE APPLICATION NOTES:
Winter application is NOT permitted within 300' Buffer or slopes greater than 6%.
Non-Winter application within 300' Buffer needs 100' grass buffer on rivers and lakes, or 50' grass buffer on all other waterways. If insufficient buffer or within Tile Intake Buffer you must incorporate immediately.
There is NO application within 25' of any waterway and within 100' of all wells.
If soil tests exceed 21 ppm Bray/16 ppm Olsen in 300' Buffer, Phosphorus must be applied at crop removal rates.
Similarly, “Hole Small 21” suffers from similar problems, yet is claimed to provide 17.1 acres available for manure management:
S Farm Pasture 28 is claimed to provide 66.3 acres for manure management. But from the image provided, only a tiny oddly shaped area is actually available for unrestricted manure application. The rest of the site is risky.
See Exhibit 10. Of the Daley Farms-owned fields identified in the MMP, 23 are affected by a “public well management area,” 19 have shallow bedrock, 22 are affected by an intermittent stream, and 8 have a sinkhole present. R6269. Significant numbers of sinkholes are present just outside of the designated manure application areas. See, e.g., R6282, R6283, R6299, R6309, R6318, and R6320.

Dr. Randall recommends that the MPCA require amendment of the MMP to eliminate application on sites 3, 4, 8, 20, 21, 22, 25, 27, and 28). Exhibit 1 at 9. He recommends elimination of these sites because they should be considered to be unusually sensitive. The sites involved shallow soils to bedrock (<40”), many D slopes (>12”), and extensive setbacks with Karst features, intermittent streams, wells, and water ways. These features resulted in limited land areas for manure application. He noted that these 9 sites appeared to be most environmentally vulnerable in terms of nitrate-N contamination of groundwater and sediment and P losses to surface water. Exhibit 1 at 9-10. Dr. Randall also recommends restriction on application on shallow soils or in areas of highly erodible soils, i.e., certain where steep slopes are present. Id. at 10. Finally, Dr. Randall notes that of the manure application sites, only two tested less than “very high” for phosphorus in the soil. Id. at 10. Dr. Randall notes these high levels as a concern because:

the extremely high [soil phosphorus] values on many of the [manure application sites] that will continually receive copious amounts of manure presents a concern. If 35 million gallons of dairy manure are applied each year to the [manure application sites] and the manure contains 10 lb of P2O5/1000 gal, then a total of 35,000 lb of P2O5 will be applied each year to already very high [soil phosphorus] soils. If downward movement of dissolved, reactive inorganic P moves through the soil profile and into the groundwater aquifer, a substantial environmental problem similar to Ohio could occur.

Id. at 11.

The “agronomic rate” limitation and Minn. R. 7020.2225’s various setback limitations are illusory if, as a practical matter, the application of manure cannot reliably be done in compliance
with the applicable limitations or can only be applied on risky sites. Whether or not the manure application sites can reasonably be used for the application of manure as required under the rule is a material issue with regard to whether MPCA can find that the issuance of the NPDES to Daley Farms will result in compliance with Minn. R. 7020.2225. MCEA has submitted expert opinion on whether the manure management plan, as drafted, will result in compliance with the agronomic rate limit and other limits established in Minn. R. 7020.2225. As a result, MPCA must require Daley Farm to eliminate the poor sites from its MMP and find sites more reasonable for application of manure, or MPCA must order a contested case hearing at which evidence going to this issue can be introduced and assessed by an administrative law judge.

D. The MPCA Must Require Nitrate Monitoring And Testing.

Under its permitting rules, the MPCA is required to include:

B. Requirements for monitoring and testing and reporting of monitoring and testing results. Monitoring and testing requirements must specify the type, interval, and frequency of monitoring and testing activities that are sufficient to yield representative data to determine whether there is compliance with the terms and conditions of the permit or compliance with Minnesota and federal pollution control statutes and rules. . . .

Minn. R. 7001.0150, subp. 2.B. The MPCA’s land application rule only requires soil testing to determine phosphorus levels in land application fields but is silent on nitrate soil testing. See Minn. R. 7020.2225, subp. 3.C. Only testing of the nitrogen content of the manure to be applied is required. Minn. R. 7020.2225, subp. 2. As a result, although the rule requires that manure must be applied at “agronomic rates” per the MMP (Minn. R. 7020.2225, subp. 3.A.), whether the nitrogen that was applied in the prior year has actually been absorbed will not be known. Whether nitrogen is utilized can be affected by many factors, including climactic conditions, including conditions that may be changing as the result of climate change, and these changing conditions may make existing problems worse. Exhibit 12. As noted above, manure is particularly difficult to assess as
it degrades to nitrate over a period of years. As a result, even if the MMP is followed, without actual soil test data, it will not be known whether or not the manure application rate is truly “agronomic.”

Despite the risky conditions under which this project seeks to proceed, MPCA has included no requirements in the permit for nitrogen soil testing or monitoring that would allow the MPCA or Daley Farms to determine whether the MMP is successfully controlling nitrate buildup and migration into the groundwater under the unique conditions in the area of the proposed expansion, i.e., karst topography with existing high nitrate groundwater. Under Minn. R. 7001.0150, subp. 2.B, such monitoring and testing is required. Moreover, a permit requirement to include such monitoring and testing would be consistent with recommendations of the University of Minnesota and other academic institutions, including Iowa State University and the University of Wisconsin. The University of Minnesota recommends a spring preplant nitrate-N test if conditions exist for residual nitrate to accumulate, such as when manure is used in the fall, particularly as part of a corn following corn rotation. Exhibit 13 at 7. The University recommendations note:

South-central, southeastern, east-central Minnesota Research has led to the inclusion of a soil NO3 - -N test to adjust fertilizer N guidelines in southcentral, southeastern, and east-central Minnesota (non-shaded areas of Figure 2). This test, in which soil NO3 - -N is measured in the spring before planting from a two-foot sampling depth, is an option that can be used to estimate residual N. In implementing this test, the user should first evaluate whether conditions exist for residual N to accumulate. Factors such as previous crop, soil texture, manure history, and preceding rainfall can have a significant effect on accumulation of residual N.

Exhibit 4 at 17. Iowa State University specifically notes that such testing is a means of reducing environmental degradation:

The late-spring test for soil nitrate is a new technology that enables site-specific assessments of plant-available N just before the crop begins rapid uptake of N. Use of this test should help corn producers manage N to increase their profits while reducing environmental degradation.
Exhibit 14 (emphasis added). And the University of Wisconsin’s Guidelines for Applying Manure to Cropland and Pasture in Wisconsin state:

Manure N can be lost or released more slowly than expected, so growers may wish to confirm that the expected amount of manure N is available to the crop by using the pre-sidedress soil nitrate test. *This test is especially valuable when most or all of the crop’s N needs are expected to come from manure N.*

Exhibit 15 at 7 (emphasis added).

MPCA must include annual field testing for nitrogen (using a grid testing method such as suggested in the University of Iowa publication cited above) because its rules compel inclusion of adequate testing and monitoring and because the particular circumstances of this proposal require such testing to ensure that existing polluted conditions are not made worse.

**III. CONCLUSION**

The Daley Farms MMP remains deficient for the following reasons:

(1) The MPCA’s manure application rule limits “application rates” to “expected crop nitrogen needs.” Minn. R. 7020.2225, subp. 3(A). The rule further states that “[e]xpected crop nitrogen needs, crop nitrogen removal rates, and estimated plant available nitrogen from manure and legumes must be based on the most recent published recommendations of the University of Minnesota Extension Service or of another land grant college in a contiguous state.” Minn. R. 7020.2225, subp. 3(A). The MMP is not based on the most recent recommendation of the University of Minnesota for the “agronomic rate” and fails to credit prior year’s manure applications. As a result, the MMP will allow application of manure at levels that will result in increasing soil nitrate levels that will impact ground and connected surface waters. MPCA must require Daley Farms to amend the MMP to utilize an agronomic rate that is not excessive and that properly credits manure applied the previous season. If MPCA does not make these changes, it
must order a contested case hearing on whether the MMP as proposed complies with Minn. R. 7020.2225.

(2) Under Minn. R. 7020.0225, subp. 4(D)(9), the MMP is required to describe “additional protective measures.” See also Minn. R. 7001.0150, subp. 2 (“[e]ach draft and final permit must contain conditions necessary for the permittee to achieve compliance with applicable Minnesota or federal statutes or rules, including each of the applicable requirements in parts 7045.0450 to 7045.0649 and 7045.1390, and any conditions that the agency determines to be necessary to protect human health and the environment.”) The “pick two menu” of special conditions will not reliably achieve any significant decrease in nitrate risk because only the appropriate “rate” of application is truly significant, and the “pick two” conditions are otherwise of limited reliability and cannot be applied or enforced as currently drafted. Instead of incorporating the “pick two menu,” MPCA should amend the permit to limit the rate of application and require Daley Farms to use the pick two conditions as a group, as recommended by its own staff. If MPCA does not make these changes, it must order a contested case hearing on the adequacy of the permit to protect the environment.

(3) MPCA’s rule requires manure to be applied at “agronomic rates” per the MMP (Minn. R. 7020.2225, subp. 3.A.), but a significant percentage of the fields identified for manure application cannot reasonably be used for manure application without creating excess risk of misapplication (i.e., failure to apply at agronomic rates), and manure application on these fields enhances the risk of nitrate contamination. The risky fields should be eliminated from the MMP. If MPCA does not make these changes, it must order a contested case hearing on the adequacy of the permit to protect the environment.
(4) MPCA’s rule requires manure to be applied at “agronomic rates” per the MMP (Minn. R. 7020.2225, subp. 3.A.), but whether the nitrogen that was applied in the prior year has actually been absorbed will not be known. Under Minn. R. 7001.0150, subp. 2.B, MPCA is required to include monitoring and testing. The permit must include soil nitrate monitoring and testing requirements sufficient to determine compliance and lacks such conditions with regard to compliance with the agronomic rate limit required under the rule. If MPCA does not add these conditions, it must order a contested case hearing to determine if the permit complies with mandated monitoring and testing requirements.

The issues listed are “material” to whether the permit as drafted complies with Minn. R. 7020.2225 and the findings that MPCA must make when issuing any permit, which is that it will result in compliance with standards, including water quality standards. MCEA has identified changes that MPCA must make to the permit to address these issues. MCEA has supported its position with expert opinion and scientific studies, including statements from MPCA’s own technical staff. If MPCA does not require the changes identified in this comment, MCEA is entitled to a contested case hearing under which it can present evidence and create a record.

Respectfully submitted,

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Exhibit 1
This review of the Manure Management Plan and NPDES draft Permit 2020-1-21 follows my earlier review of the original Daley Farms LLP Proposed Dairy Expansion in November 2018.

My training at the U of MN (M.S.) and U of WI-Madison (PhD) was focused on soil fertility and plant nutrition. My 39-yr research and outreach program out of the Southern Research and Outreach Center at Waseca focused on nutrient management, primarily nitrogen (N) from fertilizers and manures for corn. A portion of that field research was conducted on the Port Byron and Mt. Carroll soils of southeastern Minnesota – the same soils as the dairy expansion is being proposed. Numerous research papers were published on the role of N management on corn yields and the leaching and losses of nitrate-N. In addition, I was instrumental in starting the 6-state mission to revise N rate recommendations for corn in the North Central states and served as a co-author of the first publication describing the MRTN approach. My research program supplied much of the data from the soils of SE and SC Minnesota upon which the N rate recommendations were built. Our manure studies involved fall, spring, and in-season applications of both solid and liquid dairy manure, liquid hog manure, and turkey litter for corn.

After reading the latest MMP and portions of the NPDES and EAW, I am impressed with the scope, engineering details, and organization of this very complex dairy expansion proposal, but am concerned with some of the nutrient management aspects. My goal in this review was not to throw the Daley LLP proposal under the bus, but simply was to improve the proposed manure application practices so that water quality (primarily nitrate losses to groundwater) was not impaired significantly by land application of liquid dairy manure.

Nitrogen (N) management for crop production centers around four basic factors: (1) rate of N applied, (2) time of application, (3) source of N, and (4) method of application (commonly called the 4 R’s). Since this proposal deals with liquid dairy manure as a source of N, there are three R’s in play. From an agronomic standpoint and an environmental standpoint, which N management factor is most important? Let me use an analogy. We’ve all heard of the 800-lb gorilla in the room, but with manure two other critters are in the room – a pit bull and a chameleon. Rate of N applied is the 800-lb gorilla because it exerts a consistent and much greater impact on crop yield and water quality than the other critters. Applying excess N leads to poor economic return and greater losses of nitrate to receiving waters resulting in serious water quality concerns. Method of application is represented by a 40-lb pit bull. If the manure is injected or readily incorporated, the pit bull is calm and friendly, exhibiting no bodily harm and no impact on yield or water quality. When manure is not incorporated and left on the soil surface, the pit bull becomes feisty and angry, crop yields are reduced, odor is increased, and surface water quality can be harmed. In the Daley LLP case, method of application becomes a non-factor because they plan to knife-inject all of the liquid manure. Time of dairy manure application, whether it be in October, November, or April has little effect on water quality but may affect crop yields if fine-textured soils are too wet, especially in the spring. Thus, a 10-pound chameleon is symbolic of time of application for liquid dairy manure. Although a few people may freak out with a chameleon in the house, most are not affected. Liquid dairy manure applications in the late fall and early spring are
expected to show little difference in nitrate loss affecting water quality. This is particularly true of dairy manure, which has a greater amount of organic N than hog manure, and thus is slower to mineralize to nitrate N. Crop yields, however, can be reduced when manure is spring-applied, especially if the soils are wet and severe soil compaction occurs. Also, if manure applications are delayed into May, corn yields may suffer due to late planting. Weather abnormalities in the spring these last few years have impacted manure application with severe soil compaction on wet, poorly drained soils, causing poor plant growth marked by areas or fields of smaller yellow corn plants that can be seen for much of the summer. This would be similar to the chameleon that changes color depending on certain conditions. Under these conditions, utilization of manure-N by corn is limited and nitrate leaching losses could be increased.

The above analogy of three animals in the manure-application room casts a clear picture as to why I am concerned about this proposal. Much effort has been given to time of application (the chameleon) to reduce nitrate leaching losses to groundwater and very little attention to the 800-lb gorilla. Rate of N application regardless of source (manure or fertilizer) drives the amount of nitrate-N in the soil each year and hence potential annual leaching losses. In these well-drained silt loam soils located in the wettest area of the State, leaching potential of nitrate-N from excessive rates of manure-N application is very high.

Two factors have a great influence on the final rate of manure-N applied. First, the amount of N (lb N/1000 gal) in the manure to be applied has to be known. It can’t be estimated, and a “book” value can only be used to make preliminary decisions. The Daley’s will be using a sand-based manure system, which is rather new in Midwest dairies. I have not seen any published values or “book” values for N content of sand-based manure. I strongly suggest the Daley’s obtain N content values from current operational sand-based systems wherever they may be located and use them as “temporary” values when making manure rate applications in this proposal. I do not anticipate the Daley’s having sand-based manure containing anywhere close to 31 lb N/1000 gal (the “book” value for liquid dairy manure) in their operation. The proposal indicates they will be washing the sand from the manure, and the wash water will dilute the N content. Furthermore, the N content may vary considerably from higher concentrations when hot and dry conditions evaporate water from the storage lagoon to much lower concentrations if the Daley’s use considerable amounts of wash water and/or if a very high-rainfall summer occurs. For this reason, adequate sampling to determine N content of the lagoon manure must occur each year.

The second factor having the ultimate effect on how much manure will be applied per acre is simply deciding, based on N recommendation guidelines, how much N will be needed to optimize crop yield. Midwest universities use the MRTN (Maximum Return to Nitrogen) method to determine the rate of applied N that produces the maximum economic return for selected prices of fertilizer N and corn. Under present corn production systems, this ratio of N price divided by corn price is about 0.10 or very close to it. In other words, it is simply a method used to determine the economic optimum fertilizer N rate for corn based on 70 University of Minnesota field research trials. The MRTN for these 70 trials is 165 lb N/acre regardless of N source -- fertilizer N or plant-available manure N. The University also calculates the range of N rates where the economic optimum return is less than $1/acre below the maximum return. In this case, the MRTN value of 165 is surrounded by application rates from 152 to 180 lb N/acre, which provides the range where economic return to N is reduced no more than $1/acre and is considered economically acceptable.
In summary, the MRTN method contains no environmental interpretation other than supporting documentation stating from time to time “the MRTN value minimizes leaching losses of N”. This cautionary statement is true because applying N rates >165 lb N/acre results in greater potential leaching losses of nitrate-N. Farmers sometimes feel the MRTN value maybe too conservative and some retail dealers and consultants are willing to recommend higher N rates to keep the customer “happy”. Thus, the statement “minimizes leaching losses” serves only as an environmental reminder of what occurs as greater rates of N are applied.

In reviewing the Daley Dairy Expansion proposal and MPCA documents, I find the maximum MTRN values for corn after corn to be 195 lb N/acre (Manure Nitrogen Rates for Corn Production) and 180 lb N/acre (Manage Manure Applications to Protect Water Quality and Save Money). In my opinion, these excess rates of 15 and 30 lb N/acre will not protect water quality.

Comments about the proper fertilizer cost to corn value ratios are found in various reference materials for manure N application for corn. When manure is considered to be of little value, a ratio recommendation of 0.05 is given as opposed to the traditional 0.10 ratio for fertilizer N. Lowering the ratio to 0.05 raises the MRTN value to 195 lb N/acre and the “acceptable range” then becomes 175 to 210 lb N/acre. In my opinion, these 30 to 45 lb N/acre excess N rates will likely lead to severe leaching losses of nitrate-N to groundwater. In the MPCA website entitled “Manure N Rates for Corn Production”, a 195 lb N/acre Maximum MRTN is suggested with a following comment indicating this should probably be reduced if environmental concerns exist. A University of Minnesota website article entitled “Guidelines for Manure Application Rates” states the N rate for non-irrigated corn is 195 lb plant-available N/acre for corn after corn. No cautionary statement about environmental concern is included. Another UM website article also suggests the 0.05 ratio and the 195 lb N/acre application rate. In the last line of the accompanying text following the 195 lb/acre rate, a short sentence indicates the N rate could be reduced if economic or environmental issues exist. This collection of N rates when manure is applied is confusing at best.

The Daley LLP dairy expansion proposal clearly demands the need for applying an optimum N rate that meets high agronomic, economic, and environmental standards. The simple fact that this proposal suggests over 35 million gallons of liquid dairy manure per year will be applied by the Daley operation for corn grown on well-drained soils in a relatively small area of Winona County is of concern, especially since numerous drinking water wells in this area and the Utica drinking water supply management area show nitrate-N concentrations exceeding the U. S. Public Health standard of 10 mg nitrate-N/L due to past applications of fertilizer and manure to crops. Consequently, fall application of fertilizer N is not allowed in this area of Minnesota. Therefore, the MRTN agronomic rate of 165 lb N/acre obtained with a 0.10 ratio is strongly recommended. Applying 30 to 45 lb of excess N for corn grown on these soils with high leaching potential would be an environmental disaster linked to the Daley dairy expansion.

Nitrogen application rate studies conducted on Port Byron and Mt. Carroll soils in southeastern Minnesota often include determining the amount of nitrate-N that remains in the 0-5’ soil profile in the fall from the spring-applied N after corn has been harvested. Residual nitrate-N from the spring-applied N increased slowly in the soil profile as application rates increased toward the economic optimum N rate. As the application rates reached the optimum N rate and beyond, residual nitrate-N amounts in the soil were increased exponentially. Therefore, even at the MRTN rate some excess nitrate occurs, but with application rates above the MRTN excess levels of nitrate occurs exponentially.
Although residual soil nitrate-N is not nitrate-N in groundwater, these findings clearly indicate the potential of water percolating through these well-drained soils between early October and June of the following year, leaching excess nitrate to the groundwater. Thus, any N application rates above the MRTN rate for corn (165 lb N/acre) would lead to elevated amounts of nitrate being leached, resulting in negative impacts on water quality. If the goal is to achieve maximum economic yields while protecting water quality, application rates of manure-N must not be above the MRTN!

In the 6-Yr Soil P Management Plan shown on pages 13 and 169 of the MMP, calculations show identical rates of 14,000 gal/acre of manure applied in Years 1, 2, and 3 of Scenario 1; 15,000 gal/acre of manure applied in Years 1, 2, and 3 in Scenario 2; and 15,000 gal/acre of manure applied in Years 5 and 6 in Scenario 3. Yet the table showing manure-N availability on pages 19 and 144 and on Table B states that 25% of the dairy manure-N applied carries over to the following year. Two questions: Why was the 25% carryover not considered in calculations shown on pages 13 and 139? (2) Why was the manure application rate for corn silage 1000 gal/acre greater than for corn? I’ve never seen that distinction in N or manure management publications? It is issues like this that cause me to wonder if the permit really is being applied for protecting water quality or is it simply to apply more manure on fewer acres, regardless of water quality impacts.

Even though this Daley Farms LLP proposal has many good features, the above concerns regarding rate of manure-N application must be addressed if the proposal has any chance to minimize nitrate-N and water quality concerns in groundwater in Winona Co.

**Comments on the seven Additional Manure Management Practices in the NPDES permit**

In my opinion, the additional practices in this list are creatively diverse, lack research evidence providing support, rather risky in terms of success, take additional time to facilitate their inclusion, and do not focus on practices that provide consistence year after year. Some will work and will provide benefits if weather and growing conditions are favorable. Research data from other practices suggest them to be inconsistent and therefore risky. Because of complicating and unintended effects, other practices could put the dairy expansion proposal at risk. Some are time consuming and may not make meaningful differences. Specific comments on each practice follows.

**Practice 1) Delaying manure applications in the fall until soil temperature are below 50 degrees.**

This practice is recommended and followed for fertilizer N (anhydrous ammonia and urea) on all but well-drained and excessively drained soils in south-central and western Minnesota. It works quite well for fertilizer because the conversion of fertilizer N to nitrate by soil bacteria occurs quite rapidly at soil temps above 50 degrees. At temps below 50 degrees F, nitrification by the bacteria occurs more slowly as temps decline to 32 degrees. However, dairy manure contains considerable amounts of organic N that is mineralized very slowly to nitrate and lesser amounts of ammonium that is nitrified more quickly to nitrate. Thus, the slower conversion of dairy manure in contrast to more rapid conversion of fertilizer N to nitrate does not provide the same outcome for manure as with fertilizer. Delaying fertilizer N application results in 100% of the fertilizer N being affected. Whereas, with dairy manure containing about 60% organic N and 40% ammonium N, only 40% is affected. However, this practice is directionally correct for manure but not as effective as with fertilizer. Will this late fall application of manure reduce nitrate losses from the manure system the following growing season is unknown. But, it is a researchable topic.
Determining soil temperatures as a guide for permitting fertilizer or manure application has been a challenge. Soil temperature at a 6” depth can vary substantially during the day from being high at 5:00 PM to lower the next morning at 5:00 AM, depending on the intensity of the sunlight in the 8-hour period before the PM reading. Soil temp can dip to below 50 degrees for a day or two in early October and then with continued warmer temps can rebound and remain above 50 degrees until late October. One can easily see how one farmer could then start applying manure in early October and his/her neighbor not until late October – the difference is entirely on how they want to interpret “below 50 degrees”. For these reasons, it is strongly recommended that soil temps be below 50 degrees for at least a few continuous days. When farmers assume the duty of reading their own thermometers, depth of installation can be an issue. Some tend to install them shallower and read them in the AM – an advantage for getting earlier application. To solve the soil temperature dilemma, it is wise to set a calendar date based on long-term soil temperature data. At Waseca, long-term 6” soil temp data indicate <50 degree soil temps usually occur at around Oct. 25. The fertilizer industry and consultants know this, and most usually start to apply ammonia a few days before the 25th. We are okay with that because it is at least three weeks later than they did in the 70’s and 80’s. I’d recommend a calendar date based on long-term data be established for this practice.

**Practice 2) Adding a nitrogen stabilizer (nitrification inhibitor) to manure when manure is applied.**

This practice has been available for fertilizer N since 1959 but was not used significantly until the 1990’s. New inhibitor products with “better chemistries” have been introduced in the last 20 years. In the last 5-10 years, most fall-applied anhydrous ammonia in south-central MN has been applied with inhibitors to limit the conversion of ammonia-N to nitrate-N until at least the next spring. Many research studies evaluating nitrification inhibitors for corn have been conducted in the last 40 years. When summarizing the results, they are very inconsistent!! Minnesota has had many positive results, especially with greater corn yields but with very little effect on reducing nitrate-N losses to tile drainage water. Illinois supports the use of inhibitors. Because of poor performance in their research studies, Iowa State does not even recommend them.

Nitrification inhibitor additions to hog manure have shown some corn yield responses. But, results from a limited amount of trials have been inconsistent. I have been told there are a couple of new inhibitors becoming available this year. Evaluations should take place over the next five years. At this time, I would not recommend the practice of adding a nitrification inhibitor/stabilizer to manure.

**Practice 3) Adding a N stabilizing additive to manure when fall-applied before soil temps are below 50.**

As far as timing goes, this practice makes some sense. Ammonium-N contained in manure applied in September and October is vulnerable to nitrification even though ammonium composes less than half of the total manure-N. Applying the manure + inhibitor before Sept 15 when the soils are still quite warm may pose a persistence problem for the inhibitors. The effectiveness of the older inhibitors declines over time and may not be effective after mid- to late October. Newer inhibitors may have a longer shelf life. The inhibitor may be especially effective if combined with a cover crop planted by Sept. 20. To my knowledge, there are no research data to support this combined approach, but it could be a 1 – 2 punch that could be quite effective. – Just a hunch. I would suggest this combination on a limited acreage and would ask or employ someone to take soil samples of the top 3’ in 1-ft increments in late October to see if this combined approach reduced soil nitrate-N concentrations compared to where manure without an inhibitor was added to the cover crop. Again, this is a risky practice in terms of both inhibitor performance and cover crop performance, and it needs to be researched.
Practice 4) Plant/seed a cover crop on field areas when manure is applied early in the fall before soil temps are below 50 degrees.

The first challenge with this practice is to have the previous crop removed so that either manure could be applied or a cover crop could be planted, preferably by Sept. 20. If a “bare” field is available, manure could then be applied and then the cover crop planted by Sept. 20. Or the cover crop could be planted and then the manure knife-injected immediately after planting. Depending on the tilth of the soil, some knife-injectors disturb only about a 6”-wide band, which would leave 6” bands or only 20% without an actively growing cover crop. I don’t think this would be a problem. If rainfall is adequate and air temperatures warm, the cover crop should become well established and reach 80% coverage. In my opinion, seeding a viable cover crop after Sept. 20 would be a risky practice with less potential for adequate growth, limiting uptake of nitrates from the mineralized manure, regardless of when the manure was applied. Again, this may be a cropping-manure system for the future after gaining further experience with weather variability, ideal cover crop species, and perhaps new nitrification inhibitors. At this time, I feel this is a rather risky practice to include in a permit because it is dependent on timing and other uncontrollable factors. But, it sure would be a good research project.

Practice 5) Apply manure in the spring.

If all weather, soil and crop production practices are ideal; this practice is the best of the 7 additional practices proposed. Conversion of spring-applied manure N to plant-available N would be timed close to and within the N uptake period of corn. Combined with an application rate of 165 lb N/acre, this combination has the potential of minimizing nitrate losses more than any other BMP management factors. However, some major operational drawbacks could be faced. First, to a farmer this means holding all manure over winter and delaying application at least 4-5 months with nothing done in the fall. That becomes a mental and psychological issue and does not fit well with most farmers’ goals. They have little other options other than to empty the lagoon in the spring when possibly faced with looming uncontrollable factors. If encountering a cold and wet spring with very wet soils, compaction could occur when applying manure, although using the drag-hose system would minimize soil compaction, especially on these well-drained soils. Planting would be delayed by spring application of manure and delayed further with wet weather. Yields could be reduced resulting in poorer N uptake efficiency, and greater potential for nitrate losses. With the highly productive, well-drained soils the Daley’s have and with good, coordinated management, spring application of manure coupled with the MRTN rate of 165 lb N/acre has the highest probability of economic and environmental success compared to the other management practices given even under slightly less than ideal weather conditions. If cold and wet weather prolonged throughout the spring, this practice would suffer greater challenges and be less effective than fall application practices.

Practice 6) Split-apply with no more than 90 lbs of predicted PAN being supplied by manure in the fall and the remaining nutrient needs being either manure or fertilizer applied in the spring.

In terms of reducing leaching losses of nitrate-N, this practice probably has good potential, especially if the fall-applied N contained a nitrification inhibitor, if the remaining N needs were met by a custom fertilizer applicator spring-applying urea or UAN fertilizer prior to the V6 stage of corn growth, and if there were fewer and larger fields without special protection areas. The Daley’s proposal has numerous obstacles that when combined serve as a nightmare. First, it would not be wise to split-apply manure. I have not heard or seen a farmer do that. Split applying fertilizer yes, manure no. Split-applying knife-injected manure is like conducting two successive primary tillage operations with lots of wheel traffic,
soil compaction, and time required. Second, it requires additional management in terms of the fertilizer dealer and applicator. Third, they project applying manure to about 40 fields – each one with special protection areas requiring certain application criteria. Many of the fields have uneven, curved edges, are not square or rectangular, and require attention to detail. In my opinion, this split-application practice across the proposed land application areas would be almost impossible. However, implementing this practice on a hundred acres of their best land would be novel, and I think quite successful. It is definitely a researchable practice related to scale of operation.

**Practice 7) Avoid application of manure on field areas that are shallow to bedrock or root restriction areas (<40").**

This is the most desirable of the seven practices in terms of headaches associated with land application of manure in this proposal. But, because shallow, yield-limiting soils occupy only a small area (about 1%) of all soils identified to receive manure, this practice will be of minor importance in terms of reducing the total amount of nitrates in groundwater for the project. However, the amount of nitrate-N in the leaching water from these small areas could be very high due to inadequate utilization of manure N by the water-restricted corn.

Furthermore, I suggest additional restrictions be added to the permit. Manure applications should not be allowed on the Sogn and Frankville soils because both are shallow with limited root depth. Also, the slopes range from 6% to 30% and are conducive to extreme soil erosion, which will deliver substantial amounts of phosphorus (P) from these high soil test P (STP) soils to surface water bodies. It is also very difficult to accurately apply manure on slopes of this magnitude. These areas should not be planted to row crops. I would further restrict manure applications to all soils with more than 10% slope. This proposal states that all soils receiving manure will receive chisel plow or heavy disk tillage. These full-width tillage systems loosen the soil and severely limit residue accumulation on the soil surface from the previous crop. The result is severe erosion of surface soils from these areas with deposition of high STP sediments in local streams flowing to the Mississippi River.

**Question #1a) What combination of BMPs, etc.?**

At the present time, I feel #6 coupled with an expanded #7 show the potential to be most helpful. In the future, I think planting a fall cover crop along with a nitrification inhibitor added to the fall-applied manure in #3 would be very helpful, but at this time experience is limited and could be risky in terms of overall performance.

**Question #1b) Can any BMPs meaning fully reduce the risk, etc.?**

Applying the proper agronomic rate of N is the most consistent BMP because it works each year and provides an additive effect over the years. If manure is applied at a rate exceeding the MRTN, nitrate-N levels in the soil profile will escalate because the N is being applied in excess of what the crop needs. In my professional opinion, applying dairy manure to a Port Byron or Mt. Carroll soil at a rate 10% below the MRTN would provide reduced nitrate-N carryover and leaching loss while providing excellent corn yields. In the future, more effective and versatile cover crops may be developed along with more highly effective and consistent nitrification inhibitors that will enhance the performance of fall-applied manure.
**Question #2) MDA banned fall application of nitrogen fertilizer in SE Minnesota,**

Fall N fertilizer has been banned because fertilizer N converts/nitrifies very quickly to nitrate in the fall and can be leached downward in these well-drained soils late in the fall and throughout the spring until corn uptake in June. Liquid dairy manure contains about 60% organic N which very slowly mineralizes to nitrate and does not produce significant nitrate until spring. The 40% ammonium pretty well nitrifies to nitrate if applied in September but much less so when applied in mid-October. Spring applications of manure can present major obstacles on some soils, especially under wet and cold conditions.

**Question#3a, 3b, and 3c)**

These questions have been answered in other portions of this review document.

**Question #3d) errors in application rate, etc.**

It isn’t so much error in the application rate; it is errors or insufficient information regarding the N content of the manure. I have a feeling that the N content will be lower than the “book” value of 31 lb N/1000 gal in this proposal. If the N content is less than 31, more manure will need to be applied per acre, which will reduce the total acreage required. For instance, if the 31 lb N/1000 gal manure requires 2000 acres of land for the Daley expansion, then reducing the N content of the manure to 20 lb N/1000 gal will require 33% more manure per acre or a 670-acre reduction resulting in 1330 acres needed. Thus, less land is required for a given amount of manure when manure contains less N.

**Question #4) Are the manure application sites reasonably capable of absorbing the volume, etc.?**

Yes, in terms of N I think they are, especially if the N concentration in the liquid manure to be applied is <20 lb N/1000 gal. Also, Karst features exist throughout Winona Co, and other SE Minnesota counties. They possess greater leaching concerns but not special application conditions per se. 92% of the soils in the MAS are excellent, highly productive soils.

**Question #5) Will a CAWT actually be able to comply, etc.?**

This is a complex undertaking and application will be difficult. An applicator with considerable experience, the latest modern equipment, and a strong desire to accomplish the task with perfection is essential. A CAWT who is knowledgeable, has experience and good equipment, but is willing to cut corners is not the right person for the project. One has to trust that the right CAWT or CAW company is hired. My recommendation is that MPCA or some other entity be instructed to randomly check on field compliance issues each application year. This official oversight would help stimulate compliance and provide confidence that all application requirements are being followed. Just having that statement in the permit indicates a serious nature and concern of compliance being followed.

**Question #6) Categorizing the MAS, etc.?**

Evaluation of MAS will occur later in this review report.
Question #7) Do you agree with the statement that the “status quo” of manure application is not working in this area and additional conditions are required, etc.?

YES!! As a professional soil scientist, who has a strong affinity for solid agronomic crop production coupled with environmental responsibility, I most certainly support the tailoring of manure application and crop production practices to develop environmentally sustainable systems for livestock producers in southeastern Minnesota. This is a unique agricultural area of the state in terms of its susceptibility to greater nitrate-N levels in the groundwater. It receives more precipitation than any other area of the state. The highly productive silt loam soils with good internal drainage show a high potential for leaching of nitrates to the groundwater. Groundwater storage is primarily found in rather shallow sandstone and limestone formations, with no layer of fine-textured soil restricting leaching from the silt loam surface soils to the groundwater storage areas. Water in the storage formations can move laterally into springs that contribute water to small streams. Many rural drinking water wells exist. Livestock producing significant manure N and corn requiring substantial fertilizer N dominate the agricultural area. The landscape consists of some rather level areas along the western side, a large area of moderately rolling soils with gentle to somewhat steep slopes in the central area, and a large area of steeply dissected soils dominated by forests along the eastern edge. Thus, with abundant precipitation and silt loam soils, soil erosion is also prevalent, especially with tilled row crops grown on steeper slopes. Under these conditions, additional guidelines and practices are required to limit contamination of groundwater by nitrate-N from livestock manure and fertilizer and contamination of surface water by nitrogen, phosphorus, and manure runoff. Environmental protection is not just a given in this part of the state, it needs the wide adoption of additional practices to help protect this landscape from long-term degradation.

Question #8) P soil tests from the MAS, etc.?

A review of the very high soil P tests will occur later in this review report.

Manure Application to the Manure Application Sites (MAS)

Application of >35 million gallons of liquid dairy manure to these 42 field sites (two fields were split) or 44 MAS sites will be a huge challenge because of the MAS soil properties. Soils shallow to bedrock (<40") occur at 27 of the MAS. Steeply sloping soils, ranging from 10% to 30% are found at many sites. These slopes are capable of causing severe erosion of these silt loam soils, leading to the deposition of considerable amounts of sediment, phosphorus, and manure in lower-lying water bodies. In addition, most of the sites were not uniform in size or shape and were chopped up, leading to additional time-consuming application challenges. Most sites included special protection areas and at least two of the following setbacks: Karst features, open tile intakes, wells, intermittent and perennial streams, and grass waterways.

In summary, after examining the projected manure application areas for each MAS and making a subjective analysis, I recommend that:

1) 9 MAS (sites 3, 4, 8, 20, 21, 22, 25, 27, and 28) be prohibited from receiving any manure application. These sites were considered to be unusually sensitive because shallow soils to bedrock (<40") occurred in all, many D slopes (>12"), and extensive setbacks with Karst features, intermittent streams, wells, and water ways, resulting in limited land areas for manure
application. These 9 sites appeared to be most environmentally vulnerable in terms of nitrate-N contamination of groundwater and sediment and P losses to surface water.

2) Manure application be prohibited from all soils with D or greater slopes (>12%). Potential erosion of sediment and P would be greatest and crop utilization of manure-applied N and P would be least on these soils.

3) Manure application be prohibited from all soils shallow to bedrock (<40”). That would include the Frankville 476D, Palsgrove D, and Sogn 11D soils. Manure utilization and crop yield would be restricted on these shallow, water-limiting soils, leading to elevated loss of nitrate-N to groundwater.

4) Consideration be given to not apply manure to any soil area with a slope of 10% or greater. In terms of sustainability, soil quality and water quality, manure application followed by full-width tillage is a high erosion-risk practice on these steeply sloping soils. Also, with climate change resulting in greater growing season precipitation and more intense, 24-hour rain events (>3” in 24 hours), we can expect more sizable erosion events than in the past. Also, manure application channels up and down the strong slopes tend to erode quickly under intense rainfall events until the corn crop canopy is well established.

I fully realize prohibiting manure application on some of these high-erosion potential soils will limit the number of acres needed to accommodate all of the manure produced, especially with respect to P. But, protection of soil and water resources in the delicate area of SE Minnesota is needed to sustain long-term productivity and nutrient-free water quality.

**Manure Applied to High Soil Test Phosphorus (STP) Fields**

A Bray soil test P (STP) of 21 ppm or more is considered to be very high (VH) in Minnesota. At these VH levels no fertilizer P is recommended! The STP values for the hundreds of samples shown in the EAW document range from 11 ppm to 282 ppm. Twenty four soil samples tested >100 ppm. Only two MAS tested less than VH—Lappiers and Orlies, both south of interstate I90. All others were > 25 ppm or very high. The three 2018 tests ranged from 93 to 136 ppm. These very high STP values may pose a challenge to meet the goals of the MMP. Moreover, these very high levels of STP are a significant environmental concern to surface waters if there is runoff or erosion from these sites.

High STP values have been an environmental concern for many years due to soil erosion, resulting in losses of sediment-bound P and very small losses of inorganic P to streams, lakes and other water bodies. The very high STP values of the soils in the MAS areas are a significant environmental concern to surface waters (local streams, Rush Creek, Whitewater River, Root River and the Mississippi River) if there is erosion or runoff from these fields. Although no specific STP value has served as a benchmark for elevated sediment-bound P losses, a rule-of-thumb value of 50 ppm or greater Bray P has often been associated with elevated and serious P losses. More recently, dissolved reactive inorganic P soluble in water has been found at high levels in tile flow and base flow to smaller streams in NW Ohio, and then the Maumee River draining into Lake Erie. Agricultural fertilizers, livestock manures, and human wastes applied to these poorly drained glacial till soils, have been the major sources, resulting in harmful algal blooms (HAB) in the Maumee River and Lake Erie. A HAB in 2014 was so severe that a municipal ban was placed on all water serving Toledo, OH (pop. 300,000) shutting down drinking water for three days.
because of toxins found in the water. The State of Ohio has been spending millions of dollars dealing with P losses to their surface waters for the last 10 years.

Iowa State University recently found elevated levels of inorganic P exceeding tolerance levels in tile water from agricultural fields. To my knowledge, this has not happened in Minnesota. The relationship between the STP levels and leaching movement in soil is not clear yet, but a value of 60 ppm P is generally thought to be a critical level based on studies in Great Britain. Substantial algal blooms in Lake Pepin in the summer, however, have been related to high P input from the Minnesota River. This is a major concern, especially among local residents. The Minnesota River downstream from Courtland, MN contains P levels well above those that are known to cause severe problems in lakes. These P problems, receiving much attention in the lower Minnesota River area, cause further problems downstream in Lake Pepin and the Mississippi River below Lake Pepin. At an average flow rate in the Minnesota River, 74% of the total P was contributed by nonpoint sources.

Similar to the Ohio, Iowa State, Minnesota River, Lake Pepin and Great Britain sites, a significant environmental P problem could occur on these high STP soils receiving manure in southeastern Minnesota. Movement of inorganic, reactive soluble P into the rather shallow groundwater aquifers, coupled with lateral groundwater movement to springs and small streams feeding into the Whitewater and Root Rivers and emptying into the Mississippi River could cause substantial environmental P issues at all levels. In my mind, these potential P problems demand significant research on the downward movement of P in these extremely high STP soils receiving abundant rates of manure where leaching of soluble nitrates customarily occurs.

One may question what the P issues occurring in Ohio, Great Britain, Iowa, Lake Pepin, and the Minnesota River, generally occurring on fine-textured, poorly drained, and glacial till soils have to do with liquid dairy manure applied to well-drained silt loam soils in Winona County. The extremely high STP values on many of the MAS that will continually receive copious amounts of manure presents a concern. If 35 million gallons of dairy manure are applied each year to the MAS and the manure contains 10 lb of P2O5/1000 gal, then a total of 35,000 lb of P2O5 will be applied each year to already very high STP soils. If downward movement of dissolved, reactive inorganic P moves through the soil profile and into the groundwater aquifer, a substantial environmental problem similar to Ohio could occur.

**Conclusion:** This large-scale, complex proposal, involving huge quantities of manure-N and manure P applied each year to well-drained silt loam soils having a variety of challenging soil properties and location setback requirements, will be a monumental challenge to accomplish without creating some significant environmental consequences. Management suggestions, involving rate and time of manure application, and optimizing manure utilization by choosing a suitable acreage of soils with favorable soil properties have been provided. Perhaps the scale of cows and manure may need to be amended some to meet the needs of both the Daley LLP and the soil and water quality environmental goals of southeastern Minnesota.
Exhibit 2
NEW NITROGEN GUIDELINES
For Corn Production in Minnesota

There’s been a major change in nitrogen guidelines for corn production in Minnesota. Nitrogen guidelines are no longer linked to yield goal. Instead, soil productivity, economics, and the grower’s attitude toward risk are major considerations.

The new nitrogen guidelines for corn/corn and corn/soybean rotations are listed in Table 1. These guidelines are appropriate for highly productive soils. The N Price/Crop Value column requires that the corn producer divide the cost of a pound of nitrogen by the dollar value of a bushel of corn. This ratio will vary for individual corn producers.

The “MRTN” column lists the rate of nitrogen to apply for various “Price/Crop Value” ratios. Choose the recommendations that correspond to the calculated ratio.

The “acceptable range” column lists a range of nitrogen rates that might be used for the various “Price/Crop Value” ratios. The lower rates are for producers who are conservative. The higher rates are for those who are aggressive.

Nitrogen guidelines for soils that have a medium productivity potential are listed in Table 2. In soils with a medium productivity potential, yields are limited by soil properties such as low water holding capacity (sandy soils), poor drainage, shallow topsoil, and gravel in the root zone.

Nitrogen credits for previous legume crops are listed in Table 3. To use these credits, start with the MRTN values listed for the corn/corn cropping sequence in Table 1. Then subtract the appropriate credit.

Use of manure presents a special situation. Use the 0.05 “Price/Crop Value” ratio. Then subtract the N credit for the rate of manure applied.

For situations where soil nitrate-nitrogen (NO₃-N) is measured to a depth of 24 inches, multiply lb. of NO₃-N at this depth by 0.6. Subtract this calculated value from the appropriate MRTN value in the corn/corn crop sequence.

<table>
<thead>
<tr>
<th>N Price/Crop Value Ratio</th>
<th>*MRTN</th>
<th>corn/corn acceptable range</th>
<th>MRTN</th>
<th>corn/soybeans acceptable range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05</td>
<td>155</td>
<td>130 to 180</td>
<td>120</td>
<td>100 to 140</td>
</tr>
<tr>
<td>0.10</td>
<td>140</td>
<td>120 to 165</td>
<td>110</td>
<td>90 to 125</td>
</tr>
<tr>
<td>0.15</td>
<td>130</td>
<td>110 to 150</td>
<td>100</td>
<td>80 to 115</td>
</tr>
<tr>
<td>0.20</td>
<td>120</td>
<td>100 to 140</td>
<td>85</td>
<td>70 to 100</td>
</tr>
</tbody>
</table>

* MRTN – Maximum Return To Nitrogen
Table 2. Guidelines for use of nitrogen fertilizer for corn grown on soils considered to have medium productivity potential.

<table>
<thead>
<tr>
<th>N Price/Crop Value Ratio</th>
<th>corn/corn</th>
<th>corn/soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>0.05</td>
<td>130</td>
<td>100</td>
</tr>
<tr>
<td>0.10</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>0.15</td>
<td>110</td>
<td>80</td>
</tr>
<tr>
<td>0.20</td>
<td>100</td>
<td>70</td>
</tr>
</tbody>
</table>

Table 3. Nitrogen credits for various legume crops that precede corn in the rotation.

<table>
<thead>
<tr>
<th>Previous Crop</th>
<th>1st year nitrogen credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb. N/acre</td>
</tr>
<tr>
<td>small grains*</td>
<td>40</td>
</tr>
<tr>
<td>harvested alfalfa (4+ plants/ft²)</td>
<td>150</td>
</tr>
<tr>
<td>(2-3 plants/ft²)</td>
<td>100</td>
</tr>
<tr>
<td>1 or less plants/ft²</td>
<td>40</td>
</tr>
<tr>
<td>edible beans</td>
<td>20</td>
</tr>
<tr>
<td>field peas</td>
<td>20</td>
</tr>
</tbody>
</table>

*Use this credit only if small grain stubble in southeastern Minnesota counties is tilled after harvest. Do not use if there was no tillage.

To arrive at a nitrogen guideline, use the following steps.

Step 1. Calculate the “N Price/Crop Value” ratio.
Step 2. Decide if soil is highly productive or has medium productivity potential.
Step 3. Select appropriate rate listed in MRTN column.
Step 4. Decide on rate to use within the acceptable range.
Exhibit 3
Manure nitrogen rates for corn production
Interpretation of University of Minnesota nitrogen guidelines

Minn. R. ch. 7020 (feedlot rules) limits the total amount of plant available nitrogen (N) applied to cropland when manure is utilized as a nutrient. In general, the feedlot rules require adherence to the University of Minnesota Extension Service recommendations. This document will outline how recent changes to the University nitrogen recommendations for corn production will be implemented within the framework of the feedlot rules.

This document does not address recommendations for corn production on irrigated sandy soils, which are discussed in the Minnesota Pollution Control Agency (MPCA) factsheet titled [Manure management for corn on irrigated sandy soils].

Choosing the appropriate nitrogen recommendation

The current University guidelines include multiple nitrogen recommendations that utilize ratios of the cost of fertilizer relative to the value of corn. For each ratio, the University guidelines provide a number termed the "maximum return to N value" (MRTN). N application rates that exceed the MRTN, increase the likelihood of N leaching/loss. Therefore, the MPCA expects N application rates to be consistent with the appropriate MRTN values. The maximum MRTN values are:

- 195 lbs N/acre for corn following corn
- 150 lbs N/acre for corn following soybeans

Farmers should also be aware some fields can achieve highly productive and profitable yields by applying N at rates below the maximum MRTN or by using best management practices (BMPs) for improved N utilization. Some items to consider to maximize N utilization include:

- **Soils and drainage.** Fields with low organic matter (3% or less) or poor drainage have less response to N.
- **Regional differences.** Yields in northern Minnesota might be lowered by a shorter growing season, while farms in southeast Minnesota with loess soils may be able to maximize yield with lower rates of N.
- **Application timing.** The time of year N is applied (ie. spring or fall) can influence N utilization.

The University of Minnesota has produced a number of documents that outline BMPs for improved N utilization, including some with a regional focus. Links to these BMP documents can be found on the Minnesota Department of Agriculture's [Nitrogen Fertilizer BMPs] webpage.

Recommendations for low productivity soils

For corn grown on non-irrigated loamy fine sands with less than 3% organic matter, the University recommends N application at 100 lbs N/acre for corn following corn or 70 lbs N/acre for corn following soybeans.

Rotations that include alfalfa

When alfalfa is grown one or two years prior to the current corn crop, the N recommendations include consideration of a number of factors when selecting the appropriate amount of N to apply. Given the complexity of the recommendations, the MPCA expects N rate decisions to comply with the recommendations as given but should not exceed the values in Table 1.

<table>
<thead>
<tr>
<th>Alfalfa age</th>
<th>First-year corn following alfalfa</th>
<th>Second-year corn following alfalfa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>80 lbs N/acre</td>
<td>120 lbs N/acre</td>
</tr>
<tr>
<td>2 years or more</td>
<td>40 lbs N/acre</td>
<td>80 lbs N/acre</td>
</tr>
</tbody>
</table>

Table 1. Maximum N application for first- and second-year corn following alfalfa
Accounting for all sources of nitrogen

In determining the proper rate, farmers must account for all sources of N including, but not limited to:

- Any commercial fertilizer or manure applications for the current crop
  - Including the use of starter fertilizer
- Previous crops can provide a source of N for the current corn crop. The credits in Table 2 below must be subtracted from the corn/corn MRTN to account for N contributions from previous crops.

Table 2. Nitrogen credits for different previous crops.

<table>
<thead>
<tr>
<th>Previous crop</th>
<th>N credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red clover*, alsike clover, birdsfoot trefoil, grass/legume hay, grass pasture, or fallow</td>
<td>75 lbs N/acre</td>
</tr>
<tr>
<td>Edible bean or field pea</td>
<td>20 lbs N/acre</td>
</tr>
</tbody>
</table>

*A credit of 35 lbs N/acre should also be given when red clover is grown two years before the corn crop

- Nitrates and/or N fertilizer in irrigation water
- N credits from manure application to the previous crop (2nd year manure credit)
  - 25% of N from manure applied for the previous crop is available to the current crop (15% for swine)

The total amount of N applied from all sources should be consistent with the MRTN.

Examples of N recommendation calculations

Example 1: 200 bu corn following edible bean crop:
- 180 lbs N/acre – 20 lbs N/acre (credit from table 2) = 160 lbs N/acre

Example 2: 200 bu corn following soybean crop with 5 gal of 10-34-0 starter applied at planting:
- 150 lbs N/acre – 6 lbs N/acre (N available in starter) = 144 lbs N/acre

Example 3: 210 bu corn following corn crop with 5 gal of 10-34-0 starter applied at planting:
- 180 lbs N/acre – 6 lbs N/acre (N available in starter) = 174 lbs N/acre
  - If swine manure was applied to the previous corn crop, a manure credit is also applicable:
    174 lbs N/acre - 35 lbs N/acre manure credit = 139 lbs N/acre

To learn more, consult the University of Minnesota calculating manure application rates webpage.

Deviations from the MRTN

The feedlot rule allows for deviations in excess of the MRTN in very limited situations. The allowable deviations are not intended for application of N at rates greater than the MRTN as a standard practice (ie. planned rate); however, the following are situations when a deviation may be warranted:

- N deficiencies are measured/observed during the growing season and N can be side-dressed.
- The results of a soil nitrate test suggests additional N is recommended.
- Recommendations from a land grant college in a contiguous state with similar soils and climatic conditions suggest a higher rate of N application.

Note: The supplemental N worksheet, referenced in the University publication, is not sufficient to justify additional N.

If you believe a deviation above the MRTN (up to 20%) is warranted, you need to document your justification for the additional N application as part of the required land application of manure records.

More information

For more information, consult the University of Minnesota “Fertilizing corn in Minnesota” resources at: extension.umn.edu/crop-specific-needs/fertilizing-corn-minnesota

For more information on manure application rates, see the University of Minnesota resources at: extension.umn.edu/manure-land-application/manure-application-rates

For additional nutrient planning resources, visit the MPCA feedlot program land application page at: www.pca.state.mn.us/water/land-application-manure
Exhibit 4
# Table of Contents

Understanding the Soil Test Report .............................................................. 5

Fertilizer Suggestions for:

- Alfalfa ........................................................................................................... 7
- Barley ............................................................................................................. 9
- Buckwheat ..................................................................................................... 12
- Canola .......................................................................................................... 13
- Corn ............................................................................................................. 14
- Dry Edible Bean .......................................................................................... 21
- Grasses for Hay and Pasture ....................................................................... 23
- Grass-Legume Mixtures ............................................................................. 24
- Kentucky Bluegrass, Timothy, Reed
  - Canary Grass Seed Production ................................................................. 25
- Millet ............................................................................................................ 26
- Oat ............................................................................................................... 27
- Red Clover, Alsike Clover, Birdsfoot Trefoil ............................................. 28
- Rye ............................................................................................................. 29
- Soybean ....................................................................................................... 30
- Sugar Beet ..................................................................................................... 32
- Sunflower ...................................................................................................... 33
- Wheat .......................................................................................................... 34
- Wildlife Food Plots ....................................................................................... 39
- Wild Rice ..................................................................................................... 40
UNDERSTANDING THE SOIL TEST REPORT

The concept of soil sampling and analysis of samples collected has been the basis of fertilizer recommendations used in crop production for many years. Regardless of the procedure used for the collection of the samples, the results of the laboratory analysis that reach the crop producer are frequently confusing. The units used to report the analytical results are not familiar. There are several numbers on the analysis sheet. There is a relationship between the analytical results and fertilizer and lime recommendations. Some explanation of the information which appears on the analytical report would probably be helpful.

The Reporting Units

The numbers found on any soil test report are the result of some analytical measurement of the nutrients in the soil. Most soil testing laboratories report this measurement as parts per million abbreviated as ppm. This reporting unit is used for nutrients other than nitrogen. Some laboratories report measurements in terms of pounds per acre. There is a simple conversion factor for these two reporting systems. That conversion is: ppm x 2 = lb. per acre.

When soil pH is measured, there are no units associated with the number that is reported. The same is true for the buffer pH.

When soil samples are analyzed for nitrate-nitrogen (NO₃-N), most laboratories will report the analytical results in two ways. The concentration is reported in terms of ppm. Then, depending on the depth from which the sample was collected, the concentration is converted into pounds of NO₃-N per acre for each increment of depth that was sampled. For example, if soil was collected from depths of 0 to 8 and 8 to 24 inches, the amount of NO₃-N at each depth is reported in terms of lb. per acre. The total for the 0 to 24 in. depth is calculated as the total that is found at 0 to 8 and 8 to 24 in. The sample calculations also apply to other depths that might be sampled.

There are a variety of reporting units for soil organic matter content. Some laboratories report the organic matter in relative terms for low, medium, and high. Others report the measured percentage.

The units chosen to report the analytical results do not have any effect on fertilizer guidelines. It is important, however, to be aware of the difference between ppm and lb. per acre when reading the units associated with the numbers on the soil test report.

The Procedures Used

There are several analytical procedures that can be used to extract plant nutrients from soils. The procedures used in testing soils are not designed to measure the total amount of any nutrient present in the soil. The analytical procedure used to measure a specific nutrient is selected because it extracts the portion of the total amount of that nutrient that is best related to plant growth. The selection of an analytical procedure is not arbitrary. The procedure selected has been developed from considerable research as the one which best predicts the amount of that nutrient in the soil that can be used by plants. The Bray and Kurtz #1 procedure (sometimes referred to as the weakBray procedure) used for measuring phosphorus in acid soils is a good example. Results of considerable research have shown that the amount of phosphorus extracted by this method is the best predictor of the need for phosphate fertilizer for acid soils. Bray and Kurtz also developed an analytical procedure that uses a stronger acid. However, the amount of phosphorus extracted by the stronger acid was not related to crop growth. Therefore, the use of this strong Bray or Bray P-2 procedure has no value for making phosphate fertilizer guidelines in Minnesota.

Analytical procedures used in soil testing are usually standardized. Currently, most soil testing laboratories that operate in the North-Central states use the same analytical procedure when analyzing for a specific nutrient. These laboratories also participate in a quality control program.
that produces confidence in the analytical results coming from that laboratory.

**Relative Levels**

The numbers listed on most soil test reports are usually followed by a letter such as VL, L, M, H, or VH. These letters are abbreviations for very low, low, medium, high, and very high, respectively. These letters designate the relative level of the nutrient measured and provide a good indication of the probability of measuring an economic increase in yield if fertilizer supplying the nutrient in question is applied. For example, if the relative level is classified as being very low, there is a high probability that crop yields will increase if fertilizer supplying the nutrient in question is applied. By contrast, no increase in yield from the application of the nutrient would be expected if the relative level in the soil is in the very high range. The relative proportion of nutrient needed from either soil or fertilizer at the various soil test levels is illustrated in the following figure.

The relative levels of the various immobile nutrients in soils have been defined in terms of concentration (ppm) measured by the appropriate extraction procedures. These definitions, used by the University of Minnesota, South Dakota State University, and North Dakota State University, are listed in the following table.

<table>
<thead>
<tr>
<th>Relative Level</th>
<th>Phosphorus</th>
<th>Potassium</th>
<th>Zinc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very low (VL)</td>
<td>0-5</td>
<td>0-3</td>
<td>0-0.25</td>
</tr>
<tr>
<td>Low (L)</td>
<td>6-11</td>
<td>4-7</td>
<td>0.26-0.50</td>
</tr>
<tr>
<td>Medium (M)</td>
<td>12-15</td>
<td>8-11</td>
<td>0.51-0.75</td>
</tr>
<tr>
<td>High (H)</td>
<td>16-20</td>
<td>12-15</td>
<td>0.76-1.00</td>
</tr>
<tr>
<td>Very high (VH)</td>
<td>21+</td>
<td>16+</td>
<td>1.01+</td>
</tr>
</tbody>
</table>

The range of values for each relative level shown in the above table is not used by all soil testing laboratories. A soil testing laboratory can use any range of values that it chooses. A difference in the range of values for each relative level is one source of confusion that adds to the difficulty of evaluating results from more than one soil testing laboratory. The ranges in the preceding table are the end result of a considerable amount of research conducted in the field.

It is important to understand that the number associated with any nutrient on a soil test report is an index value to be associated with one of the five relative levels. It is not the amount of a nutrient that is available for crop use. It is not the total amount of a nutrient present in the soil. The number listed is an index value only and when combined with an expected yield can be used to develop a fertilizer guideline.

**Understanding the Lime Guideline**

The soil test report also shows the pH of the soil sample and, if acid, provides a guideline for the amount of liming material to be used. When a soil sample is started through the analysis process, it is first mixed with water and stirred; then a pH reading is taken. This reading is the soil pH value. If this value is less than 6.0, the soil is mixed with a special buffer solution and another pH reading is taken. This second reading is known as the buffer pH. This buffer pH value is used to determine the rate of lime that is needed.
Interesting, But Not Useful

The reports from some soil testing laboratories list the Cation Exchange Capacity (CEC) of a soil. This is a fixed soil property that varies with soil texture and organic matter content. This soil property, however, is not useful for making fertilizer guidelines.

The laboratories that measure CEC also usually report values of exchangeable potassium (K), calcium (Ca), and magnesium (Mg). This is interesting information. But, this information is of little value for making fertilizer guidelines in Minnesota.

Don’t Be Confused

The soil test report contains a substantial amount of information. At first glance, this report can be confusing. Hopefully, the information presented in the previous paragraphs can help to eliminate some of the confusion.

ALFALFA

An assessment of the need for lime is usually the first consideration for alfalfa production. When soils are acid (pH less than 7.0), optimum alfalfa yields are usually associated with a soil pH in the range of 6.5 to 7.0. There are no management practices that are economic that will decrease soil pH values in excess of 7.4. When soil pH values are calcareous (7.4 and higher), the best strategy is to concentrate on appropriate management of fertilizer.

Two pH values may be printed on a soil test report form. Soil pH is determined by suspending soil in water and taking a reading. If the soil pH is less than 6.0, the sample is placed in a buffer solution and a reading is taken. This buffer pH value determines the rate of lime to apply.

Figure 1. Reference Map for lime guidelines.

Liming suggestions are listed in Tables 1 and 2. Figure 1 is used to determine location of Area I and Area II. Liming materials that are quarried in Minnesota are analyzed for Effective Neutralizing Power (ENP) and the results are reported as lb. ENP per ton of material.

Suggestions listed on the soil test report forms are given as lb. of ENP per acre. Rate of application (tons per acre) can be calculated from these two pieces of information. Analysis of byproduct liming materials is not required; it is voluntary. Additional information about lime use can be found in FS-5956, Lime Needs in Minnesota, and FS-05957, Liming Materials for Minnesota Soils.
Table 1. Lime guidelines for mineral soils when the soil pH is less than 6.0. The rates suggested should raise the pH to 6.5.

<table>
<thead>
<tr>
<th>SMP</th>
<th>Area 1</th>
<th>Area 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffer Index</td>
<td>ENP Ag Lime *</td>
<td>ENP Ag Lime *</td>
</tr>
<tr>
<td></td>
<td>lb./acre</td>
<td>ton/acre</td>
</tr>
<tr>
<td>6.8</td>
<td>3000</td>
<td>3.0</td>
</tr>
<tr>
<td>6.7</td>
<td>3500</td>
<td>3.5</td>
</tr>
<tr>
<td>6.6</td>
<td>4000</td>
<td>4.0</td>
</tr>
<tr>
<td>6.5</td>
<td>4500</td>
<td>4.5</td>
</tr>
<tr>
<td>6.4</td>
<td>5000</td>
<td>5.0</td>
</tr>
<tr>
<td>6.3</td>
<td>5500</td>
<td>5.5</td>
</tr>
<tr>
<td>6.2</td>
<td>6000</td>
<td>6.0</td>
</tr>
<tr>
<td>6.1</td>
<td>6500</td>
<td>6.5</td>
</tr>
<tr>
<td>6.0</td>
<td>7000</td>
<td>7.0</td>
</tr>
</tbody>
</table>

* These are approximate guidelines based on the average ENP value of ag lime. An ENP of 1,000 Lb. per ton is an average value for ag lime (crushed limestone) in Minnesota.

Table 2. Lime guidelines for mineral soils when the BUFFER TEST IS NOT USED (Soil pH is 6.0 or higher). The rates suggested should raise the pH to 6.5.

<table>
<thead>
<tr>
<th>Soil Water PH</th>
<th>Area 1</th>
<th>Area 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ENP Ag Lime *</td>
<td>ENP Ag Lime *</td>
</tr>
<tr>
<td></td>
<td>lb./acre</td>
<td>ton/acre</td>
</tr>
<tr>
<td>6.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.4</td>
<td>2000</td>
<td>2.0</td>
</tr>
<tr>
<td>6.3</td>
<td>2000</td>
<td>2.0</td>
</tr>
<tr>
<td>6.2</td>
<td>3000</td>
<td>3.0</td>
</tr>
<tr>
<td>6.1</td>
<td>3000</td>
<td>3.0</td>
</tr>
<tr>
<td>6.0</td>
<td>3000</td>
<td>3.0</td>
</tr>
</tbody>
</table>

* These are approximate guidelines based on the average ENP value of ag lime. An ENP of 1,000 Lb. per ton is an average value for ag lime (crushed limestone) in Minnesota.

**Nitrogen**

The use of nitrogen (N) is not suggested when alfalfa is seeded in medium or fine-textured soils because a reduction in nodulation might be observed. Small amounts of N fertilizer supplying about 25 lb. N per acre may enhance establishment when alfalfa is seeded in a coarse-textured soil. A small amount of N may be applied when alfalfa is seeded with a nurse or companion crop. This is especially true when soils are sandy. The suggested N rate for this nurse or companion crop situation is 30 lb. per acre.

**Phosphate and Potash**

Suggestions for the use of phosphate and potash are adjusted for expected yield and the soil test values for phosphorus (P) and potassium (K). The guidelines for phosphate and potash use are listed in Tables 3 and 4. These fertilizers can be top-dressed to established stands or broadcast and incorporated before planting. See FO-03814, Fertilizing Alfalfa in Minnesota for more detailed information about the management of phosphate and potash fertilizers.

Table 3. Phosphate fertilizer guidelines for alfalfa production in Minnesota.

<table>
<thead>
<tr>
<th>Phosphorus (P) Soil Test (ppm) *</th>
<th>Expected Yield</th>
<th>Bray:</th>
<th>Olsen:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-5</td>
<td>6-10</td>
<td>11-15</td>
</tr>
<tr>
<td>ton/acre</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>3 or less</td>
<td>45</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>55</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>95</td>
<td>65</td>
<td>40</td>
</tr>
<tr>
<td>7</td>
<td>110</td>
<td>80</td>
<td>45</td>
</tr>
<tr>
<td>more than 7</td>
<td>125</td>
<td>90</td>
<td>55</td>
</tr>
</tbody>
</table>

* These are approximate guidelines based on the average ENP value of ag lime. An ENP of 1,000 Lb. per ton is an average value for ag lime (crushed limestone) in Minnesota.

Use the following equations to calculate phosphate fertilizer guideline for specific expected yields and specific soil test values for P:

\[ P_{\text{2O}_5\text{rec}} = 18.57 - (0.93) (\text{Bray p}, \text{ppm}) \times (\text{Expected Yield}) \]

\[ P_{\text{2O}_5\text{rec}} = 18.57 - (1.16) (\text{Olsen P}, \text{ppm}) \times (\text{Expected Yield}) \]

Table 4. Potash fertilizer guidelines for alfalfa production in Minnesota.

<table>
<thead>
<tr>
<th>Potassium (K) Soil Test (ppm) *</th>
<th>Expected Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-40</td>
</tr>
<tr>
<td>t K,O to apply (lb./acre) ----</td>
<td>----</td>
</tr>
<tr>
<td>3 or less</td>
<td>145</td>
</tr>
<tr>
<td>4</td>
<td>190</td>
</tr>
<tr>
<td>5</td>
<td>240</td>
</tr>
<tr>
<td>6</td>
<td>290</td>
</tr>
<tr>
<td>7</td>
<td>335</td>
</tr>
<tr>
<td>more than 7</td>
<td>380</td>
</tr>
</tbody>
</table>

* Use the following equation to calculate potash fertilizer guideline for specific expected yields and specific soil test values for K:

\[ K_{\text{2O}_5\text{rec}} = 55.7 - (0.38) (K\text{ soil test}, \text{ppm}) \times (\text{Expected Yield}) \]
Other Nutrients

Sulfur (S) and boron (B) are two nutrients that might be needed in a fertilizer program for alfalfa. Use of sulfur will probably increase alfalfa production if soils are sandy. However, use of S on fine-textured soils will probably not increase alfalfa yield unless soil organic matter in the top 6-8 inches is 3.0% or less. The soil test for sulfur is not accurate for fine-textured soils and is not recommended. An annual application of 25 lb. S per acre is suggested for sandy soils while 15-25 lb. S per acre is suggested in fine textured soils when soil organic matter is 3.0% or less.

When needed, boron can be top dressed to established stands (Table 5). Because of the low rates of B needed, the B fertilizer should be blended with phosphate and/or potash fertilizers and broadcast for best results. Soils in Minnesota contain adequate amounts of copper (Cu), manganese (Mn), iron (Fe), and zinc (Zn) for optimum alfalfa production and those four micronutrients should not be needed in a fertilizer program.

<table>
<thead>
<tr>
<th>Soil Test for Boron</th>
<th>Boron Suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 1.0 ppm</td>
<td>2-4 lb./acre</td>
</tr>
<tr>
<td>1.1-5.0</td>
<td>0 lb./acre</td>
</tr>
<tr>
<td>more than 5.0</td>
<td>0 lb./acre</td>
</tr>
</tbody>
</table>

Table 5. Boron fertilizer suggestions for alfalfa in Minnesota.

BARLEY

Nitrogen

In Minnesota, barley is either grown for malting or as a feed grain. This intended use affects the guidelines for nitrogen (N) use. Barley can replace corn in a livestock ration. It is a good alternative for corn where soils are droughty and corn yields are frequently limited by moisture stress.

Nitrogen fertilizer guidelines can be based on the results of the soil NO₃-N test or the consideration of expected yield, previous crop, and soil organic matter content. The soil NO₃-N test is suggested for use in shaded areas of western Minnesota (see accompanying map).

Guidelines for fertilizer N are calculated as follows:

\[
N_{\text{rec}} = \begin{cases} 
(1.5) \cdot \text{EY} - \text{STN}_{(0-24 \text{ in.})} - N_{\text{pc}} & \text{Malting Barley} \\
(1.7) \cdot \text{EY} - \text{STN}_{(0-24 \text{ in.})} - N_{\text{pc}} & \text{Feed Grain Barley} 
\end{cases}
\]

Where:
- \(\text{EY}\) = expected yield (bu./acre)
- \(\text{STN}\) = nitrate-nitrogen (NO₃-N) measured to a depth of 24 in. (lb./acre)
- \(N_{\text{pc}}\) = amount of N supplied by the previous legume crop (lb./acre)

These N credits are summarized in Table 6.
Table 6. Nitrogen credits for various legume crops that might precede barley in a crop rotation. Use these credits for the “Npc” factor in situations where the soil nitrate test is used.

<table>
<thead>
<tr>
<th>Previous Crop</th>
<th>1st Year Nitrogen Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybean</td>
<td>20</td>
</tr>
<tr>
<td>Edible beans, field peas</td>
<td>10</td>
</tr>
<tr>
<td>Harvested sweetclover</td>
<td>10</td>
</tr>
<tr>
<td>Harvested alfalfa*</td>
<td>35</td>
</tr>
<tr>
<td>4 to 6 plants/ft²</td>
<td>75</td>
</tr>
<tr>
<td>2 to 3 plants/ft²</td>
<td>50</td>
</tr>
<tr>
<td>1 or fewer plants/ft²</td>
<td>0</td>
</tr>
</tbody>
</table>
* Add 20 lb. N/acre to the credits listed if the 3rd or 4th cutting was not harvested.

Use Table 7 if the soil NO₃-N test is not used.

The suggestions in this table are based on a realistic expected yield, previous crop, and soil organic matter content. When using guidelines in this table, there is no distinction between malting barley and feed barley.

The N supplied by legume crops in a rotation with barley can be utilized by barley grown for the first and second year after the legume.

The nitrogen credits for a legume crop grown two years preceding the barley are listed in Table 8. These credits are suggested when the soil NO₃-N test is not used. Subtract these credits from the N recommendations listed for the crop sequence when barley is grown after crops in Group 2.

Crops in Group 1:
Alsike clover, birdsfoot trefoil, grass/legume hay, grass legume pasture, fallow, red clover.

Crops in Group 2:
Barley, buckwheat, canola, corn, grass hay, grass pasture, oat, potato, rye, sorghum-sudan, sugar beet, sunflower, sweet corn, triticale, wheat.

Table 7. Nitrogen guidelines for barley for situations when the soil nitrate test is not used.

<table>
<thead>
<tr>
<th>Crop Grown Last Year</th>
<th>Organic Matter Level*</th>
<th>50 or less</th>
<th>60-69</th>
<th>70-79</th>
<th>80-89</th>
<th>90-99</th>
<th>100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa (4+ plants/ft²)</td>
<td>Low</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>25</td>
<td>40</td>
<td>55</td>
</tr>
<tr>
<td>Med and high</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td>Alfalfa (2-3 plants/ft²)</td>
<td>Low</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>Med and high</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>25</td>
<td>40</td>
<td>55</td>
<td>70</td>
</tr>
<tr>
<td>Soybeans</td>
<td>30</td>
<td>50</td>
<td>65</td>
<td>80</td>
<td>95</td>
<td>110</td>
<td>125</td>
</tr>
<tr>
<td>Med and high</td>
<td>0</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
</tr>
<tr>
<td>Alfalfa (1 or less plants/ft²)</td>
<td>Low</td>
<td>40</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
</tr>
<tr>
<td>Med and high</td>
<td>0</td>
<td>40</td>
<td>55</td>
<td>70</td>
<td>85</td>
<td>100</td>
<td>115</td>
</tr>
<tr>
<td>Edible beans, field peas,</td>
<td>Low</td>
<td>0</td>
<td>20</td>
<td>35</td>
<td>50</td>
<td>65</td>
<td>80</td>
</tr>
<tr>
<td>Med and high</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td>Group 1 Crops</td>
<td>50</td>
<td>70</td>
<td>85</td>
<td>100</td>
<td>115</td>
<td>130</td>
<td>145</td>
</tr>
<tr>
<td>Med and high</td>
<td>30</td>
<td>50</td>
<td>65</td>
<td>80</td>
<td>95</td>
<td>110</td>
<td>125</td>
</tr>
<tr>
<td>Organic Soils</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* low = less than 3.0%; medium and high = 3.0% or more

Phosphate and Potash

Guidelines for phosphate and potash fertilizer use are listed in Tables 9 and 10, respectively. For more details on the application of these fertilizers, see FO-03773, Fertilizing Barley in Minnesota. In general, lower rates of phosphate and potash can be used if placed in a band near the
seed. Compared to a broadcast application, rates can be reduced by 1/2 if a banded application is used.

Other Nutrients

The use of sulfur (S) and copper (Cu) may be important for optimum barley production in limited situations. If barley is grown on sandy soils, either broadcast 25 lb. S/acre or use 10-12 lb. S/acre with the drill at planting. Sulfur will not be needed for barley grown on fine-textured soils.

The Cu suggestions are summarized in Table 11. Copper will not be needed in a fertilizer program when barley is grown on mineral soils. In Minnesota, barley has not responded to the use of zinc (Zn), iron (Fe), manganese (Mn) and boron (B) in a fertilizer program.

### Table 9. Phosphate fertilizer Guidelines for barley production.

<table>
<thead>
<tr>
<th>Expected Yield</th>
<th>Bray: 0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>-</td>
</tr>
<tr>
<td>Bdcst</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>-</td>
</tr>
<tr>
<td>pot./acre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>less than 50</td>
<td>20</td>
<td>35</td>
<td>15</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>50-69</td>
<td>20</td>
<td>40</td>
<td>15</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>60-69</td>
<td>25</td>
<td>45</td>
<td>15</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>70-79</td>
<td>25</td>
<td>50</td>
<td>20</td>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>80-89</td>
<td>30</td>
<td>60</td>
<td>20</td>
<td>40</td>
<td>15</td>
</tr>
<tr>
<td>90-99</td>
<td>35</td>
<td>65</td>
<td>25</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td>100+</td>
<td>35</td>
<td>70</td>
<td>25</td>
<td>50</td>
<td>20</td>
</tr>
</tbody>
</table>

* Use one of the following equations if a phosphate guideline for a specific expected yield and a specific P soil test is desired.

\[
P_{2}O_{5 \text{rec}} = (0.785 - (0.039 \times \text{Bray P, ppm}) \times \text{Expected Yield})
\]

\[
P_{2}O_{5 \text{rec}} = (0.785 - (0.050 \times \text{Olsen P, ppm}) \times \text{Expected Yield})
\]

### Table 10. Potash fertilizer guidelines for barley production.

<table>
<thead>
<tr>
<th>Expected Yield</th>
<th>Potassium (K) Soil Test, ppm*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-40</td>
</tr>
<tr>
<td>Drill</td>
<td>- - - K_{2}O to apply (lb./acre) - - -</td>
</tr>
<tr>
<td>Bdcst</td>
<td>- - -</td>
</tr>
<tr>
<td>pot./acre</td>
<td></td>
</tr>
<tr>
<td>less than 50</td>
<td>25</td>
</tr>
<tr>
<td>50-69</td>
<td>30</td>
</tr>
<tr>
<td>60-69</td>
<td>35</td>
</tr>
<tr>
<td>70-79</td>
<td>40</td>
</tr>
<tr>
<td>80-89</td>
<td>50</td>
</tr>
<tr>
<td>90-99</td>
<td>55</td>
</tr>
<tr>
<td>100+</td>
<td>55</td>
</tr>
</tbody>
</table>

* Use the following equation for a potash guideline for a specific expected yield.

\[
K_{2}O_{\text{rec}} = (1.286 - (0.0085 \times \text{K Soil Test}) \times \text{Expected Yield})
\]

*Suggestions for marginal soil tests are based on limited trial data.
BUCKWHEAT

Nitrogen

Nitrogen (N) fertilization is an important management practice for optimum production of buckwheat. Nitrogen fertilizer guidelines can be based either on the results of the soil NO$_3$--N test or the consideration of the combination of expected yield, previous crop, and soil organic matter content. The soil NO$_3$-N test is appropriate for western Minnesota (see Figure 2). When the soil NO$_3$-N test is used, the fertilizer N guidelines are calculated as follows:

\[ N_{\text{rec}} = (0.0458) \cdot (EY) - \text{STN}_{(0-24 \text{ in.})} - N_{pc} \]

Where:
- \( EY \) = expected yield (lb./acre)
- \( \text{STN} \) = nitrate-nitrogen (NO$_3$-N) measured to a depth of 24 in. (lb./acre)
- \( N_{pc} \) = amount of N supplied by the previous legume crop (lb./acre).

These N credits are summarized in Table 6.

The N fertilizer guidelines for production situations where the soil NO$_3$-N test is not used are listed in Table 12.

For most production situations, the N fertilizers should be broadcast and incorporated before planting. The N fertilizer can be applied in either dry or liquid form. There is no research to document that one form is superior to the other.

<table>
<thead>
<tr>
<th>Crop Grown Last Year</th>
<th>Organic Matter Level*</th>
<th>Expected Yield (lb./acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1200-1450</td>
</tr>
<tr>
<td>Alfalfa (4+ plants/ft$^2$)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Soybeans</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td>Alfalfa (1 or less plants/ft$^2$)</td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Edible beans, field peas,</td>
<td>Low</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Group 1 Crops</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Group 2 Crops</td>
<td>Low</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>20</td>
</tr>
</tbody>
</table>

* low = less than 3.0%; medium and high = 3.0% or more

Table 13. Phosphate fertilizer guidelines for buckwheat production.

<table>
<thead>
<tr>
<th>Expected Bray:</th>
<th>0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Olsen:</td>
<td>0-3</td>
<td>4-7</td>
<td>8-11</td>
<td>12-15</td>
<td>16 +</td>
</tr>
<tr>
<td>lb/acre</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- Use one of the following equations if a phosphate guideline for a specific soil test and a specific expected yield is desired.

\[ P_{2}O_{5,\text{rec}} = [0.0275 - (0.0014) \cdot (\text{Bray P, ppm})] \cdot (\text{Expected Yield}) \]
\[ P_{2}O_{5,\text{rec}} = [0.0275 - (0.0017) \cdot (\text{Olsen P, ppm})] \cdot (\text{Expected Yield}) \]
Therefore, all sources of N are equal if properly applied.

Crops in Group 1:
Alsike clover, birdsfoot trefoil, grass/legume hay, grass legume pasture, fallow, red clover.

Crops in Group 2:
Barley, buckwheat, canola, corn, grass hay, grass pasture, oat, potato, rye, sorghum-sudan, sugar beet, sunflower, sweet corn, triticale, wheat.

**Phosphate and Potash**

The guidelines for the use of phosphate and potash are summarized in Tables 13 and 14.

These fertilizers, when needed, should be broadcast and incorporated before planting. Special sources of phosphate and potash are not needed for buckwheat production. All commonly sold sources for each nutrient are equal.

There is no research which suggests that nutrients other than N, P, and K are needed in a fertilizer program for buckwheat production in Minnesota. CAUTION! Do not apply any fertilizer in contact with buckwheat seed at planting.

Table 14. Potash fertilizer guidelines for buckwheat production.

<table>
<thead>
<tr>
<th>Expected Yield</th>
<th>Potassium (K) Soil Test, ppm *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-40</td>
</tr>
<tr>
<td>lb/acre</td>
<td>K2O to apply (lb./acre)</td>
</tr>
<tr>
<td>1200-1450</td>
<td>45</td>
</tr>
<tr>
<td>1451-1700</td>
<td>55</td>
</tr>
<tr>
<td>1701-1950</td>
<td>60</td>
</tr>
<tr>
<td>1951-2200</td>
<td>70</td>
</tr>
</tbody>
</table>

* Use the following equation if a potash guideline for a specific expected yield.

\[
K_2O_{rec} = [0.0358 - (0.023) \times \text{Soil Test K, ppm}] \times \text{Expected Yield}
\]

**CANOLA**

In recent years, the canola crop has become an important part of the crop rotations in northern Minnesota. Yields have increased as improved management practices are adopted by growers. Improved fertilizer management is one major contributor to improved yields. The guidelines for improved canola production are described in the sections that follow.

**Nitrogen**

Nitrogen (N) fertilizer guidelines can be based either on the results of the soil NO3-N test or the consideration of expected yield, previous crop, and soil organic matter content. The soil NO3-N test is appropriate for western Minnesota (see Figure 2). When the soil NO3-N test is used, the N guidelines can be derived from the following equation:

\[
N_{rec} = (6.5) \times \text{EY} - \text{STN}_{(0-24 \text{ in.})} - N_{pc}
\]

Where:

- \( \text{EY} \) = expected yield (cwt./acre)
- \( \text{STN} \) = nitrate-nitrogen (NO3-N) measured to a depth of 24 in. (lb./acre)
- \( N_{pc} \) = amount of N supplied by the previous legume crop (lb./acre)

These N credits are summarized in Table 6.

The fertilizer guidelines for situations where the soil test is not used are listed in Table 15.

Crops in Group 1:
Alsike clover, birdsfoot trefoil, grass/legume hay, grass legume pasture, fallow, red clover.

Crops in Group 2:
Barley, buckwheat, canola, corn, grass hay, grass pasture, oat, potato, rye, sorghum-sudan, sugar beet, sunflower, sweet corn, triticale, wheat.

**Phosphate and Potash**

The guidelines for the use of phosphate fertilizer are summarized in Table 16. The suggestions for
potash use are in Table 17. The listed rates are suggested for a broadcast application.

**Table 16. Phosphate fertilizer guidelines for canola production.**

<table>
<thead>
<tr>
<th>Phosphorus (P) Soil Test, ppm</th>
<th>Expected Bray: 0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>Olsen: 0-3</td>
<td>4-7</td>
<td>8-11</td>
<td>12-15</td>
<td>16+</td>
</tr>
<tr>
<td>cwt/acre</td>
<td>P2O5 to apply (lb./acre)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-15</td>
<td>40</td>
<td>25</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16-20</td>
<td>55</td>
<td>40</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21-25</td>
<td>75</td>
<td>50</td>
<td>30</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>25+</td>
<td>80</td>
<td>55</td>
<td>35</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

*Use one of the following equations if a phosphate guideline for a specific soil test and a specific expected yield is desired.

\[ P_{2O_5}^{\text{rec}} = [3.60 - (0.17) \text{ (Bray P, ppm)}] \times \text{ (Expected Yield)} \]

\[ P_{2O_5}^{\text{rec}} = [3.60 - (0.22) \text{ (Olsen P, ppm)}] \times \text{ (Expected Yield)} \]

**Table 17. Potash fertilizer guideline for canola production.**

<table>
<thead>
<tr>
<th>Expected Yield (cwt./acre)</th>
<th>Potassium (K) Soil Test, ppm</th>
<th>Organic Matter Level*</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-15</td>
<td>0-40</td>
<td>Low</td>
</tr>
<tr>
<td>16-20</td>
<td>40-80</td>
<td>Med and high</td>
</tr>
<tr>
<td>21-25</td>
<td>80-120</td>
<td>Med and high</td>
</tr>
<tr>
<td>25+</td>
<td>120-160</td>
<td>Med and high</td>
</tr>
<tr>
<td>160+</td>
<td>160+</td>
<td>Med and high</td>
</tr>
</tbody>
</table>

* low = less than 3.0%; medium and high = 3.0% or more

**Sulfur**

The canola crop is very responsive to sulfur fertilization. When this crop is grown on heavy textured soils, a rate of 10 to 15 lb. of sulfur per acre is suggested. The suggested rate increases to 20 to 30 lb. of sulfur per acre when this crop is grown on sandy soils. Broadcast applications are appropriate for this crop.

**Other Nutrients**

There is no research data to suggest that other nutrients are needed in a fertilizer program for canola production. Therefore, none are recommended. CAUTION! Do not apply fertilizer in contact with the seed at planting.

**Corn**

In Minnesota, corn is grown on more acres than any other crop. Nationally, Minnesota ranks among the top five in production. Average corn yields have improved steadily over the past several decades. While general fertilizer use contributed substantially to yield increases in the past, total fertilizer management which optimizes nutrient efficiency will be needed to increase future production and profitability.
Nitrogen

There are many management decisions involved in the use of N fertilizers. The most important, however, is the selection of a N rate that will produce maximum profit while limiting the potential for environmental degradation. The choice of an appropriate rate of fertilizer N is not easy because of the transient nature of N in soils.

With the volatility in energy costs, fertilizer N cost has risen dramatically. This increase does affect the economic optimum N rate. To account for this change, the ratio of the price of N per lb. to the value of a bushel of corn has been added to the N rate decision. An example calculation of the price/value ratio is if N fertilizer costs $0.30 per lb N or $492 per ton of anhydrous ammonia, and corn is valued at $2.00 per bushel, the ratio would be 0.30/2.00 = 0.15.

Once the soil productivity and price/value ratio have been determined, a producer’s attitude towards risk must be factored into the process. A producer, who is risk adverse and cannot tolerate risk associated with less-than-maximum yields in some years even though economic return to N may not always be the greatest, may want to use the N rates near the high end of the acceptable range shown in Table 18. On the other hand, if water quality concerns are an issue and/or localized N response data support lower N rates, producers may choose N rates near the low end of the acceptable range in Table 18 if they are willing to accept the possibility of less-than-maximum yield in some years without sacrificing profit. This acceptable range gives each producer flexibility in arriving at an acceptable and profitable N rate. The maximum return to N value (MRTN) shown in Table 18 is the N rate that maximizes profit to the producer based on the large number of experiments supporting these guidelines.

The N rate guidelines in Table 18 are used if corn is grown in rotation with soybean or following corn under high productivity conditions and guidelines in Table 19 are used under medium productivity conditions. Corn grown on sandy soils deserves special consideration. If irrigated, the guidelines listed in Table 18 are appropriate. For non-irrigated corn grown on sandy soils (loamy fine sands, sandy loams, loams) with more than 3% organic matter, use the guidelines given in Table 19. For non-irrigated corn grown on soils with a loamy fine sand texture and less than 3% organic matter, use the guidelines provided in Table 20.

To arrive at a guideline following other crops, an adjustment (credit) is made to the corn following corn guidelines. The adjustments can be found in Table 21. In Table 21, several crops are divided into Group 1 and Group 2.

Table 18. Guidelines for use of nitrogen fertilizer for corn grown on soils considered to be highly productive.

<table>
<thead>
<tr>
<th>N Price/Crop Value Ratio</th>
<th>Corn/Corn</th>
<th>Corn/Soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MRTN</td>
<td>Acceptable Range</td>
</tr>
<tr>
<td>0.05</td>
<td>155</td>
<td>130 to 180</td>
</tr>
<tr>
<td>0.10</td>
<td>140</td>
<td>120 to 165</td>
</tr>
<tr>
<td>0.15</td>
<td>130</td>
<td>110 to 150</td>
</tr>
<tr>
<td>0.20</td>
<td>120</td>
<td>100 to 140</td>
</tr>
</tbody>
</table>

MRTN = maximum return to nitrogen

Table 19. Guidelines for use of nitrogen fertilizer for corn grown on soils considered to have medium productivity potential.

<table>
<thead>
<tr>
<th>N Price/Crop Value Ratio</th>
<th>Corn/Corn</th>
<th>Corn/Soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.05</td>
<td>130</td>
<td>100</td>
</tr>
<tr>
<td>0.10</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>0.15</td>
<td>110</td>
<td>80</td>
</tr>
<tr>
<td>0.25</td>
<td>100</td>
<td>70</td>
</tr>
</tbody>
</table>
Table 20. Suggested nitrogen guidelines for corn grown on non-irrigated loamy fine sands with less than 3 % organic matter.

<table>
<thead>
<tr>
<th>N Price/Crop Value Ratio</th>
<th>Corn/Corn</th>
<th>Corn/Soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>0.10</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>0.15</td>
<td>90</td>
<td>60</td>
</tr>
<tr>
<td>0.25</td>
<td>80</td>
<td>50</td>
</tr>
</tbody>
</table>

It’s generally accepted that legume crops provide N to the next crop in the rotation. Some forage legumes provide some N in the second year after the legume was grown. These second year N credits are listed in Table 22. If corn is grown in the second year following alfalfa and red clover, these N credits should be subtracted from the N rates that would be used when corn follows the crops listed in Group 2.

Table 21. Nitrogen credits for different previous crops for the first year of corn.

<table>
<thead>
<tr>
<th>Previous Crop</th>
<th>1st Year Nitrogen Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Grains*</td>
<td>40</td>
</tr>
<tr>
<td>Harvested alfalfa:</td>
<td></td>
</tr>
<tr>
<td>4 or more plants/ft²</td>
<td>150</td>
</tr>
<tr>
<td>2 to 3 plants/ft²</td>
<td>100</td>
</tr>
<tr>
<td>1 or fewer plants/ft²</td>
<td>40</td>
</tr>
<tr>
<td>Group 1 Crops</td>
<td>75</td>
</tr>
<tr>
<td>Group 2 Crops</td>
<td>0</td>
</tr>
<tr>
<td>Edible beans</td>
<td>20</td>
</tr>
<tr>
<td>Field peas</td>
<td>20</td>
</tr>
</tbody>
</table>

*Use this credit if any small grain stubble in southeastern Minnesota counties was tilled after harvest; if there was no tillage, use guidelines for crops in group 2. Use guidelines for crops in group 2 if corn follows small grain in the remainder of the state.

Crops in Group 1:
Alsike clover, birdsfoot trefoil, grass/legume hay, grass legume pasture, fallow, red clover.
Crops in Group 2:
Barley, buckwheat, canola, corn, grass hay, grass pasture, oat, potato, rye, sorghum-sudan, sugar beet, sunflower, sweet corn, triticale, wheat.

Table 22. Nitrogen credits for some forage legumes if corn is planted two years after the legume.

<table>
<thead>
<tr>
<th>Legume Crop</th>
<th>2nd Year Nitrogen Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvested alfalfa</td>
<td>lb. N/acre</td>
</tr>
<tr>
<td>4 or more plants/ft²</td>
<td>75</td>
</tr>
<tr>
<td>2 to 3 plants/ft²</td>
<td>50</td>
</tr>
<tr>
<td>1 or fewer plants/ft²</td>
<td>0</td>
</tr>
<tr>
<td>Red clover</td>
<td>35</td>
</tr>
</tbody>
</table>

Use of the Soil NO₃-N test encouraged.

Western Minnesota

The use of the soil NO₃-N test is a key management tool for corn producers in western Minnesota. The use of this test is appropriate for the shaded counties shown in Figure 2. The NO₃-N soil test is particularly useful for conditions where elevated residual nitrate-N is suspected. Figure 3 is a decision tree that indicates situations where the nitrate-N soil test would be especially useful.

For this test, soil should be collected from a depth of 6-24 inches in addition to the 0-6 inch sample. The corn grower in western Minnesota also has the option of collecting soil from 0-24 inches and analyzing the sample for NO₃-N.

When using the soil NO₃-N test, the amount of fertilizer N required is determined from the following equation:

\[ NG = (\text{Table 18 value for corn/corn}) - (0.60 \times \text{STN(0-24 in.)}) \]

\[ NG = \text{Amount of fertilizer N needed, lb./acre} \]

Table 18 value = the amount of fertilizer needed, adjusted for soil potential, value ratio, and risk.

STN(0-24) = Amount of NO₃-N measured by using the soil NO₃-N test, lb./acre.

South-central, southeastern, east-central Minnesota

Research has led to the inclusion of a soil NO₃-N test to adjust fertilizer N guidelines in south-central, southeastern, and east-central Minnesota (non-shaded areas of Figure 2). This test, in which soil NO₃-N is measured in the spring before planting from a two-foot sampling depth, is an option that can be used to estimate residual N. In implementing this test, the user should first evaluate whether conditions exist for residual N to accumulate. Factors such as previous crop, soil texture, manure history, and preceding rainfall can have a significant effect on accumulation of residual N.

A crop rotation that has corn following corn generally provides the greatest potential for significant residual N accumulation. In contrast, when soybean is the previous crop, much less residual N has been measured. This test should not be used following alfalfa.

The soil N test works best on medium- and fine-textured soils derived from loess or glacial till. The use of the soil NO₃-N test on coarse-textured soils derived from glacial outwash is generally not worthwhile because these soils consistently have low amounts of residual NO₃-N.

The amount of residual NO₃-N in the soil is also dependent on the rainfall received the previous year. In a year following a widespread drought, 1989 for example, a majority of fields will have significant residual NO₃-N. However, following relatively wet years, such as the early 1990s, little residual NO₃-N can be expected.

This soil NO₃-N testing option, which estimates residual NO₃-N, will not be appropriate for all conditions. Figure 3 can be used to help decide which fields may need to be sampled. This flowchart uses such factors as previous crop, manure history, and knowledge of previous rainfall.
Nitrogen fertilizer guidelines for corn can be made with or without the soil NO\textsubscript{3}--N test. The University of Minnesota’s N guidelines (Table 18) are still the starting point. A five-step process is suggested when the soil NO\textsubscript{3}--N test is considered.

1. Determine N rate guideline using Table 18 using soil productivity, price/value ratio, and previous crop for the specific field. The prescribed rate assumes that best management practices will be followed for the specific conditions.

2. Determine whether conditions are such that residual nitrate-nitrogen may be appreciable. Figure 2, which includes factors such as previous crop, manure history, and previous fall rainfall can provide insight as to the applicability of testing for nitrate-nitrogen. If conditions are such that the probability of residual NO\textsubscript{3}--N is small and soil testing for NO\textsubscript{3}--N is not recommended, use the N guideline derived in Step 1.

3. If conditions suggest that a soil NO\textsubscript{3}--N test is warranted, collect a preplant, 0-2 ft. soil sample taking enough soil cores from a field so that the sample is representative of the entire field. The sample should be sent to a laboratory and analyzed for NO\textsubscript{3}--N.

4. Determine residual N credit based on the measured soil NO\textsubscript{3}--N concentrations. Use Table 23 to determine this credit.

5. Calculate the final N rate by subtracting the residual N credit (Step 4) from the previously determined N guideline (Step 1). The resulting fertilizer N rate can then be applied either preplant and/or as a sidedress application.

Best Management Practices for Nitrogen

Because of the diversity of soils, climate, and crops in Minnesota, there are no uniform statewide guidelines for selection of a source of fertilizer N, placement of the N fertilizer, and use of a nitrification inhibitor. In order to accurately address this diversity, Minnesota has been divided into five regions and best management practices (BMPs) for N use in each region have been identified and described. The listing of these management practices for all regions is not appropriate for this publication.

Currently, the use of these best management practices is voluntary. Corn growers should implement BMPs to optimize N use efficiency, profit, and protect against increased losses of NO\textsubscript{3}--N to groundwater aquifers and surface waters. Time of application, selection of a N source, placement of fertilizer N, and decisions regarding the use of a nitrification inhibitor are topics that are discussed in detail in other Extension publications listed at the end of this folder.

Phosphate and Potash Suggestions

When needed, the use of phosphate and/or potash fertilizer can produce profitable increases in corn yields. The suggestions for phosphate fertilizer use are summarized in Table 24. The
Rate Changes with Placement

The phosphate suggestions provided in Table 24 change with soil test level for phosphorus (P), expected yield, and placement. In general, the results of the Olsen test should be used if the soil pH is 7.4 or higher. There are some situations where the results of the Bray test are higher than the results of the Olsen test when soil pH values are higher than 7.4. For these cases, the amount of phosphate recommended should be based on the soil test value that is the higher of the two.

Measurement of P by the Mehlich III procedure is not recommended in Minnesota. However, some soil testing laboratories analyze P with this analytical test. For these situations, use the recommendations appropriate for the results of the Bray procedure. The definition of categories is the same for both the Bray and Mehlich III analytical procedures.

As with phosphate, the suggested rates of potash vary with the soil test for potassium (K), expected yield, and placement (Table 25). A com-

<table>
<thead>
<tr>
<th>Table 24. Phosphate suggestions for corn production in Minnesota.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil test P (ppm)</td>
</tr>
<tr>
<td>v. low low medium high v. high</td>
</tr>
<tr>
<td>Expected Yield</td>
</tr>
<tr>
<td>Bray: 0-5 6-10 11-15 16-20 21+</td>
</tr>
<tr>
<td>Olsen: 0-3 4-7 8-11 12-15 16+</td>
</tr>
<tr>
<td>Bdcst Band Bdcst Band Bdcst Band Bdcst Band Bdcst Band</td>
</tr>
<tr>
<td>bu/acre</td>
</tr>
<tr>
<td>&lt; 100</td>
</tr>
<tr>
<td>60 30 40 20 25 20 10 10-15 0 10-15</td>
</tr>
<tr>
<td>100–124</td>
</tr>
<tr>
<td>75 40 50 25 30 20 10 10-15 0 10-15</td>
</tr>
<tr>
<td>125–150</td>
</tr>
<tr>
<td>85 45 60 30 35 25 10 10-15 0 10-15</td>
</tr>
<tr>
<td>150–175</td>
</tr>
<tr>
<td>100 50 70 35 40 30 15 10-15 0 10-15</td>
</tr>
<tr>
<td>175–200</td>
</tr>
<tr>
<td>110 55 75 40 45 30 15 10-15 0 10-15</td>
</tr>
<tr>
<td>200–225</td>
</tr>
<tr>
<td>130 65 90 45 55 30 20 10-15 0 10-15</td>
</tr>
<tr>
<td>225–250</td>
</tr>
<tr>
<td>145 75 100 50 60 30 20 10-15 0 10-15</td>
</tr>
<tr>
<td>250 +</td>
</tr>
<tr>
<td>160 80 115 60 70 35 25 10-15 0 10-15</td>
</tr>
<tr>
<td>* Use one of the following equations if a P2O5 guideline for a specific soil test value and a specific expected yield is desired.</td>
</tr>
<tr>
<td>P2O5rec = [0.700 - (.035 (Bray P ppm)] (expected yield)</td>
</tr>
<tr>
<td>P2O5rec = [0.700 - (.044 (Olsen P ppm)] (expected yield)</td>
</tr>
<tr>
<td>No phosphate fertilizer is suggested if the soil test for P is higher than 25 ppm (Bray) or 20 ppm (Olsen).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 25. Potash suggestions for corn production in Minnesota.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil test K (ppm)</td>
</tr>
<tr>
<td>v. low low medium high v. high</td>
</tr>
<tr>
<td>Expected Yield</td>
</tr>
<tr>
<td>0-40 41-80 81-120 121-160 160+</td>
</tr>
<tr>
<td>Bdcst Band Bdcst Band Bdcst Band Bdcst Band Bdcst Band</td>
</tr>
<tr>
<td>bu/acre</td>
</tr>
<tr>
<td>&lt; 100</td>
</tr>
<tr>
<td>100 50 75 40 45 30 15 10-15 0 10-15</td>
</tr>
<tr>
<td>100–124</td>
</tr>
<tr>
<td>120 60 90 45 50 30 20 10-15 0 10-15</td>
</tr>
<tr>
<td>125–149</td>
</tr>
<tr>
<td>145 75 105 55 60 40 20 10-15 0 10-15</td>
</tr>
<tr>
<td>150–174</td>
</tr>
<tr>
<td>165 85 120 60 70 40 25 10-15 0 10-15</td>
</tr>
<tr>
<td>175–199</td>
</tr>
<tr>
<td>185 90 135 70 80 50 25 10-15 0 10-15</td>
</tr>
<tr>
<td>200–220</td>
</tr>
<tr>
<td>210 105 155 80 90 55 30 10-15 0 10-15</td>
</tr>
<tr>
<td>220–240</td>
</tr>
<tr>
<td>235 120 165 85 100 60 30 10-15 0 10-15</td>
</tr>
<tr>
<td>240 +</td>
</tr>
<tr>
<td>255 130 180 90 110 65 35 15-20 0 10-15</td>
</tr>
<tr>
<td>* Use the following equation if a K2O guideline for a specific soil test value and a specific expected yield is desired.</td>
</tr>
<tr>
<td>K2Orec = [1.166 - 0.0073 (Soil Test K, ppm)] (expected yield)</td>
</tr>
<tr>
<td>No potash fertilizer is suggested if the soil test for K is 175 ppm or higher.</td>
</tr>
</tbody>
</table>
bination of broadcast and band applications is suggested when the soil test for K is in the range of 0-40 ppm. For fields with these values, plan on using the suggested rate in the band at planting, subtract this amount from the suggested broadcast rate, then broadcast and incorporate the remainder needed before planting.

Special Considerations

Because of the diversity in Minnesota’s soils and climate, rental and lease arrangements for land, and goals of individual growers, the phosphate and potash suggestions listed in Tables 24 and 25 cannot be rigid across the entire state. There are some special situations where rates might be changed. See University of Minnesota Extension folder FO-03790, Fertilizing Corn in Minnesota, for a description of this situation. A small decrease in soil test levels for P and K can be expected when phosphate and potash are used repeatedly in a banded fertilizer. Likewise, some reduction can be expected when low rates of phosphate and potash are used year after year. When soil test values decline, broadcast applications of higher rates of phosphate and/or potash fertilizers are justified if profitability and cash flow is favorable and the grower wants to maintain soil test values in the medium or high range.

The rate of fertilizer that can be applied in a band below and to the side of the seed at planting varies with the nutrient used, the distance between seed and fertilizer, and soil texture. See Use of Banded Fertilizer for Corn Production (FO-74250) for more information.

CAUTION! Do not apply urea, ammonium thiosulfate (12-0-0-26) or fertilizer containing boron in contact with the seed.

Sulfur Use

The addition of sulfur (S) to a fertilizer program should be a major consideration when corn is grown on sandy soils, reduced tillage systems, or in a long term continuous corn rotation.

The use of a soil test for sulfur is not a reliable predictor of the need for sulfur in a fertilizer program. Soil texture is a reliable predictor. If the soil texture is a loamy sand or sandy loam, either apply 12 to 15 lb S per acre in a banded fertilizer or broadcast and incorporate 25 lb S per acre before planting. Keep in mind that ammonium thiosulfate should not be placed in contact with the seed. This material will not harm germination or emergence if there is 1 inch of soil between seed and fertilizer. No sulfur is suggested on fine textured soils unless organic matter content in the top 6-8 inches is less than 3.0% or fields with long term continuous corn with high amounts of residue. In this case 10-15 lb. S per acre should be broadcast before planting.

There are several materials that can be used to supply S. Any fertilizer that supplies S in the sulfate (SO$_4^{2-}$-S) form is preferred. Because the greatest need for S occurs early in the growing season, application of any needed S in a starter fertilizer is preferred.

Magnesium Needs

Most Minnesota soils are well supplied with magnesium (Mg) and this nutrient is not usually needed in a fertilizer program. There are some exceptions. The very acid soils of east-central Minnesota might need Mg. There should be no need for the addition of Mg if dolomitic limestone has been applied for legume crops in the rotation. There is a soil test that can be used to predict the need for this nutrient. The suggestions for using Mg in a fertilizer program are summarized in Table 26.

Micronutrient Needs

Research trials conducted throughout Minnesota indicate that zinc (Zn) is the only micronutrient that may be needed in a fertilizer program for the corn crop. This nutrient, however, is not needed on all fields. The soil test for Zn is very reliable and will accurately predict the needs for this essential nutrient. The suggestions for Zn are summarized in Table 27.
The use of iron (Fe), copper (Cu), manganese (Mn), and boron (B) is not suggested for corn fertilizer programs in Minnesota.

Table 26. Suggestions for magnesium use for corn production.

<table>
<thead>
<tr>
<th>Magnesium soil test</th>
<th>Relative level</th>
<th>Mg to apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppm</td>
<td></td>
<td>Broadcast</td>
</tr>
<tr>
<td>0–50 Low</td>
<td></td>
<td>50–100</td>
</tr>
<tr>
<td>51–100 Medium</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>101 + Adequate</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

*Apply 10–20 lb. Mg per acre in a band only if a Mg deficiency is suspected or if a deficiency has been confirmed by plant analysis.

Table 27. Zinc suggestions for corn production in Minnesota.

<table>
<thead>
<tr>
<th>Zinc soil test*</th>
<th>Zinc to apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppm</td>
<td>Broadcast</td>
</tr>
<tr>
<td>0.0–0.25</td>
<td>10</td>
</tr>
<tr>
<td>0.26–0.50</td>
<td>10</td>
</tr>
<tr>
<td>0.50–0.75</td>
<td>5</td>
</tr>
<tr>
<td>0.76–1.00</td>
<td>0</td>
</tr>
<tr>
<td>1.01 +</td>
<td>0</td>
</tr>
</tbody>
</table>

* Zinc extracted by the DTPA procedure.

DRY EDIBLE BEAN

This crop is important in the rotations for farm enterprises in Central, West-Central, and Northwest Minnesota. Fertilizer suggestions are adjusted for growing situations. The suggestions that are appropriate for non-irrigated fine-textured soils may not be appropriate for irrigated sandy soils. The same reasoning applies for the opposite situation. Fertilizer guidelines for Minnesota are summarized in the paragraphs and tables that follow.

Nitrogen

Optimum yields of this crop depend on efficient use of nitrogen (N) fertilizers. Guidelines for N use can be based on the results of a soil NO$_3$-N test or the consideration of the combination of expected yield, previous crop, and soil organic matter content. The soil NO$_3$-N test is appropriate for use in Western Minnesota (See Figure 2). The soil NO$_3$-N is not recommended for sandy soils even though these soils may be in Western Minnesota.

\[ N_{nc} = (0.05) (EY) - STN_{(0-24\text{ in.})} - N_{pc} \]

Where:

- \( EY \) = expected yield (lb./acre)
- \( STN \) = nitrate-nitrogen (NO$_3$-N) measured to a depth of 24 in. (lb./acre)
- \( N_{pc} \) = amount of N supplied by the previous legume crop (lb./acre).

These N credits are summarized in Table 28.

Table 28. Nitrogen credits for various legume crops that might precede the edible bean crop in the rotation. Use these credits when the soil nitrate test is used.

<table>
<thead>
<tr>
<th>Legume Crop</th>
<th>1 Year Nitrogen Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvested alfalfa:</td>
<td></td>
</tr>
<tr>
<td>4 or more plants/ft$^2$</td>
<td>70</td>
</tr>
<tr>
<td>2 to 3 plants/ft$^2$</td>
<td>50</td>
</tr>
<tr>
<td>1 or fewer plants/ft$^2$</td>
<td>20</td>
</tr>
<tr>
<td>Red clover</td>
<td>35</td>
</tr>
</tbody>
</table>

The N fertilizer guidelines for situations where the soil NO$_3$-N test is not used are summarized in Table 29. These suggestions are appropriate for edible bean production on fine-textured soils. When grown on sandy soils under irrigation, a standard guideline of 120 lb. N per acre is used. If, on sandy soils, the edible beans follow alfalfa, a N credit of 70 lb. N per acre for the alfalfa crop is suggested.

Because of the high potential for diseases, if edible bean should follow soybeans, edible bean, peas, and other crops of edible bean, these crops are not considered as previous crops in the rotation.

Timing of the nitrogen application is an important consideration for edible bean production. In order to keep damage from white mold to a minimum, it’s important to keep the canopy
open as much as possible. The canopy may be closed at flowering if all of the N fertilizer is applied before planting. Therefore, split applications of fertilizer N are suggested. This is especially true for sandy soils. Research results show that delayed applications of fertilizer N do not reduce yields. Therefore, two applications of fertilizer N are suggested. The first application can be made approximately two weeks after planting. The second application can be made as late as is practical for field equipment. The second application should be timed so that this equipment does not damage the crop.

**Phosphate and Potash**

Current phosphate guidelines are summarized in Table 30. The guideline for potash use is in Table 31. The guidelines in these tables are for both broadcast and banded applications. There is no research to suggest that one placement is more efficient than the other. Recent research suggests that these immobile nutrients, when applied in a band near the seed at planting, produce a substantial increase in yield. Banded applications are an excellent option when suggested rates are low.

**Table 30. Phosphate fertilizer guidelines for edible bean production.**

<table>
<thead>
<tr>
<th>Phosphorus (P) Soil Test, ppm *</th>
<th>Expected Bray:</th>
<th>0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2O5 to apply (lb/acre)</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1400-1900</td>
<td>35</td>
<td>25</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1901-2400</td>
<td>45</td>
<td>30</td>
<td>20</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2401-2900</td>
<td>55</td>
<td>40</td>
<td>25</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2901 +</td>
<td>60</td>
<td>45</td>
<td>25</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Use one of the following equations if a phosphate guideline for a specific soil test and a specific expected yield is desired.

\[
P_{2O5\text{rec}} = [0.0231 - (0.0011) (\text{Bray P, ppm})] (\text{Expected Yield})
\]

\[
P_{2O5\text{rec}} = [0.0231 - (0.0014) (\text{Olsen P, ppm})] (\text{Expected Yield})
\]

**Table 31. Potash fertilizer guidelines for edible bean production.**

<table>
<thead>
<tr>
<th>Potassium (K) Soil Test, ppm *</th>
<th>Expected Yield</th>
<th>0-40</th>
<th>40-80</th>
<th>80-120</th>
<th>120-160</th>
<th>160 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K2O to apply (lb/acre)</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1400-1900</td>
<td>45</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1901-2400</td>
<td>55</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2401-2900</td>
<td>65</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2901 +</td>
<td>75</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Use the following equation if a potash guideline for a specific soil test and a specific expected yield is desired.

\[
K_{2O\text{rec}} = [0.0346 - (0.00042) (\text{Soil Test K, ppm})] (\text{Expected Yield})
\]

**Table 29. Nitrogen guidelines for edible bean grown on non-irrigated fine-textured soil and a soil NO3-N test is not used.**

<table>
<thead>
<tr>
<th>Crop Grown Last Year</th>
<th>Organic Matter Level*</th>
<th>Expected Yield (lb/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1401-1900</td>
</tr>
<tr>
<td>Alfalfa (4+ plants/ft²)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med high</td>
<td>0</td>
</tr>
<tr>
<td>Alfalfa (2-3 plants/ft²)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med high</td>
<td>0</td>
</tr>
<tr>
<td>Group 1 Crops</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med high</td>
<td>0</td>
</tr>
<tr>
<td>Group 2 Crops</td>
<td>Low</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Med high</td>
<td>30</td>
</tr>
</tbody>
</table>

*low = less than 3.0%; medium and high = 3.0% or more

Crops in Group 1:
Alfalfa, birdsfoot trefoil, grass/legume hay, grass legume pasture, fallow, red clover.

Crops in Group 2:
Barley, buckwheat, canola, corn, grass hay, grass pasture, oat, potato, rye, sorghum-sudan, sugar beet, sunflower, sweet corn, triticale, wheat.
Micronutrients

Past research with the edible bean crop has indicated that zinc (Zn) is the only micronutrient that may be needed in a fertilizer program. Zinc suggestions for both starter and broadcast application are listed in Table 32.

Research has shown that there are no other nutrients needed in a fertilizer program.

CAUTION! Do not apply any fertilizer in contact with the seed at planting.

Table 32. Zinc suggestions for edible bean production in Minnesota.

<table>
<thead>
<tr>
<th>Zinc soil test* ppm</th>
<th>Zinc to apply</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Broadcast</td>
</tr>
<tr>
<td>0.0–0.25</td>
<td>10</td>
</tr>
<tr>
<td>0.26–0.50</td>
<td>10</td>
</tr>
<tr>
<td>0.50–0.75</td>
<td>5</td>
</tr>
<tr>
<td>0.76–1.00</td>
<td>0</td>
</tr>
<tr>
<td>1.01 +</td>
<td>0</td>
</tr>
</tbody>
</table>

* Zinc extracted by the DTPA procedure.

GRASSES FOR HAY AND PASTURE

Several forage grasses and grass mixtures are adapted to Minnesota. As with other crops, adequate fertilizer programs are needed for optimum economic production. This is true for grasses grown for either hay or pasture.

Nitrogen

The grasses and grass mixtures, whether grown for hay or pasture, are perennial crops. Therefore, previous crop is not a consideration when making fertilizer guidelines. Nitrogen fertilizer guidelines are based on expected yield. The expected yield will vary with such factors as intended use, management intensity, and soil texture. The suggestions for each expected yield are listed in Table 33.

Table 33. Nitrogen guidelines for grasses and grass mixtures in Minnesota.

<table>
<thead>
<tr>
<th>Expected Yield</th>
<th>N to apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>ton dry matter/acre</td>
<td>lb./acre</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>4</td>
<td>120</td>
</tr>
<tr>
<td>4 +</td>
<td>150</td>
</tr>
</tbody>
</table>

Expected yields of 4 or more tons of dry matter per acre are reasonable for situations where soils have a good water holding capacity and intensive management practices such as the use of rotational grazing are used. Without irrigation, expected yields of 2 ton per acre are more reasonable when grasses are grown on sandy soils where moisture is usually limited. It’s not possible to assign a yield expectation for every situation in Minnesota where forage crops are grown. This is a decision for the individual managing the production of forage grasses.

The time of nitrogen fertilizer application should match the growth pattern of the forage grasses. With cool season grasses, the majority of the growth takes place in late spring and early summer. Therefore, early spring application of nitrogen is suggested for these grasses. Brome-grass, orchardgrass, and reed canarygrass are three major cool season grasses grown in Minnesota.

Timing for warm season grasses should be different. These grasses thrive when temperatures are warm in mid-summer. Therefore, a late spring application of nitrogen is suggested. Switchgrass is an example of a warm season grass.

Split application of nitrogen fertilizer is an option for intensive management situations when expected yields are greater than 4 ton per acre. If the split application is an option, 3/4 of the nitrogen should be applied in early spring and 1/4 in late August.

Phosphate and Potash

The phosphate fertilizer guidelines are listed in Table 34 while the potash fertilizer guidelines
are listed in Table 35. The listed rates are for all forage grasses and grass mixtures. The needed fertilizer should be broadcast to established stands in early spring for cool season grasses, and late spring for the warm season grasses.

Table 34. Phosphate fertilizer guidelines for grasses and grass mixtures.

<table>
<thead>
<tr>
<th>Soil Test</th>
<th>Expected Bray: 0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>Olsen: 0-3</td>
<td>4-7</td>
<td>8-11</td>
<td>12-15</td>
<td>16+</td>
</tr>
<tr>
<td>ton/acre</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bray P, ppm</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>4+</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2O5 to apply (lb./acre)</td>
<td>40</td>
<td>30</td>
<td>20</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Olsen P, ppm</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>4+</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2O5 to apply (lb./acre)</td>
<td>60</td>
<td>50</td>
<td>40</td>
<td>30</td>
</tr>
</tbody>
</table>

* Use one of the following equations if a phosphate guideline for a specific soil test and a specific expected yield is desired.

\[ P_{2O5}^{rec} = [19.12 – (0.723) (Bray P, ppm)] (Expected Yield) \]

\[ P_{2O5}^{rec} = [19.12 – (1.012) (Olsen P, ppm)] (Expected Yield) \]

Table 35. Potash fertilizer guidelines for grasses and grass mixtures.

<table>
<thead>
<tr>
<th>Soil Test</th>
<th>Expected Bray: 0-40</th>
<th>40-80</th>
<th>80-120</th>
<th>120-160</th>
<th>160+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>Olsen: 0-3</td>
<td>4-7</td>
<td>8-11</td>
<td>12-15</td>
<td>16+</td>
</tr>
<tr>
<td>ton/acre</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Soil Test K, ppm</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>4+</th>
</tr>
</thead>
<tbody>
<tr>
<td>K2O to apply (lb./acre)</td>
<td>90</td>
<td>60</td>
<td>30</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Soil Test K, ppm</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>4+</th>
</tr>
</thead>
<tbody>
<tr>
<td>K2O to apply (lb./acre)</td>
<td>110</td>
<td>80</td>
<td>50</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Soil Test K, ppm</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>4+</th>
</tr>
</thead>
<tbody>
<tr>
<td>K2O to apply (lb./acre)</td>
<td>120</td>
<td>90</td>
<td>60</td>
<td>30</td>
</tr>
</tbody>
</table>

* Use the following equation if a potash guideline for a specific soil test and a specific expected yield is desired.

\[ K_{2O}^{rec} = [40.43 – (0.286) (Soil Test K, ppm)] (Expected Yield) \]

Other Nutrients

Research trials in Minnesota have shown that forage grasses and grass mixtures have not responded to the application to other nutrients in a fertilizer program. Therefore, none are suggested.

GRASS-LEGUME MIXTURES

A wide variety of grass legume mixtures are adapted to Minnesota growing conditions. These mixtures are also a special challenge for fertilizer management which should be focused on maintaining both components (grasses, legumes) of the mixture.

Nitrogen

Use of nitrogen fertilizer is important for maintaining the grass component of the mixture. Excessive nitrogen will stimulate the growth of grasses which will crowd the legumes out of the mixture. Minimum rates will allow the legumes to crowd out the grasses. A rate of 60 lb. of nitrogen per acre is suggested for grass-legume mixtures. This nitrogen should be top-dressed to the established stands in early spring.

Phosphate and Potash

Fertilizers to supply phosphate and potash are necessary to maintain the legume component of the mixture. The suggestions for phosphate and potash use are listed in Tables 36 and 37. The suggested amounts should be top-dressed to established stands in early spring.

Table 36. Phosphate guidelines for grass-legume mixtures.

<table>
<thead>
<tr>
<th>Soil Test</th>
<th>Expected Bray: 0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>Olsen: 0-3</td>
<td>4-7</td>
<td>8-11</td>
<td>12-15</td>
<td>16+</td>
</tr>
<tr>
<td>ton/acre</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bray P, ppm</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>4+</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2O5 to apply (lb./acre)</td>
<td>35</td>
<td>25</td>
<td>15</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Olsen P, ppm</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>4+</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2O5 to apply (lb./acre)</td>
<td>55</td>
<td>40</td>
<td>25</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Olsen P, ppm</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>4+</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2O5 to apply (lb./acre)</td>
<td>70</td>
<td>50</td>
<td>30</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Olsen P, ppm</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>4+</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2O5 to apply (lb./acre)</td>
<td>90</td>
<td>65</td>
<td>40</td>
<td>15</td>
</tr>
</tbody>
</table>

* Use one of the following equations if a phosphate guideline for a specific soil test and a specific expected yield is desired.

\[ P_{2O5}^{rec} = [20 – (1.0) (Bray P, ppm)] (Expected Yield) \]

\[ P_{2O5}^{rec} = [20 – (1.4) (Olsen P, ppm)] (Expected Yield) \]
Table 37. Potash guidelines for grass-legume mixtures.

<table>
<thead>
<tr>
<th>Expected</th>
<th>Potassium (K) Soil Test, ppm *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>0-40</td>
</tr>
<tr>
<td>ton/acre</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>95</td>
</tr>
<tr>
<td>3</td>
<td>140</td>
</tr>
<tr>
<td>4</td>
<td>185</td>
</tr>
<tr>
<td>5</td>
<td>230</td>
</tr>
</tbody>
</table>

* Use the following equation if a potash guideline for a specific soil test and a specific expected yield is desired.

**KENTUCKY BLUEGRASS, TIMOTHY, REED CANARY GRASS, SEED PRODUCTION**

The fertilizer guidelines for seed production from these grasses are listed in Tables 38, 39, and 40. Except for new seedlings, the suggested fertilizer should be top-dressed to the established stands.

**Other Nutrients**

Sulfur is an important addition to a fertilizer program if alfalfa and red clover are the legumes included in the mixture. An annual application of 25 lb. sulfur per acre is suggested if the legumes are grown on sandy soils. Use of other nutrients has not increased dry matter production of grasses and legumes used in the various mixtures. Therefore, the use of other nutrients is not suggested at this time.

**Liming Considerations**

Maintaining a favorable soil pH is one key to maintaining legumes, especially alfalfa in the mixture. The suggested rate of lime should be broadcast and incorporated before the legumes are seeded. Use of lime will not maintain soil pH in the favorable range forever. When pH values drop into the acid range, alfalfa will probably disappear when it is mixed with grasses. Reseeding can be expensive and unless lime is incorporated, there is no way to reseed alfalfa to get a high yielding stand. Therefore, special attention to legumes other than alfalfa is suggested for soils where acid pH values are a problem. Some forage legumes are more tolerant than alfalfa to pH values in the acid range.

**Table 38. Nitrogen guidelines for grass seed production.**

<table>
<thead>
<tr>
<th>Field status</th>
<th>Mineral Soils</th>
<th>Organic Soils</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- - - N to apply (lb./acre) - - -</td>
<td></td>
</tr>
<tr>
<td>New seeding</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>Established stand</td>
<td>100</td>
<td>40</td>
</tr>
</tbody>
</table>

**Table 39. Phosphate guidelines for grass seed production (both new seedings and established stands).**

<table>
<thead>
<tr>
<th>Phosphorus (P) Soil Test</th>
<th>Bray Olsen</th>
<th>Phosphate to Apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>- - - ppm</td>
<td>- - -</td>
<td>- - - lb P2O5/acre</td>
</tr>
<tr>
<td>0-5</td>
<td>0-3</td>
<td>80</td>
</tr>
<tr>
<td>6-11</td>
<td>4-7</td>
<td>60</td>
</tr>
<tr>
<td>12-15</td>
<td>8-11</td>
<td>40</td>
</tr>
<tr>
<td>16-21</td>
<td>12-15</td>
<td>20</td>
</tr>
<tr>
<td>21 +</td>
<td>16 +</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 40. Potash guidelines for grass seed production.**

<table>
<thead>
<tr>
<th>Potassium (K) Soil Test</th>
<th>Potash to Apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>- - - ppm</td>
<td>- - - lb K2O/acre</td>
</tr>
<tr>
<td>0-40</td>
<td>120</td>
</tr>
<tr>
<td>41-80</td>
<td>90</td>
</tr>
<tr>
<td>81-120</td>
<td>60</td>
</tr>
<tr>
<td>121-160</td>
<td>30</td>
</tr>
<tr>
<td>161 +</td>
<td>0</td>
</tr>
</tbody>
</table>

There is no research to indicate that other nutrients are needed in a fertilizer program for grass seed production. Therefore, use of other nutrients is not suggested for this crop at this time.
MILLET

This crop is important in some farm enterprises in Minnesota. Fertilizer is an important production input for optimum yields. Recommendations for nitrogen, phosphate, and potash are summarized in the tables that follow.

**Nitrogen**

Nitrogen (N) fertilizer guidelines can be based on the results of the soil NO$_3$-N test or the consideration of the combination of expected yield, previous crop, and soil organic matter content. The soil nitrate test is appropriate for western Minnesota (see Figure 2).

When the soil nitrate test is used, the fertilizer N guidelines are calculated as follows.

\[ N_{rec} = (0.035) (EY) - STN \]  

Where:
- \( EY \) = expected yield (lb./acre)
- \( STN \) = nitrate-nitrogen (NO$_3$-N) measured to a depth of 24 in. (lb./acre)
- \( N_{pc} \) = amount of N supplied by the previous legume crop (lb./acre).

These N credits are summarized in Table 6.

Crops in Group 1:
- Alsike clover, birdsfoot trefoil, grass/legume hay, grass legume pasture, fallow, red clover.

Crops in Group 2:
- Barley, buckwheat, canola, corn, grass hay, grass pasture, oat, potato, rye, sorghum-sudan, sugar beet, sunflower, sweet corn, triticale, wheat.

**Phosphate and Potash**

Current phosphate guidelines are summarized in Table 42. Guidelines for potash are in Table 43. The guidelines listed in these tables are intended for broadcast application. The sensitivity of this crop to banded application of fertilizers is not known.

**CAUTION!** Do not apply N as urea (46-0-0) in contact with the seed at planting. Do not apply ammonium thiosulfate (12-0-0-26) or boron in contact with the seed.

### Table 41. Nitrogen fertilizer guidelines for millet for situations where the soil NO$_3$-N test is not used.

<table>
<thead>
<tr>
<th>Crop Grown Last Year</th>
<th>Organic Matter Level*</th>
<th>Expected Yield (lb./acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1500-1900</td>
</tr>
<tr>
<td>Alfalfa (4+ plants/ft$^2$)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Alfalfa (2-3 plants/ft$^2$)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Soybeans</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td>Edible beans, field peas,</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Group 1 Crops</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Group 2 Crops</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
</tbody>
</table>

*Low = less than 3.0%; medium and high = 3.0% or more
Table 42. Phosphate guidelines for millet production.

<table>
<thead>
<tr>
<th>Expected Yield</th>
<th>Phosphorus (P) Soil Test, ppm *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bray</td>
<td>0-5</td>
</tr>
<tr>
<td>Olsen</td>
<td>0-3</td>
</tr>
<tr>
<td>lb/acre</td>
<td>- - -</td>
</tr>
<tr>
<td>1500-1900</td>
<td>25</td>
</tr>
<tr>
<td>1901-2300</td>
<td>30</td>
</tr>
<tr>
<td>2301-2700</td>
<td>40</td>
</tr>
<tr>
<td>2701-3100</td>
<td>45</td>
</tr>
<tr>
<td>3100 +</td>
<td>45</td>
</tr>
</tbody>
</table>

* Use one of the following equations if a phosphate guideline for a specific soil test and a specific expected yield is desired.

\[
P₂O₅\text{rec} = [0.0171 - (0.0085) (\text{Bray P, ppm})] (\text{Expected Yield})
\]

\[
P₂O₅\text{rec} = [0.0171 - (0.00114) (\text{Olsen P, ppm})] (\text{Expected Yield})
\]

Table 43. Potash guidelines for millet production.

<table>
<thead>
<tr>
<th>Expected Yield</th>
<th>Potassium (K) Soil Test, ppm *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>0-40</td>
</tr>
<tr>
<td>lb/acre</td>
<td>- - -</td>
</tr>
<tr>
<td>1500-1900</td>
<td>45</td>
</tr>
<tr>
<td>1901-2300</td>
<td>55</td>
</tr>
<tr>
<td>2301-2700</td>
<td>65</td>
</tr>
<tr>
<td>2701-3100</td>
<td>75</td>
</tr>
<tr>
<td>3100 +</td>
<td>80</td>
</tr>
</tbody>
</table>

* Use the following equation if a potash guideline for a specific soil test and a specific expected yield is desired.

\[
K₂O\text{rec} = [0.03 - (0.00018) (\text{Soil Test K, ppm})] (\text{Expected Yield})
\]

There is no research evidence which suggests that sulfur and the micronutrients are needed for optimum production of this crop. Therefore, there is no suggestion to add these nutrients to a fertilizer program.

OAT

In Minnesota, the oat crop is used for either grain and straw or as a nurse crop for seeding legumes. The recommendations in the tables that follow are intended for situations where the crop is grown for grain and straw.

Nitrogen

Nitrogen (N) fertilizer guidelines can be based on the results of the soil NO₃-N test or a consideration of the combination of expected yield, previous crop, and soil organic matter content. The soil nitrate test is appropriate for western Minnesota (see Figure 2).

When the soil nitrate is used, the fertilizer N guidelines are calculated as follows:

\[
N\text{rec} = (1.3) (\text{EY}) - \text{STN}_{(0-24\text{ in.})} - N\text{pc}
\]

Where:

- \( EY \) = expected yield (lb./acre)
- \( \text{STN} \) = nitrate-nitrogen (NO₃-N) measured to a depth of 24 in. (lb./acre)
- \( N\text{pc} \) = amount of N supplied by the previous legume crop (lb./acre).

These N credits are summarized in Table 6.

The N fertilizer guidelines for situations where the soil NO₃-N test is not used are summarized in Table 44.

Crops in Group 1:
- Alsike clover, birdsfoot trefoil, grass/legume hay, grass legume pasture, fallow, red clover.

Crops in Group 2:
- Barley, buckwheat, canola, corn, grass hay, grass pasture, oat, potato, rye, sorghum-sudan, sugar beet, sunflower, sweet corn, triticale, wheat.

Nitrogen, when needed, can be supplied from several sources. If applied in a way to prevent loss, all sources of nitrogen have an equal effect on yield. When using either dry or liquid sources, the fertilizer N can be broadcast and incorporated before planting. If anhydrous ammonia is the preferred source, this N fertilizer can be knifed in before planting.

Phosphate and Potash

Current phosphate guidelines are listed in Table 45. Guidelines for potash use are in Table 46. The rates listed are appropriate for both broadcast and banded (drill applied) application. There is no research evidence with this crop to suggest that the banded placement is more efficient than a broadcast application.
Table 45. Phosphate guidelines for oat production.

<table>
<thead>
<tr>
<th>Crop Grown Last Year</th>
<th>Organic Matter Level*</th>
<th>Expected Yield (bu./acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>40-60</td>
</tr>
<tr>
<td>Alfalfa (4+ plants/ft²)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Alfalfa (2-3 plants/ft²)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Soybeans</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td>Alfalfa (1 or less plants/ft²)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Edible beans, field peas</td>
<td>Low</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>10</td>
</tr>
<tr>
<td>Group 1 Crops</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Group 2 Crops</td>
<td>Low</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>30</td>
</tr>
</tbody>
</table>

* Use one of the following equations if a phosphate guideline for a specific soil test and a specific expected yield is desired.

\[ P_{2}O_{5\,rec} = [0.644 - (0.032) (\text{Bray P, ppm})] \times (\text{Expected Yield}) \]

\[ P_{2}O_{5\,rec} = [0.644 - (0.041) (\text{Olsen P, ppm})] \times (\text{Expected Yield}) \]

Table 46. Potash guidelines for oat production.

<table>
<thead>
<tr>
<th>Expected Yield (bu./acre)</th>
<th>Potassium (K) Soil Test, ppm *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-40</td>
</tr>
<tr>
<td>40-60</td>
<td>55</td>
</tr>
<tr>
<td>61-80</td>
<td>75</td>
</tr>
<tr>
<td>81-100</td>
<td>95</td>
</tr>
<tr>
<td>101-120</td>
<td>115</td>
</tr>
<tr>
<td>121 +</td>
<td>130</td>
</tr>
</tbody>
</table>

* Use the following equation if a potash guideline for a specific soil test and a specific expected yield is desired.

\[ K_{2}O_{\,rec} = [1.277 - (0.0086) (\text{Soil Test K, ppm})] \times (\text{Expected Yield}) \]

CAUTION! Do not apply more than 20 lb. N per acre as urea (46-0-0) with the drill. Do not place ammonium thiosulfate (12-0-0-26) in direct contact with the seed. Do not place fertilizers containing boron in direct contact with the seed.

Other Nutrients

Except for the need for sulfur (S) when this crop is grown on sandy soils, other nutrients are not needed in a fertilizer program. For production on sandy soils, either use 10-12 lb. S/acre with the drill at planting or broadcast 25 lb. S/acre and incorporate before planting.

RED CLOVER, ALSIKE CLOVER, BIRDSFOOT TREFOIL

These legume crops, if properly inoculated, can take needed nitrogen from the atmosphere and fertilizer N will not be needed after the crop is established. A small amount (less than 25 lb. N/acre) may aid in getting successful establishment on sandy soils. Fertilizer N will not be needed for establishment on soils that are not sandy.
The phosphate suggestions for these crops are summarized in Table 47. The potash guidelines are in Table 48. Phosphate and/or potash fertilizers can be topdressed to established stands on an annual basis. The suggested rates of these two nutrients can also be broadcast and incorporated before seeding. This management practice may help in achieving a satisfactory stand.

### Table 47. Phosphate guidelines for red clover, alsike clover, and birdsfoot trefoil.

<table>
<thead>
<tr>
<th>Phosphorus (P) Soil Test, ppm</th>
<th>Expected Bray:</th>
<th>0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Olsen:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ton/acre</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>35</td>
<td>25</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>55</td>
<td>40</td>
<td>25</td>
<td>10</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>50</td>
<td>30</td>
<td>10</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>90</td>
<td>65</td>
<td>40</td>
<td>15</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

*Use one of the following equations if a phosphate guideline for a specific soil test and a specific expected yield is desired.

\[
P_{2}O_{5\text{rec}} = [20 - (1.0) \times (\text{Bray P, ppm})] \times (\text{Expected Yield})
\]

\[
P_{2}O_{5\text{rec}} = [20 - (1.4) \times (\text{Olsen P, ppm})] \times (\text{Expected Yield})
\]

### Table 48. Potash guidelines for red clover, alsike clover, and birdsfoot trefoil.

<table>
<thead>
<tr>
<th>Expected Potassium (K) Soil Test, ppm</th>
<th>Yield 0-40</th>
<th>41-80</th>
<th>81-120</th>
<th>121-160</th>
<th>161 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>ton/acre</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>95</td>
<td>65</td>
<td>40</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>140</td>
<td>100</td>
<td>60</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>185</td>
<td>135</td>
<td>80</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>230</td>
<td>165</td>
<td>100</td>
<td>35</td>
<td>0</td>
</tr>
</tbody>
</table>

*Use the following equation if a potash guideline for a specific soil test and a specific expected yield is desired.

\[
K_{2}O_{\text{rec}} = [53.28 - (0.333) \times (\text{Soil Test K, ppm})] \times (\text{Expected Yield})
\]

These legumes will respond to the application of lime if the soil pH is less than 6.0. Lime suggestions for these crops have not been well defined. An application of 3,000 lb. ENP per acre is suggested for these legumes grown on acid soils. The lime should be broadcast and incorporated before seeding.

Except for the need for sulfur (S) when these crops are grown on sandy soils, other nutrients are not needed in a fertilizer program. Use an annual broadcast application of 25 lb. S per acre when these crops are grown on sandy soils.

---

**Rye**

Although the number of acres planted to this crop is not large, it remains a major component of some farm enterprises in Minnesota. This is a favorite crop used in rotation for those who farm sandy soils that are not irrigated. Fertilizer use is a major factor in attaining profitable yields.

### Nitrogen

The majority of this crop is grown on sandy soils. Since the soil test for NO₃-N is **NOT** suggested for use on sandy soils, guidelines for nitrogen use are based on a consideration of expected yield, previous crop, and soil organic matter content. Those guidelines are summarized in Table 49.

Crops in Group 1:
- Alsike clover, birdsfoot trefoil, grass/legume hay, grass legume pasture, fallow, red clover.

Crops in Group 2:
- Barley, buckwheat, canola, corn, grass hay, grass pasture, oat, potato, rye, sorghum-sudan, sugar beet, sunflower, sweet corn, triticale, wheat.

The topdress application to established stands in early spring is suggested. There is no need for the use of split applications.

### Phosphate and Potash

The guidelines for phosphate use are listed in Table 50. Suggestions for potash use are in Table 51. The suggested rates of phosphate and potash should be broadcast and incorporated before planting.
Table 50. Phosphate guidelines for rye production.

<table>
<thead>
<tr>
<th>Expected Yield (bu./acre)</th>
<th>Bray: 0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21+</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-49</td>
<td>40</td>
<td>30</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50-59</td>
<td>50</td>
<td>35</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60-69</td>
<td>60</td>
<td>45</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>70-79</td>
<td>70</td>
<td>50</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>80+</td>
<td>80</td>
<td>55</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Use one of the following equations if a phosphate guideline for a specific soil test and a specific expected yield is desired.

\[
P_2O_5 \text{rec} = [1.071 - (0.054) (\text{Bray P, ppm})] (\text{Expected Yield})
\]

\[
P_2O_5 \text{rec} = [1.071 - (0.067) (\text{Olsen P, ppm})] (\text{Expected Yield})
\]

Table 51. Potash guidelines for rye production.

<table>
<thead>
<tr>
<th>Expected Yield (bu./acre)</th>
<th>Potassium (K) Soil Test, ppm *</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-49</td>
<td>41-80</td>
</tr>
<tr>
<td>50-59</td>
<td>81-120</td>
</tr>
<tr>
<td>60-69</td>
<td>121-160</td>
</tr>
<tr>
<td>70-79</td>
<td>161+</td>
</tr>
<tr>
<td>80+</td>
<td>190</td>
</tr>
</tbody>
</table>

* Use the following equation if a potash guideline for a specific soil test and a specific expected yield is desired.

\[
K_2O \text{rec} = [2.710 - (0.017) (\text{Soil Test K, ppm})] (\text{Expected Yield})
\]

Other Nutrients

Use of other nutrients in a fertilizer program has not increased rye yields in Minnesota. Therefore, use of other nutrients is not suggested at this time.

SOYBEAN

Soybean is an important crop in Minnesota and provides a significant return in many farm enterprises. Yields will be reduced when essential nutrients are deficient. Therefore, profitable fertilizer programs must be developed to maximize yields.

Nitrogen

The soybean is a legume and if properly inoculated, can use the nitrogen in the atmosphere (N\textsubscript{2}) for plant growth. Therefore, nitrogen fertilizer is not needed for soybean production in most situations.

Nitrogen fertilizer use for soybean production in the Red River Valley deserves special consideration. Research in the region has shown that the use of fertilizer N may increase yields when

Table 49. Nitrogen fertilizer guidelines for rye production.

<table>
<thead>
<tr>
<th>Crop Grown Last Year</th>
<th>Organic Matter Level*</th>
<th>Expected Yield (bu./acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40-49</td>
<td>50-59</td>
</tr>
<tr>
<td>Alfalfa (4+ plants/ft\textsuperscript{2})</td>
<td>Low Med and high</td>
<td>0 0 35 60 95</td>
</tr>
<tr>
<td>Alfalfa (2-3 plants/ft\textsuperscript{2})</td>
<td>Low Med and high</td>
<td>0 0 40 65 90</td>
</tr>
<tr>
<td>Soybeans Alfalfa (1 or less plants/ft\textsuperscript{2})</td>
<td>Low Med and high</td>
<td>40 65 90 115 140</td>
</tr>
<tr>
<td>Edible beans, field peas</td>
<td>Low Med and high</td>
<td>20 45 70 95 120</td>
</tr>
<tr>
<td>Group 1 Crops</td>
<td>Low Med and high</td>
<td>0 35 60 85 110</td>
</tr>
<tr>
<td>Group 2 Crops</td>
<td>Low Med and high</td>
<td>60 85 110 135 160</td>
</tr>
</tbody>
</table>

* low = less than 3.0%; medium and high = 3.0% or more
producers have experienced problems in getting good nodulation and the amount of NO$_3$--N to a depth of 24 inches is less than 75 lb./acre. For these situations, use of some N (50 to 75 lb./acre) in a fertilizer program may be beneficial. The amount of NO$_3$--N to a depth of 24 inches should be measured before nitrogen fertilizer is applied.

Phosphate and Potash

Phosphate fertilizer guidelines for soybean production are listed in Table 52. The suggestions for potash use are provided in Table 53. The suggested rates of phosphate and/or potash are not adjusted for placement. A summary of research from Minnesota and neighboring states leads to the conclusion that neither banded nor broadcast placement is consistently superior if adequate rates of phosphate and/or potash are used. Soybean seeds are very sensitive to fertilizer placed on or near the seed row so fertilizer should not be banded with the seed as a “pop-up” fertilizer application at the time of planting.

Timing of the phosphate application is an important consideration when fertilizing soybeans, especially when the soil pH is 7.4 or higher. The phosphate should be applied in the spring before planting to reduce the time interval for contact between soil and fertilizer.

Table 52. Phosphate fertilizer suggestions for soybean production in Minnesota.

<table>
<thead>
<tr>
<th>Expected Yield (bu./acre)</th>
<th>Phosphorus (P) Soil Test, ppm *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bray</td>
</tr>
<tr>
<td></td>
<td>0-5</td>
</tr>
<tr>
<td></td>
<td>6-10</td>
</tr>
<tr>
<td></td>
<td>11-15</td>
</tr>
<tr>
<td></td>
<td>16-20</td>
</tr>
<tr>
<td></td>
<td>21 +</td>
</tr>
<tr>
<td></td>
<td>Olsen</td>
</tr>
<tr>
<td></td>
<td>0-3</td>
</tr>
<tr>
<td></td>
<td>4-7</td>
</tr>
<tr>
<td></td>
<td>8-11</td>
</tr>
<tr>
<td></td>
<td>12-15</td>
</tr>
<tr>
<td></td>
<td>16 +</td>
</tr>
<tr>
<td></td>
<td>P$_2$O$_5$ to apply (lb./acre)</td>
</tr>
<tr>
<td>Less than 30</td>
<td>50</td>
</tr>
<tr>
<td>30-39</td>
<td>60</td>
</tr>
<tr>
<td>40-49</td>
<td>70</td>
</tr>
<tr>
<td>50-59</td>
<td>80</td>
</tr>
<tr>
<td>60 +</td>
<td>90</td>
</tr>
</tbody>
</table>

* Use one of the following equations if a phosphate suggestion for a specific soil test and a specific expected yield is desired.

P$_2$O$_5$$_{rec} = [1.752 - (0.0836) (Bray P, ppm)] (Expected Yield)

P$_2$O$_5$$_{rec} = [1.752 - (0.1114) (Olsen P, ppm)] (Expected Yield)

Table 53. Potash fertilizer suggestions for soybean production in Minnesota.

<table>
<thead>
<tr>
<th>Expected Yield (bu./acre)</th>
<th>Potassium (K) Soil Test, ppm *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>41-80</td>
</tr>
<tr>
<td></td>
<td>81-120</td>
</tr>
<tr>
<td></td>
<td>121-160</td>
</tr>
<tr>
<td></td>
<td>161 +</td>
</tr>
<tr>
<td></td>
<td>K$_2$O to apply (lb./acre)</td>
</tr>
<tr>
<td>Less than 30</td>
<td>55</td>
</tr>
<tr>
<td>30-39</td>
<td>65</td>
</tr>
<tr>
<td>40-49</td>
<td>80</td>
</tr>
<tr>
<td>50-59</td>
<td>100</td>
</tr>
<tr>
<td>60 +</td>
<td>110</td>
</tr>
</tbody>
</table>

* Use the following equation if a potash suggestion for a specific soil test and a specific expected yield is desired.

K$_2$O$_{rec} = [2.2 - (0.0183) (Soil Test K,ppm)] (Expected Yield)

Other Nutrients

Research in Minnesota has shown that soybeans do not respond to the application of other nutrients in a fertilizer program. Manganese deficiency has been reported in glyphosate resistant soybeans in areas of the Eastern Corn Belt in areas traditionally responsive to the nutrient, but research conducted in Minnesota has not shown a benefit to soil or foliar applied manganese on soybean.

Iron deficiency chlorosis (IDC) is a serious concern in western Minnesota. In these situations, there is an ample supply of iron in the soil. However, for reasons that are not completely understood, the soybean plant is not able to take up the iron needed for optimum growth. Research has shown a significant greening effect on soybeans and sometimes a yield increase when a 6% ortho-ortho EDDHA iron product is placed with the seed at rates of 1-3 lb. of product per acre. For best results apply EDDHA chelate must be placed in contact with the seed at planting. Planting an oats companion crop has also been shown to decrease the severity of IDC seeding at a rate of 1.5 bu./acre prior to planting soybeans. However, the oats must be left to grow to and sprayed with a herbicide by the time they are 10 inches tall to prevent over competition with soybean.
SUGAR BEET

Optimum sugar beet production in Minnesota and North Dakota is built on a sound fertility program. There is a financial reward for delivering a high quality product to the factories. The quality of the harvested sugar beet is affected by the fertilizer that is supplied.

Nitrogen

Nitrogen is the most important nutrient when planning a fertilizer program for sugar beet production. Nitrogen fertilization promotes vigorous early-season growth thereby reducing the number of days to canopy closure. Early closure allows the sugar beet to make better use of sunlight and more sugar is produced. Excess nitrogen at or near the end of the growing season reduces sugar beet quality by reducing sucrose concentration. The highest quality sugar beet is produced when nitrogen deficiency occurs late in the growing season (about 6 weeks prior to harvest).

The amount of nitrogen fertilizer suggested should be adjusted for the amount of NO$_3$--N measured in the soil profile to a depth of 4 ft. The nitrogen fertilizer guideline will depend on the location that the sugarbeet is grown. For the Minn-Dak and American Crystal growing areas, a total of 130 lbs per acre as soil test NO$_3$--N in the surface 4 ft. plus fertilizer N is needed. If a grower is unable to get a soil sample to 4 ft and if there are small amounts of NO$_3$--N at a depth of 2 to 4 feet are suspected, a soil test to a depth of 2 ft. can be used. The total N would be 110 lb per acre soil test NO$_3$--N plus fertilizer N. In the Southern Minnesota Beet Sugar Cooperative growing area, the amount of NO$_3$--N for a 4 ft soil test and fertilizer should be 100 lbs per acre and for a 2 ft. soil test, the total should be 80 lbs per acre.

Results of various field research projects have shown that all nitrogen fertilizers will have an equal effect on production if applied in a way that loss of any nitrogen is minimized. Fall appli-
Table 55. Potash guidelines for sugar beet production.

<table>
<thead>
<tr>
<th>Potassium (K) Soil Test</th>
<th>Potash to Apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>- - - ppm - - -</td>
<td>- - - lb K₂O/acre - - -</td>
</tr>
<tr>
<td>0-40</td>
<td>110</td>
</tr>
<tr>
<td>41-80</td>
<td>80</td>
</tr>
<tr>
<td>81-120</td>
<td>50</td>
</tr>
<tr>
<td>121-160</td>
<td>15</td>
</tr>
<tr>
<td>161 +</td>
<td>0</td>
</tr>
</tbody>
</table>

Other Nutrients

In Minnesota and North Dakota growing areas, the use of sulfur, zinc, magnesium, calcium, boron, iron, copper, and manganese has had no effect on either the yield or the quality of the sugar beet crop. Therefore, the use of these nutrients is not needed.

Cautions

Those who choose to place fertilizer with the seed should use caution. Applying more than 5 lb. per acre of N + K₂O in contact with the seed can reduce emergence and subsequent stands. The use of 10-34-0 at rates less than 4 gallons per acre in 22 inch rows has not been harmful. The potential for reduced stand resulting from fertilizer placed with the seed increases as the moisture content of the soil decreases.

SUNFLOWER

Sunflower will respond to fertilization. Nitrogen, phosphate, and potash are important. The appropriate recommendations are listed in the tables that follow.

Nitrogen

Nitrogen (N) fertilizer guidelines can be based on the results of a soil NO₃-N test or the consideration of expected yield, previous crop, and soil organic matter content. The soil NO₃-N test is appropriate for western Minnesota (see Figure 2). When the soil nitrate test is used, the fertilizer N guidelines are calculated as follows:

\[ N_{rec} = (0.05) \times (EY) - STN_{(0-24 \text{ in.)}} - N_{pc} \]

Where:

- \( EY \) = expected yield (lb./acre)
- \( STN \) = nitrate-nitrogen (NO₃-N) measured to a depth of 24 in. (lb./acre)
- \( N_{pc} \) = amount of N supplied by the previous legume crop (lb./acre).

These N credits are summarized in Table 6.

The N fertilizer guidelines for situations where the soil NO₃-N test is not used are summarized in Table 56.

Crops in Group 1:
Alsike clover, birdsfoot trefoil, grass/legume hay, grass legume pasture, fallow, red clover.

Crops in Group 2:
Barley, buckwheat, canola, corn, grass hay, grass pasture, oat, potato, rye, sorghum-sudan, sugar beet, sunflower, sweet corn, triticale, wheat.

Phosphate and Potash

Current phosphate recommendations are summarized in Table 57. Recommendations for potash use are in Table 58.

**CAUTION!** Do not apply more than 10 lb N + K₂O per acre in contact with the seed. Do not place ammonium thiosulfate (12-0-0-26) in direct contact with the seed. Do not place fertilizers containing boron in direct contact with the seed.
Table 56. Nitrogen fertilizer guidelines for sunflower production for situations where the soil NO$_3$-N test is not used.

<table>
<thead>
<tr>
<th>Crop Grown Last Year</th>
<th>Organic Matter Level*</th>
<th>Expected Yield (lb./acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1400-1900</td>
<td>1901-2400</td>
</tr>
<tr>
<td>Alfalfa (4+ plants/ft$^2$)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Alfalfa (2-3 plants/ft$^2$)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Soybeans</td>
<td>Low</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Group 1 Crops</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>0</td>
</tr>
<tr>
<td>Group 2 Crops</td>
<td>Low</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Med and high</td>
<td>40</td>
</tr>
</tbody>
</table>
* low = less than 3.0%; medium and high = 3.0% or more

Table 57. Phosphate fertilizer suggestions for sunflower production in Minnesota.

<table>
<thead>
<tr>
<th>Phosphorus (P) Soil Test, ppm *</th>
<th>Brady: 0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>Olsen: 0-3</td>
<td>4-7</td>
<td>8-11</td>
<td>12-15</td>
<td>16 +</td>
</tr>
<tr>
<td>lb/acre</td>
<td>- - - -</td>
<td>P$_2$O$_5$ to apply (lb./acre) - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1400-1900</td>
<td>55</td>
<td>35</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1901-2400</td>
<td>65</td>
<td>45</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2401-2900</td>
<td>75</td>
<td>55</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2901-3300</td>
<td>85</td>
<td>65</td>
<td>25</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>3300 +</td>
<td>90</td>
<td>70</td>
<td>30</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>
* Use one of the following equations if a phosphate guideline for a specific soil test and a specific expected yield is desired.

\[ P_{2O_5r} = (0.0225 - 0.0011) \times (Bray \text{ P ppm}) \times (Expected \text{ Yield}) \]

\[ P_{2O_5r} = (0.0225 - 0.0014) \times (Olsen \text{ P ppm}) \times (Expected \text{ Yield}) \]

Table 58. Potash fertilizer suggestions for sunflower production in Minnesota.

<table>
<thead>
<tr>
<th>Potassium (K) Soil Test, ppm *</th>
<th>0-40</th>
<th>41-80</th>
<th>81-120</th>
<th>121-160</th>
<th>161 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>- - - -</td>
<td>K$_2$O to apply (lb./acre) - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lb/acre</td>
<td>1400-1900</td>
<td>55</td>
<td>40</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>1901-2400</td>
<td>75</td>
<td>50</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>2401-2900</td>
<td>90</td>
<td>65</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>2901-3300</td>
<td>110</td>
<td>75</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>3300 +</td>
<td>115</td>
<td>80</td>
<td>45</td>
<td>25</td>
</tr>
</tbody>
</table>
* Use the following equation if a potash guideline for a specific soil test and a specific expected yield is desired.

\[ K_{2O_r} = (0.0410 - 0.00027) \times (Soil \text{ Test K ppm}) \times (Expected \text{ Yield}) \]

Other Nutrients

Research trials conducted in Minnesota have shown that other nutrients are not needed in a fertilizer program for sunflower production.

WHEAT

With 1 to 2 million acres planted annually, wheat is a major crop in Minnesota’s agriculture. When diseases and other crop pests are not limiting, average yields continue to increase slowly with time. Adequate and efficient use of fertilizer has been a major contributor to this increase.

Nitrogen Suggestions

The modern wheat grower receives more return for money spent on nitrogen (N) than any other nutrient. It is important to focus on using this nutrient as efficiently as possible.

Two strategies are used for making suggestions for the amount of fertilizer N to use for wheat production in Minnesota. For the western portion of the state where most of the wheat is grown, the soil NO$_3$-N test (soil samples col-
lected to 2 feet) is the best and most accurate management tool for predicting the amount of fertilizer N to use. This soil test is suggested if wheat is grown in the shaded area of the state shown in Figure 2.

If the soil nitrate test is used, the amount of fertilizer N required to meet the yield goal is calculated from the following equation:

\[ N_{rec} = (2.5) (EY) - STN_{(0-24 \text{ in.})} - N_{pc} \]

Where:
- \( EY \) = expected yield (bu./acre)
- \( STN \) = nitrate-nitrogen (NO\(_3\)-N) measured to a depth of 24 in. (lb./acre)
- \( N_{pc} \) = amount of N supplied by the previous legume crop (lb./acre).

These N credits are summarized in Table 59.

If wheat is grown in the second year following any of the crops in Table 59, use the N credit listed in Table 60.

**Table 59. Nitrogen credits for various crops that might precede wheat in a crop rotation. Use these credits when the soil nitrate test is used.**

<table>
<thead>
<tr>
<th>Previous Crop</th>
<th>1st Year Nitrogen Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybeans</td>
<td>20</td>
</tr>
<tr>
<td>Edible Beans, Field Peas</td>
<td>10</td>
</tr>
<tr>
<td>Harvested alfalfa(^{1/2})</td>
<td></td>
</tr>
<tr>
<td>4-5 or more plants/ft(^2)</td>
<td>75</td>
</tr>
<tr>
<td>2-3 or more plants/ft(^2)</td>
<td>50</td>
</tr>
<tr>
<td>1-2 plants/ft(^2)</td>
<td>25</td>
</tr>
<tr>
<td>1 or fewer plants/ft(^2)</td>
<td>0</td>
</tr>
<tr>
<td>Harvested Red Clover</td>
<td>35</td>
</tr>
<tr>
<td>Sugar Beet</td>
<td></td>
</tr>
<tr>
<td>Yellow Leaves</td>
<td>0</td>
</tr>
<tr>
<td>Yellow-green Leaves</td>
<td>15 to 20</td>
</tr>
<tr>
<td>Dark-green Leaves</td>
<td>60 to 70</td>
</tr>
</tbody>
</table>

\(^{1/2}\) If 3rd or 4th cutting was not harvested, add 20 lb. N per acre to the N credits listed.

**Table 60. Nitrogen credits for some forage legumes if wheat is planted two years after the legume.**

<table>
<thead>
<tr>
<th>Legume Crop</th>
<th>2nd Year Nitrogen Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvested alfalfa:</td>
<td></td>
</tr>
<tr>
<td>4 or more plants/ft(^2)</td>
<td>35</td>
</tr>
<tr>
<td>2 to 3 plants/ft(^2), Birdsfoot Trefoil</td>
<td>25</td>
</tr>
<tr>
<td>Red clover</td>
<td>20</td>
</tr>
</tbody>
</table>

For situations where the soil NO\(_3\)-N test is not used, suggestions for fertilizer N are based on a consideration of previous crop, expected yield, and soil organic matter content. The soil NO\(_3\)-N test is not used for making nitrogen fertilizer guidelines for wheat grown in eastern and southern Minnesota (the area which is not shaded in Figure 2). Nitrogen fertilizer guidelines for these situations are summarized in Table 61. Use the fertilizer N guidelines for soils having a high organic matter content when wheat is grown is southeast Minnesota. This statement applies in Goodhue, Wabasha, Olmsted, Winona, Fillmore, and Houston Counties.

The nitrogen supplied by legume crops can also be utilized by the wheat crop if it is planted 2 years after the legume. The nitrogen credits for these situations are summarized in Table 60. Subtract these values from the N guidelines that are listed for crops in Group 2 (Table 61) when wheat is planted 2 years after a legume crop.

Nitrogen from the decomposing tops of a previous crop of sugar beet can be used by the wheat crop when it follows in a rotation. These N credits are based on the overall color of the sugar beet tops at harvest and are listed in Table 59. If the soil NO\(_3\)-N test is used for nitrogen guidelines, the value for the appropriate color should be used as the nitrogen credit from the previous crop (\( N_{pc} \)) in the N guideline equation. If the N recommendations are taken from Table 61, subtract the value for the appropriate color from the appropriate N guideline listed in the table.
Crops in Group 1:
Alsike clover, birdsfoot trefoil, grass/legume hay, grass legume pasture, fallow, red clover.

Crops in Group 2:
Barley, buckwheat, canola, corn, grass hay, grass pasture, oat, potato, rye, sorghum-sudan, sugar beet, sunflower, sweet corn, triticale, wheat.

In-season applications of liquid urea ammonium nitrate solutions (28 or 32%) from 2 to 5 days after anthesis has been shown to increase grain protein. In years where expected yields are greater than the grain yield used, a foliar application of N can be used to increase protein. Research has shown that protein can be raised by 0.5 to 1.0% by an application of 30 lbs N per acre. Some leaf burning can be expected but generally will not result in lower yields.

CAUTION – DO NOT TANK MIX 28 OR 32% UAN SOLUTIONS WITH FUNGICIDES

Nitrogen guidelines, whether calculated from the equation or obtained from Table 61, should also be used for winter wheat production. For this crop, 15 to 30 lb. N per acre should be applied in the fall either before or at the time of seeding. The remainder of the amount of fertilizer N needed should be topdressed early in the following spring.

Phosphate Suggestions

Suggestions for phosphate use are summarized in Table 62. The phosphorus (P) status of Minnesota soils is determined by using either the Bray or the Olsen analytical procedure. In general, the Olsen test provides more accurate recommendations if the soil pH is 7.4 or higher.

Potash Suggestions

Suggestions for potash use are summarized in Table 63. As with phosphate, application rates vary with placement and soil test level for K. No broadcast potash will be needed when the soil test for K is 121 ppm or higher. No potash fertilizer (either drilled or broadcast) is suggested when the soil test for K is 161 ppm or higher.

It may not be practical to broadcast some of the low rates of suggested phosphate and potash. When low rates are suggested for a broadcast application, it may be more practical to double the suggested broadcast rate and apply in alternate years if the grain drill is not equipped to apply fertilizer with the seed.

Fertilizer in Contact with the Seed

Since most of the wheat acreage in Minnesota is usually planted in early spring when soil conditions are cold and wet, the application of some fertilizer with the drill should be a routine management practice.

CAUTION! Do not place ammonium thiosulfate (12-0-0-26) in direct contact with the seed. Do not place boron fertilizers in direct contact with the seed.

Damage from urea (46-0-0) placed in contact with the seed is dependent on the moisture content of the soil at planting. Damage can be substantial if soils are dry at planting. If soils are dry at the time of planting, keep the amount of N as urea in contact with the seed to 10 lb. per acre or less. Higher rates can be used if the soil is wet at planting. The suggested rates for this use, however, are not well defined.

High rates of potash in contact with the seed can cause problems if soils are dry at planting. Under typical moisture conditions, rates of K₂O up to 60 lb. per acre in contact with the seed should not cause problems with emergence.

Phosphate has no negative effect on seed germination and seedling growth. Therefore, ample amounts of phosphate can be applied in contact with the seed.

Fertilizer Applied with Air Seeders

The use of air seeders has increased in popularity in recent years. Many seeders are equipped
Other Nutrients Needed

Major emphasis in wheat production should be directed to efficient and effective management of nitrogen, phosphate, and potash fertilizers. Sulfur (S) and copper (Cu) can be important in limited situations. These special cases are described in the paragraphs that follow.

Sulfur

Sulfur fertilization can increase wheat yields when the crop is grown on sandy soils. Research trials have shown that there is no need to add S to a fertilizer program when wheat is grown on fine-textured soils in Minnesota.

The broadcast application of 25 lb. S per acre in the sulfate form will be adequate for growing wheat on sandy soils. For more efficient applications, use 10 to 15 lb. S per acre with the drill at planting.

Copper

Copper (Cu) may be required in a fertilizer program when wheat is grown on organic soils.

Recent trials have shown that rates of phosphate of 92 lb. P2O5 per acre or less have not hindered germination if mixed with wheat seed planted with an air seeder. The amount of K2O that can be applied in contact with the seed using an air seeder is not known at this time.

to apply a mixture of seed and dry fertilizer at the time of planting. There are, however, no firm guidelines for the amount of fertilizer that can be applied with the seed with this planting equipment.

The amount of urea that can be used with the air seeder is related to soil moisture content at planting. Recent trials showed that N rates in excess of 25 lb. per acre as urea can reduce germination if applied with the wheat using an air seeder when soils are dry. By contrast, 75 lb. N per acre as urea caused no emergence problems when soils were moist. Further research is being conducted to determine the amount of N as urea that can safely be mixed with wheat using an air seeder.

Recent trials have shown that rates of phosphate of 92 lb. P2O5 per acre or less have not hindered germination if mixed with wheat seed planted with an air seeder. The amount of K2O that can be applied in contact with the seed using an air seeder is not known at this time.

Table 61. Nitrogen fertilizer guidelines for wheat where the soil NO3-N test is not used:

<table>
<thead>
<tr>
<th>Crop Grown Last Year</th>
<th>Organic Matter Level*</th>
<th>Expected Yield (bu./acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40-49</td>
<td>50-59</td>
</tr>
<tr>
<td>Alfalfa (4+ plants/ft²)</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and High</td>
<td>0</td>
</tr>
<tr>
<td>Alfalfa (2-3 plants/ft²)</td>
<td>Low</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Med and High</td>
<td>0</td>
</tr>
<tr>
<td>Soybeans</td>
<td>Low</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Med and High</td>
<td>40</td>
</tr>
<tr>
<td>Edible beans, field peas</td>
<td>Low</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Med and High</td>
<td>50</td>
</tr>
<tr>
<td>Group 1 Crops</td>
<td>Low</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Med and High</td>
<td>0</td>
</tr>
<tr>
<td>Group 2 Crops</td>
<td>Low</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Med and High</td>
<td>60</td>
</tr>
<tr>
<td>Organic Soils</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Med and High</td>
<td>0</td>
</tr>
</tbody>
</table>

*Low = less than 3.0%; medium and high = 3.0% or more
Suggestions for Cu use are summarized in Table 64.

The suggestions in Table 64 are for organic (peat) soils only. The use of Cu in a fertilizer program is not currently suggested when wheat is grown on mineral soils.

Table 64. Suggestions for use of copper for wheat grown on an organic soil.

<table>
<thead>
<tr>
<th>Copper Soil Test*</th>
<th>Broadcast Copper</th>
<th>Foliar Spray Copper Sulfate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2.5 (Low)</td>
<td>6-12</td>
<td>0.3</td>
</tr>
<tr>
<td>2.6-5.0 (Marginal)</td>
<td>6</td>
<td>0.3</td>
</tr>
<tr>
<td>&gt; 5.0 (Adequate)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Copper is extracted by the DTPA procedure.

Chloride

Research in South Dakota has shown that spring wheat and winter wheat can respond to chloride fertilization. Collection of soil from a depth of 0 to 24 inches is required for a chloride recommendation. The established levels for chloride are listed below.

<table>
<thead>
<tr>
<th>Chloride Soil Test</th>
<th>Relative Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb/acre 2 ft soil test</td>
<td></td>
</tr>
<tr>
<td>0-30</td>
<td>Low</td>
</tr>
<tr>
<td>31-60</td>
<td>Medium</td>
</tr>
<tr>
<td>61 +</td>
<td>High</td>
</tr>
</tbody>
</table>

The chloride guideline is calculated by subtracting the amount of chloride measurement at a depth of 0 to 2 feet from 60. Any chloride should be broadcast and incorporated before seeding. Seed placement of chloride is not superior to broadcast application. Chloride is most economically applied by using muriate of potash (0-0-60).
Other Micronutrients

Research from throughout Minnesota has shown that magnesium, calcium, iron, boron, zinc, and manganese are not needed in fertilizer programs. Most soils are able to supply ample amounts of these nutrients to a high-yielding wheat crop.

WILDLIFE FOOD PLOTS

Soil pH and Liming

Maintaining an optimum soil pH can be critical for the growth and development of many crops. Legumes such as alfalfa and alsike clover require higher soil pH levels than other crops. Liming guidelines are given in Tables 1 and 2. Many soils where food plots are established have a history of forest vegetation. These soils tend to have low soil pH levels. In these cases, a soil test will typically indicate a need for lime application. Since liming a soil requires 2 to 3 tons of material per acre, consideration must be given to determine whether it is feasible to haul and apply lime to areas where food plots are established. Grasses and red clover will typically grow well when soil pH is less than 6.0. Selecting tolerant plant species is critical. Since most crops for wildlife food plots are not grown for maximum yield, liming rates could be reduced or eliminated. If equipment is available for lime application, lime should be applied prior to establishment when it can be incorporated. If lime can be applied, it is suggested that enough should be broadcasted to raise the pH of the soil to 6.0.

<table>
<thead>
<tr>
<th>Buffer Index</th>
<th>ENP</th>
<th>Ag Lime *</th>
<th>ENP</th>
<th>Ag Lime *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb/acre</td>
<td>ton/acre</td>
<td>lb/acre</td>
<td>ton/acre</td>
</tr>
<tr>
<td>6.8</td>
<td>2000</td>
<td>2.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.7</td>
<td>2000</td>
<td>2.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.6</td>
<td>2000</td>
<td>2.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.5</td>
<td>2500</td>
<td>2.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.4</td>
<td>3000</td>
<td>3.0</td>
<td>2000</td>
<td>2.0</td>
</tr>
<tr>
<td>6.3</td>
<td>3500</td>
<td>3.5</td>
<td>2000</td>
<td>2.0</td>
</tr>
<tr>
<td>6.2</td>
<td>4000</td>
<td>4.0</td>
<td>2000</td>
<td>2.0</td>
</tr>
<tr>
<td>6.1</td>
<td>4500</td>
<td>4.5</td>
<td>2000</td>
<td>2.0</td>
</tr>
<tr>
<td>6.0</td>
<td>5000</td>
<td>5.0</td>
<td>2500</td>
<td>2.5</td>
</tr>
</tbody>
</table>

*These are approximate guidelines based on the average ENP value of ag lime. An ENP of 1,000 Lb. per ton is an average value for ag lime (crushed limestone) in Minnesota.

Nitrogen Management

Optimum nitrogen management is critical not only to increase plant growth but also to maintain plant establishment on a year to year basis. Legumes, such as well nodulated alfalfa and clover, can produce enough nitrogen to satisfy the plants requirements. Plants such as grasses do not produce their own nitrogen, so fertilizer nitrogen should be applied under these circumstances. Nitrogen can be applied in a single surface application at or prior to rapid plant growth periods. The full recommended nitrogen rate may not be needed. The amount will depend on the time of planting and amount growth desired from the plants. For late plantings, nitrogen rates can be cut back considerably. A minimum rate of 30 lbs of N is suggested for maintaining stand with a maximum application of no more than 60 lbs of N.

Phosphorus and Potassium

Current phosphate guidelines are listed in Table 66 for separate food plot plant mixtures. Guidelines for potash use are in Table 67. The rates listed are appropriate for broadcast application. Current research on P and K management in food plots is limited. However, if a crop is not
harvested, P and K taken up by the plants will be recycled for the next season’s use and therefore not lost through the removal of crop material. Current guidelines for individual crops consider maximum economic yield. For wildlife food plots, it is suggested that rates be reduced for individual crops since economic yield is not a consideration.

Table 66. Phosphate fertilizer suggestions for wildlife food plots in Minnesota.

<table>
<thead>
<tr>
<th>Crop Mixture</th>
<th>Bray: 0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Olsen: 0-3</td>
<td>4-7</td>
<td>8-11</td>
<td>12-15</td>
<td>16+</td>
</tr>
<tr>
<td></td>
<td>- - - P₂O₅ to apply (lb/acre) - - -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn/Forage Brassicas</td>
<td>25</td>
<td>20</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grass</td>
<td>25</td>
<td>20</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Legume/Grass</td>
<td>35</td>
<td>25</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Oat/wheat/rye</td>
<td>35</td>
<td>25</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Soybean</td>
<td>30</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sugar beet/turnip</td>
<td>35</td>
<td>25</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 67. Potash fertilizer suggestions for wildlife food plots in Minnesota.

<table>
<thead>
<tr>
<th>Crop Mixture</th>
<th>0-40</th>
<th>41-80</th>
<th>81-120</th>
<th>121-160</th>
<th>161+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- - - K₂O to apply (lb/acre) - - -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn/Forage Brassicas</td>
<td>60</td>
<td>40</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grass</td>
<td>40</td>
<td>30</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Legume/Grass</td>
<td>40</td>
<td>30</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Oat/wheat/rye</td>
<td>40</td>
<td>30</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Soybean</td>
<td>60</td>
<td>40</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sugar beet/turnip</td>
<td>40</td>
<td>30</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Secondary and Micronutrients

For most crops grown in wildlife food plots secondary or micronutrients should not be needed for optimal growth. In sandy soils a small amount of sulfur may be needed for legume and grass mixtures. In these cases 10-15 lbs sulfur per acre should be applied with the nitrogen application. Some nitrogen can be substituted with ammonium sulfate (21% N and 24% S) to provide sulfur for the plants. Gypsum can be surface applied to supply needed sulfur however gypsum DOES NOT have a liming effect on the soil.

**WILD RICE**

**Nitrogen**

As with most grains, N management is very important in obtaining high yields. Nitrogen deficiency is a common problem.

Wild rice paddies are very different from upland fields. Nitrate-N build up in groundwater caused by over fertilization is not a problem. Most N losses occur by the process of denitrification that produces N₂, which makes up 78% of the atmosphere. Dry urea, liquid ammonium fertilizers, or anhydrous ammonia are appropriate sources of N. Nitrate fertilizers are ineffective because of denitrification upon flooding.

Basal N is often applied in the fall. To maximize carryover of N to the following spring, application of basal N should be followed by flooding within 2 or 3 days. Fall flooding prevents oxidation of the ammonium forms of N to nitrate and the subsequent losses caused by denitrification when flooding occurs. When fall application is desired, but flooding is not possible, application should be made when soil temperatures are well below 50°F, preferably as close to freezing as possible.

Basal N can also be applied in the spring immediately before flooding. Both spring and fall N should be incorporated to minimize losses by the nitrification/denitrification process in the surface soil that can result in N losses. See Table 68 for N rates.

A minimum of one topdress application of 30 - 40 lb/ac of N as urea, applied by aircraft, is necessary for high yields. A second topdress
is typically needed to maximize yields. A third application may be needed if no basal N was applied or basal N was lost by nitrification followed by denitrification. Drainage of paddy water should not occur for about 5 days after N application.

Field testing in mid June for soil ammonium N can be used to guide topdressing decisions. The SPAD chlorophyll meter or a color chart are also useful aids in determining the timing and number topdress applications.

**Phosphorus**

Phosphorus is an important nutrient for plant growth. In well-fertilized paddies, P accumulates over many seasons and P deficiency is now uncommon.

Phosphorus is the nutrient most limiting for nutrient for algal production in fresh waters, and hence, is of great concern in surface water quality. Phosphorus in paddies can move into surface waters both in the soluble form and as part of soil particles (by soil erosion). When phosphorus is surface applied, it can dissolve in paddy waters causing algal blooms. Incorporation of P fertilizer is very highly recommended and erosion from ditches, etc. should be minimized to prevent phosphorus from entering drainage waters.

Phosphorus can be applied in the fall or spring. It must be incorporated by plow down or injection. The rate of application should be determined by soil testing. When the Bray P 1 test exceeds 16 ppm, do not apply P. See Table 65.

If it is not possible to incorporate P it is best not to add any phosphorus fertilizer. The reserve P in the soil will normally be sufficient for good plant growth.

**Potassium**

Potassium is required by wild rice both for high yield potential as well as helping in protection against some diseases.

Potassium at the levels applied to wild rice paddies is not an environmental concern.

Potassium can be applied in the fall or spring. Usually it is applied with the phosphorus, but, unlike phosphorus, incorporation of K is a necessity. See Table 65 for rates. Application of potassium with the topdress N is possible. This increases the late season uptake of K and might help prevent some diseases.

**Table 68. Guidelines for fertilization of wild rice.**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Criteria</th>
<th>Organic Soils</th>
<th>Mineral Soils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td></td>
<td>25-40</td>
<td>70-100</td>
</tr>
<tr>
<td></td>
<td>Soil Test, Bray P-1 (ppm)</td>
<td>40-50</td>
<td>40-50</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>0-7</td>
<td>40-50</td>
<td>40-50</td>
</tr>
<tr>
<td></td>
<td>8-15</td>
<td>20-30</td>
<td>20-30</td>
</tr>
<tr>
<td></td>
<td>16+</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Soil Test, K (ppm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>0-50</td>
<td>120</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>51-100</td>
<td>90</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>101-150</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>151+</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Water Drainage Before Harvest

Nitrogen in the water can be detected in wild rice fields for 3 to 5 days after fertilization but at drainage time most nutrients in the water have been consumed by the plants. However, to avoid erosion of drainage ditches, the water should be released slowly during a one to two week period before harvest. The soil particles from erosion can carry phosphorus, in addition to any soluble P, into surface waters. Drainage ditches should be stabilized with grasses if possible.
Exhibit 5
The Iowa Nutrient Research and Education Council (INREC) is an organization coordinated by the Agribusiness Association of Iowa. INREC is using farmer survey data collected by ag retailers to help Iowa State University quantify progress toward goals set by the Iowa Nutrient Research Strategy, the state’s main policy instrument for water quality improvement. Part of this effort includes data collection on the amount of nitrogen (N) fertilizer applied to Iowa corn fields. More about this a little bit later.

Corn loves nitrogen. About everybody knows that. However, the amount of grain produced relative to the amount of N applied varies because corn yields also relate to weather, pests, and other management decisions. As the saying goes, sh*t happens. For example, Fig. 1 is a graph I pulled from the Iowa State University agronomy website that plots corn yield (bushels/acre; y-axis) versus N application rate (lbs/acre; x-axis). Each dot is a corn field. If there was a strong relationship, the dots would align in a discernible pattern. If you can see a pattern in that plot and tell me what the optimum amount of nitrogen is based on that data, then you drank some strong tea today.

![Relationship Between Economic Optimum N and Yield](image)

**Fig. 1.** Corn production (bushels per acre) versus amount of N fertilizer, applied (pounds per acre).

Luckily for farmers, there are smart people at Iowa State that can look at that data and tell us what amount of N farmers should use. To that end, they created a great tool that even someone of modest powers like me can navigate. It’s the Nitrogen Rate Calculator and can be found here: [link](#). All you need to do is put in the going price of nitrogen fertilizer, the current or expected price for a bushel of corn, and the calculator grinds out a number.

From here on out, I’m going to walk you through several graphs and all I can do is ask that you hang with me and hope your eyes don’t gloss over. If you don’t have the time or patience to look at the graphs, you can save some time by skipping to the text that begins ***.

As I write this, the cheapest form of N is anhydrous ammonia, selling at $0.38/pound ([link](#)), while going the price for corn is about $4.25. When I put those numbers into the calculator and the select the option of corn grown in a field that had soybeans the previous year, I get the following graph (Fig. 2).
The calculator says that the optimum amount of N that should be applied (MRTN) is 143 pounds per acre. MRTN stands for Maximum Return To Nitrogen. It is not the rate that will necessarily produce the most corn grain, at least not in theory. Corn gradually responds less strongly to increasing amounts of N fertilizer. A point is eventually reached where these diminishing returns make further additions economically counterproductive. This is the MRTN. At the MRTN in the Fig. 2 above, a farmer can expect about 99% of the maximum obtainable return over the long haul.

The calculator also shows what happens when other amounts are applied. I did this in Fig. 3 below for 100 lbs of N. The return drops to 95% of maximum and $12.70 less per acre. This shows you have to increase the N fertilizer rate 43% to get that last 4% of economic return. This still makes sense for the farmer because the return on the investment justifies it.

Fig. 3. Graph comparing the economic return of 100 pounds of nitrogen applied per acre versus 143 pounds per acre.

In the next graph (Fig. 4) I add some water quality data (green line). This comes from a scientific paper (2), mentioned recently in this space, which uses data from test plots in southern Minnesota. It is the Flow Weighted Average nitrate-N concentration in the tiles draining these plots.
Fig. 4. Graph comparing economic return of applied nitrogen (gold) versus tile water nitrate concentrations (green). The gold line corresponds to the y-axis on the left; the green line to the y-axis on the right.

Quite the opposite to corn yields, there are no diminishing returns when it comes to “yield” of N from the tiles. The amount of N discharged to the stream network increases faster than the increase in N fertilizer amounts. At 100 lbs/acre of N fertilizer, the amount of nitrate-N in the tiles is 14.3 ppm. At the recommended rate of 143 lbs/ac (MRTN), it’s 17.8 ppm. At 200 lbs/acre, it’s 26.8 ppm. These absolute values for tile nitrate concentration may change within fields and may be slightly lower or higher for Iowa, but the important part of this is the curvature of the green line relative to that of the gold line. I want to emphasize that none of this is new research and scientists have known these fundamentals for a long time.

***Back to Iowa Nutrient Research and Education Council (INREC). I recently attended a meeting of the Water Resources Coordinating Council. At this meeting, an INREC representative reported that their survey data showed amounts of N applied to corn grown after soybeans averaged 169 pounds per acre, 26 pounds (18%) above the recommended rate (MRTN). Using the graph in Fig. 4, this excess would increase the tile nitrate concentration 24% to 21.3 ppm. My own analysis of federal datasets shows the overall rate of commercial N fertilizer to corn (both corn after corn and corn after soybeans) to be 189 pounds per acre, about 30 pounds more than the MRTN when both rotations are accounted for. And this is before we account for the N excreted by livestock, which is substantial (link, link, link).

So you might ask, why do we use an excess of N fertilizer, especially when we are fully cognizant of the environmental consequences? I think the MRTN graphs illustrate this. On that gold line there are two of what I call “risk zones”, shown below in Fig. 5. To the left of the MRTN, I have circled what I call the “economic risk zone”. The line drops fast, meaning the economic risk for too little N can be severe. The farmer shoulders the burden of this risk (mostly).

Fig. 5. Economic and Environmental “Risk Zones” associated with N application.

To the right of the MRTN is what I will call the “environmental risk zone”. Here the economic risk to the farmer of applying too much is actually quite small. Extra nitrogen is cheap insurance. Spend any amount of time doing what I do, and you will hear that fairly often. The ISU N rate calculator website says as much: “For producers with greater aversion to risk in their corn production system, then N application toward the HIGH end
of the profitable N rate range will more frequently supply N that is at least adequate to meet corn N needs, but have on average greater N input cost and more frequently be above maximum economic response.” As the green line illustrates, however, the environmental risk (green line, poor water quality) increases rapidly as N rates move beyond the MRTN. **The public shoulders the burden for this risk.**

So I’m going to finish this on manure. The map below (Fig. 6) is from an Iowa State document. I added the white numbers. The color of the county indicates the available manure nitrogen relative to that removed in the crops. There are 10 counties where this is greater than 60%, i.e. there is enough manure to provide for 60% of the N fertilization needs. The white numbers are the commercial N rates from my analysis of the federal estimates of commercial fertilizer (1) sold per corn acre. Remember, the ISU recommended for rate for corn after soybeans is 143 pounds per acre. It's pretty clear that availability of manure within a county does not affect sales of commercial N fertilizer very much. **To emphasize, the white numbers are before we add in manure N.**

![Fig. 6. The county's color indicates the available manure N relative to crop needs (%). For example, Lyon County in far northwest Iowa has enough manure to meet nearly 100% of the crop needs. The white number is the amount of N commercial fertilizer being sold in the county per corn acre.](image1)

And the situation is no better with phosphorus, the other major crop nutrient. Figure 7 below shows availability of manure P has almost no bearing on sales of commercial P fertilizer. Some counties have more than enough P, just from the manure, and farmers are still buying P fertilizer at the state average. One caveat here, some P is being applied to soybeans and I would remiss to not mention that.

![Fig. 7. The county's color indicates the available manure P relative to crop needs (%). For example, Lyon County in far northwest Iowa has enough manure to meet nearly 100% of the crop needs. The white number is the amount of P commercial fertilizer being sold in the county per corn acre.](image2)

Some people think I’m against manure as a fertilizer. I am not, if it is used to replace or supplement commercial fertilizer commensurate with crop needs. Right now, that is not the case, and this is a well-established driver of degraded water quality in Iowa. This is low hanging fruit when it comes to improving our water, and it would cost the taxpayer nothing to remedy this. Many people know this.

3 Responses

1. Michael Henning says:
   June 21, 2019 at 10:07 pm
   interesting article. Thank You!
   Reply

2. Don Etler says:
   June 21, 2019 at 10:43 pm
   You did not finish. What is the remedy you say will cost the taxpayer nothing?
   Reply
   • cjones says:
     June 24, 2019 at 9:15 am
     Farmers adhere to the MRTN (recommended) application rates.
     Reply

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Name (required)
Mail (will not be published) (required)
Website

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- CV
- Presentations
- Citizen Scientist Water Monitoring

About this Blog

Water quality is a difficult issue for Iowans. How do we balance the needs of an agricultural economy with the desire for clean water and a healthy environment? Better information is without a doubt the best place to start. I plan to explore the scientific nuances of Iowa's quest for better water quality, with a focus on how we can work together to make progress.

Top Ten Posts

1. Iowa's Real Population
2. 50 Shades of Brown
3. Stop Saying We All Want Clean Water
4. Iowa is Hemorrhaging Nitrogen
5. Cry Me a Raccoon River
6. Don't P down my leg and tell me it's raining
7. This is why we can't have nice things
8. Woke Aldo
9. MMPs are CRAP
10. Ransom

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Exhibit 6
New manure application rate guidelines for Minnesota

September 05, 2019

Credit: MPCA

By: Melissa Wilson, Extension manure

Labels:
Manure management
Nutrient management
management specialist

Manure application rate guidelines in Minnesota have recently been revisited and updated as needed to reflect recent research findings for nitrogen and phosphorus needs of crops.

Check out the updates here:

z.umn.edu/ManureRates

What’s new?

**Nitrogen:** The corn nitrogen guidelines recommended by the University of Minnesota were recently updated for non-irrigated soils. These guidelines use the Maximum Return to Nitrogen (MRTN) approach, which relies on calculating the price ratio for the cost per pound of nitrogen.
divided by the value of corn per bushel. For manure, we suggest using the 0.05 price ratio MRTN as the maximum rate of manure nitrogen that should be applied. This is relevant to those that have manure readily available at a low (or no) cost. For those that pay a premium, the 0.1 price ratio MRTN, or higher, may be more relevant and will result in a lower application rate. Lower application rates may also be considered for economic reasons, environmental concerns, or for fields with lower productivity soils.

More details about fertilizing corn and the various MRTN recommendations can be found here: [z.umn.edu/CornFertilizer](https://z.umn.edu/CornFertilizer)
**Phosphorus:** More and more producers are interested in applying manure in a way that limits the build-up of phosphorus in their soils. One way to do this is to base manure application rates on replacement of phosphorus that will be removed from the soil by the upcoming crop (in the harvested portion). The updated manure application rate guidelines cover the steps to do this.

**Important considerations**

Remember that not all nitrogen or phosphorus in manure is available the first year. Some is “plant-available” right away and some is tied up in the organic matter.
and eventually breaks down to become plant-available. It is important to calculate the first year plant-available nitrogen (PAN) or plant-available phosphorus (PAP) in order to figure out application rates.

Another important step in calculating application rates is to consider all sources of nitrogen to the crop. This includes nitrogen from irrigation water, credits from manure or other organic nitrogen sources that were applied in the past two years, and credits from legumes. Why is that? Because research across the U.S. Midwest has shown that applications of nitrogen above the economically optimum nitrogen rate for a crop significantly
increases nitrogen leaching.

Where can I find more information?

- UMN Manure Land Application
- UMN crop-specific nutrient management needs

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For the latest nutrient management information, subscribe to Minnesota Crop News email alerts, like UMN Extension Nutrient Management on Facebook, follow us on Twitter, and visit our website.

Support for this project was provided in part by the Agricultural Fertilizer Research &
Education Council (AFREC).

SEPTEMBER 05, 2019
MANURE MANAGEMENT, NUTRIENT MANAGEMENT
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Exhibit 7
Manure characteristics

What you need to know

Animal manures are a valuable source of nutrients for crop growth. But, since every farm operation is different, each manure will have unique characteristics. Make regular laboratory manure analysis an important step in your manure and nutrient management planning. Understand that the total nutrient content in manure is not available the first year and that some nutrients may be lost depending on management practices.

Nutrient content

Nutrients in manure are valuable resources, but not all manures are created equal. Manure nutrient content depends on many factors, including:

- Animal species
- Livestock diet
- Livestock housing and bedding
- Manure storage and handling system
- Dilution from water (wash water or rain water)

Since these factors are different on each farm, the most reliable way to determine the nutrient content of manure is to collect a thorough sample and send it to a laboratory for analysis. Some people may use what we call “book values” (averages published by various organizations) to estimate the nutrient content in their manure, but we do not recommend this practice. For an example see Figure 1, which shows the range of nutrient content in select manure types. Small differences between the actual nutrient content of manure and the average “book value” can cause significant over- or under-application of nutrients that may affect crop yields and water quality.

Tips for collecting a thorough manure sample for laboratory analysis

Always use caution and proper safety measures while sampling manure.

Liquid and semi-solid manure
The best and safest time to sample liquid manure is after the pit or lagoon has been agitated and is being pumped out.
- Collect 15 to 25 samples as the pit is pumped out from beginning to end. Dump into a 5-gallon bucket.
- Mix the manure thoroughly.
- Take a subsample, usually about a quart, and place in a plastic container.
- Freeze the sample prior to sending to the lab.

**Note:** This method will not allow you to get the analysis results back prior to application for the current year. However, the analysis can be used to determine whether appropriate amounts of manure were applied to meet crop needs and for estimating the Year 2 and 3 nutrient credits.

### Solid manure
- Manure can be sampled from the stockpile or during hauling.
  - **Stockpile:**
    - Using a pitchfork or shovel, collect 15 to 25 samples from many different depths in the pile but avoid the crust.
  - **During hauling:**
    - Collect several subsamples from each load.
    - Place samples into a 5-gallon bucket and mix very well.
    - Take a subsample and place in a sealable plastic bag, then double up the bag.

**Note:** With the stockpile method, you may be able to have your manure analyzed prior to application. If sampling during hauling, you will not get the analysis results back prior to application for the current year.

### Nutrient availability
Nutrients are not entirely available for crop use the first year after application. This is because nutrients can change forms, and only some of these forms are available for plants to use. When nutrients are bound to carbon they are in an organic form. If not bound to carbon, they are in an inorganic form. Typically, plants can only use the inorganic form of nutrients, but manure supplies both organic and inorganic forms. Microbes can break down organic forms of nutrients and mineralize them into inorganic forms. However, this can take several years and depends on soil moisture and temperature conditions (see Figure 2).
Nitrogen
Nitrogen (N) availability in manure is more challenging to estimate than phosphorus (P) or potassium (K). "Plant Available N" (PAN) is the amount of N available from manure. We can determine this on a yearly basis. "Nitrogen credits" or "N credits" are the second and third year PAN, multiplied by the application rate. Use these N credits when planning fertilizer or manure applications in the second and third year after manure application. Typically, additional N is not released beyond three years.

Raw manure supplies two forms of N to the soil: organic-N and ammonium, an inorganic form. Ammonium is immediately available to plants, while organic-N needs to mineralize into ammonium to be useful. Ammonium can easily convert to ammonia gas in a process called volatilization, and be lost to the atmosphere if not incorporated into the soil. A third form, nitrate is also inorganic and immediately available to plants. It may be present but is usually negligible in raw manures. The overall availability of the combined forms of N depends on two main factors:

- Animal species – different types of animals will have different proportions of organic-N and ammonium in their manure. For example, swine manure has a higher proportion of ammonium while dairy manure has a higher proportion of organic-N.
- Manure application method – injecting liquid manures is the preferred method to minimize ammonia gas losses. When broadcasting either liquid or solid manure, incorporate them as soon as possible to reduce gas losses.

See Table 2 for the percent of total N available per year and how animal type and method of application affects it.

To calculate PAN, multiply the Total N value from the manure analysis by the N availability factor (percent total N available) for each specified year from Table 1 (see Figure 3). To determine N credits for years 2 and 3, calculate the PAN for those years and multiply by the application rate. Remember to account for N credits in those years.
Table 1. Nitrogen availability and loss as affected by method of manure application and animal type

<table>
<thead>
<tr>
<th>Year available</th>
<th>Broadcast + &gt;96 hours incorporation</th>
<th>Broadcast + 12-96 hours incorporation</th>
<th>Broadcast + &lt;12 hours incorporation</th>
<th>Injection: Sweep</th>
<th>Injection: Knife</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>1</td>
<td>25% N available/year</td>
<td>45% N available/year</td>
<td>60% N available/year</td>
<td>60% N available/year</td>
<td>50% N available/year</td>
</tr>
<tr>
<td>2</td>
<td>25% N available/year</td>
<td>25% N available/year</td>
<td>25% N available/year</td>
<td>25% N available/year</td>
<td>25% N available/year</td>
</tr>
<tr>
<td>3</td>
<td>10% N available/year</td>
<td>10% N available/year</td>
<td>10% N available/year</td>
<td>10% N available/year</td>
<td>10% N available/year</td>
</tr>
<tr>
<td>Lost</td>
<td>40% N available/year</td>
<td>20% N available/year</td>
<td>5% N available/year</td>
<td>5% N available/year</td>
<td>10% N available/year</td>
</tr>
<tr>
<td>Dairy</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>1</td>
<td>20% N available/year</td>
<td>40% N available/year</td>
<td>55% N available/year</td>
<td>55% N available/year</td>
<td>50% N available/year</td>
</tr>
<tr>
<td>2</td>
<td>25% N available/year</td>
<td>25% N available/year</td>
<td>25% N available/year</td>
<td>25% N available/year</td>
<td>25% N available/year</td>
</tr>
<tr>
<td>3</td>
<td>15% N available/year</td>
<td>15% N available/year</td>
<td>10% N available/year</td>
<td>15% N available/year</td>
<td>15% N available/year</td>
</tr>
<tr>
<td>Lost</td>
<td>40% N available/year</td>
<td>20% N available/year</td>
<td>10% N available/year</td>
<td>5% N available/year</td>
<td>10% N available/year</td>
</tr>
<tr>
<td>Swine</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
### Phosphorus and potassium

In Minnesota, 80% of the P and 90% of the K in animal manures is available the first year. Find the calculations for the first year "Plant Available P" (PAP) and "Plant Available K" (PAK) in Figure 4.

<table>
<thead>
<tr>
<th>Year available</th>
<th>Broadcast + &gt;96 hours incorporation</th>
<th>Broadcast + 12–96 hours incorporation</th>
<th>Broadcast + &lt;12 hours incorporation</th>
<th>Injection: Sweep</th>
<th>Injection: Knife</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35% N available/year</td>
<td>55% N available/year</td>
<td>75% N available/year</td>
<td>80% N available/year</td>
<td>70% N available/year</td>
</tr>
<tr>
<td>2</td>
<td>15% N available/year</td>
<td>15% N available/year</td>
<td>15% N available/year</td>
<td>15% N available/year</td>
<td>15% N available/year</td>
</tr>
<tr>
<td>3</td>
<td>0% N available/year</td>
<td>0% N available/year</td>
<td>0% N available/year</td>
<td>0% N available/year</td>
<td>0% N available/year</td>
</tr>
<tr>
<td>Lost</td>
<td>50% N available/year</td>
<td>30% N available/year</td>
<td>10% N available/year</td>
<td>5% N available/year</td>
<td>15% N available/year</td>
</tr>
<tr>
<td>Poultry</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>1</td>
<td>45% N available/year</td>
<td>55% N available/year</td>
<td>70% N available/year</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>2</td>
<td>25% N available/year</td>
<td>25% N available/year</td>
<td>25% N available/year</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>3</td>
<td>0% N available/year</td>
<td>0% N available/year</td>
<td>0% N available/year</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Lost</td>
<td>30% N available/year</td>
<td>20% N available/year</td>
<td>5% N available/year</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**Phosphorus and potassium**

In Minnesota, 80% of the P and 90% of the K in animal manures is available the first year. Find the calculations for the first year "Plant Available P" (PAP) and "Plant Available K" (PAK) in Figure 4.

**Figure 4. Calculations for determining plant available phosphorus (PAP) and plant available potassium (PAK).**

\[
PAP = \text{Total P as } P_2O_5 \text{ (from manure analysis)} \times 0.8
\]

\[
PAK = \text{Total K as } K_2O \text{ (from manure analysis)} \times 0.9
\]

Melissa Wilson, Extension manure management specialist

*Reviewed in 2018*
Does the MMP need to be reviewed prior to issuing permits?

NPDES permits should not be issued until the MMP is reviewed and adequate. MMP review prior to issuance of other permits is at the discretion of the CFO/MPCA.

What checklist should I use when reviewing MMPs?

Use the checklist in the guidelines “Manure Management Plan Requirements and Checklist” available at: www.pca.state.mn.us/hot/feedlot-management.html. An electronic version of this checklist with spaces available for writing your comments is available from your regional MPCA staff (on MPCA intranet).

What types of problems need to be corrected before issuing permits?

The MMP can be approved if the most important items are complete. If minor items are missing or inadequate, we should notify the producer or person assisting the producer of the shortcomings, but not necessarily hold up permit issuance. The types of major problems listed below should be corrected before the MMP is approved, since these deficiencies may result in specific violations of land application requirements found in 7020.2225 subparts 2,3,6,7 or 8. These areas are flagged by a ☼ symbol on the checklist in attachment A.

- Manure testing frequency is not described or does not show testing at least once every four years for non-CAFOs and annually for CAFOs;
- Estimated amount of manure generated is much lower in comparison with expected amounts, and past hauling records are not available to substantiate estimated amounts;
- Summer applications and no indication of cover crops;
- Winter application to fields with too many tile intakes to practically achieve the required 300 foot incorporation zone;
- Winter application at CAFOs without meeting all NPDES winter application restrictions;
- Field maps or aerial photos are not attached or the total field acreage is not available;
- Identified acreage is not sufficient to handle the nitrogen from manure (where ownership of manure is not transferred);
- Crop rotations are not described;
- Crop nitrogen needs are not described or deviate substantially from University of Minnesota recommendations;
- Manure is applied two years in a row to non-legumens (i.e. corn or small grains) and nitrogen credits from the previous year are not accounted for;
- Manure rates, combined with fertilizer additions, provide substantially more nitrogen than the crops need or remove.
- The sum of all manure to be applied to individual fields is far less than the expected manure generated at the feedlot;
- Setbacks to sensitive features such as waters, wells, sinkholes, etc. are not described or do not meet minimum requirements in rules;
- Plans or evidence of soil phosphorus testing is not evident;
- Manure is applied in special protection areas at a frequency that will build soil phosphorus levels on soils with...
already more than 21 ppm Bray (e.g. where manure applied over a six year period based upon crop phosphorus removal rate will potentially allow an increase in the soil phosphorus levels);

- Manure is to be applied to soils exceeding 75 ppm Bray near tile intakes, lakes, streams, intermittent streams or wetlands over 10 acres; or exceeding 150 ppm Bray in other areas, and a phosphorus management strategy was not submitted or is inadequate.

What if we miss something during our initial review and later discover a problem?
The producer is required to fix the deficiency upon our request at any time.

Do producers need to follow their MMP?
All producers need to meet manure rate and setback requirements in 7020.2225. Also, MMPs must be updated annually to reflect changes in management. In many cases, the producer can deviate from their plan and still meet the state rule requirements.

The MMP is an enforceable part of NPDES permits. NPDES permitted facilities are required to follow their most recently approved plan in order to be exempt from precipitation induced discharges to waters. NPDES permitted sites will be providing information to the MPCA in annual reports regarding the nature of any changes made to the MMP during the past year. Staff always have the option to ask to see the updated plan.

1. Manure Storage, Handling and Testing

1.1 Manure storage description
(7020.2225 subp. 4, item D(1))

Can the producer just reference the permit application instead of restating the manure storage information in the MMP?
While it is more clear and convenient to have the manure generation and manure application information in the same document (i.e. MMP), we should not require producers to go back and add this into the MMP if sufficient detail is already included in the permit application.

What if they seem to have inadequate storage? New or modified manure storage areas for NPDES facilities need to have 9 months of capacity. All others must have enough storage to apply manure in accordance with their MMP. For example, if they indicate fall months of application, yet they only have 6 months of storage, then the plan should be modified to reflect at least two periods of land application.

1.2 Manure nutrient content
(7020.2225 subp. 4, item D(4) and subp. 2)

Do feedlots with >100 AU need to test every source of manure on the farm?
No. Stockpiles or manure storage areas generated by less than 100 AU are not required to be tested, even where the facility has a total of more than 100 AU. An average book value can be used in these situations. Daily scrape and haul facilities can also use average book values.

Does the producer need to base manure rates on the latest manure test results?
No. The producer may choose to base manure rates on an average from past years or an average of similar farms in the area. While accurate results should be used in the planning process for future years, the MMP reviewer should realize that manure nutrient testing is subject to errors and uncertainties in both sampling and laboratory techniques. Additionally, the lab results are often not returned until after manure is applied.

What if the manure test results seem way high or low?
Manure nutrient content can be highly variable from site to site and can be much higher or lower than average. However, if there is a serious concern you can either ask to see lab results from previous testing to verify the numbers used in the plan, or discuss with the producer what management factors might be causing a more diluted or concentrated manure than other farms.
1.3 Amount of manure generated
(7020.2225 subp. 4, item d(1))

How can I check to see that MMP estimates of manure generation are realistic?
One way is to use the MPCA’s MMP spreadsheet (complete the worksheet entitled “manure storage and handling.”). The program “Nutrient Planner for Minnesota” or the “Manure Management Plan – step by step guide” can also be used. Note that all computer and hand calculations will only provide rough estimates of the generated manure amounts. The best information will be from past hauling and pumping records.

What if estimates of manure N amounts do not account for the manure N that will be available for the second crop after application?
Where legumes (e.g. soybeans, alfalfa or clover) are grown for the first or second crop after manure application, then this second year manure credit does not need to be considered. If the rotations involve corn or small grains following corn or small grains, then the second year manure credit will reduce fertilizer or manure needs (15% of swine manure N and 25% of other manure N will become available for the second crop after application).

1.4 Method of application
(7020.2225 subp. 4, item d(2))

Should we comment to the producer if manure is not going to be incorporated soon after application?
MPCA rules do not prescribe methods of application, except where manure is to be applied within 300 feet of certain waters and tile intakes. You may suggest immediate incorporation and note that surface application without immediate incorporation has been shown to contribute more pollutants to waters and create more nuisance odor.

What if the MMP does not indicate when the manure will be incorporated?
We can not evaluate the nitrogen rates if we do not know whether manure will be incorporated within 12 hrs, 12 to 48 hrs, 2 to 4 days or more than 4 days. All application after four days is treated the same when determining N rates. Also, if applying in special protection areas, the MMP should specify incorporation within 24 hours (except if using the 50-200’ grass buffer option).

What if the MMP does not provide specific information regarding equipment calibration?
At a minimum, the MMP should indicate that manure application equipment will be calibrated. The feedlot owner may not know equipment calibration methods used by hired commercial applicators. You may wish to send a copy of manure calibration procedures to producers who have not included this information in the MMP. One publication is found at www.manure.umn.edu/applied/calibration_of_manure_spreaders/

1.5 Timing of application
(7020.2225 subp. 4, item d(8)(13))

Can manure applications be made in September or early October without a cover crop?
Yes. However, NPDES permitted facilities can not apply to sandy soils until the soil temperature is below 50 degrees F (generally after mid- to late-October). Coarse-textured soils are defined in the NPDES General Permit. If you are unsure about the soil textures at the land application sites, you could remind the producer of the sandy soil requirement in your MMP review notes that you send back to the producer.

When is application during the winter months prohibited? This is answered below under the heading “winter application fields.”

2. Field locations and acreage

2.1 Maps or aerial photos
(7020.2225 subp. 4, item D(3)(10))

Do MMP maps need to show where every sensitive feature is located?
The rules require that the maps show areas not suitable for application. Therefore setbacks should be identified. If manure is injected or incorporated on fields with tile intakes, the tile intake locations do not need to be
mapped since setbacks are not required when the manure is immediately incorporated.

Are soils maps required for the land application sites?
Soils maps are not specifically required by the 7020 rules. They can, however, be a good way to submit the mapped locations of the fields. The advantage of the soil survey maps is that the producer can show slopes and areas of sandy soils. Slopes are needed for winter application sites, and sandy soils have some timing restrictions for NPDES permitted sites.

2.2 Number of acres
(7020.2225 subp. 4, item D(3))

How should I evaluate whether sufficient acreage is available?
Producers will generally need between 0.25 and 1.5 acres per animal unit, depending on the situation. You can use a computer program to better estimate acreage needs (MPCA MMP spreadsheet or Extension/NRCS Nutrient Planner for Minnesota). The computer programs do not give the final answer. Instead, they should be used to determine how closely you need to evaluate the entire MMP to ensure adequate acreage.

What if they do not have enough acreage to match crop phosphorus removal?
The acreage should be enough to handle the manure nitrogen. While we do not require enough acreage to handle all phosphorus at crop removal rates, we should flag situations where P build-up will occur. Producers should be made aware of application practices that could eventually result in problematic phosphorus levels. A note should be put in the file to prompt close review of soil test information in the future.

Do they need to include land application agreement forms for use of neighbors’ land?
7020 rules do not expressly require the use of land application agreement forms. However, the MPCA can ask for land application agreements when needed to evaluate the potential to achieve compliance with nutrient rate requirements. Where the ownership of manure is transferred for application onto neighboring lands, producers are asked to either submit signed land application agreements, or otherwise describe how adequate acreage will be secured. Producers benefit from the signed agreements by having greater assurance that the land will be available in future years.

How do I evaluate acreage needs for transferred ownership of manure?
If ownership of manure is transferred, then the producer does not always need to show the acreage. See “Manure Management Plan requirements for transferred ownership of manure” at www.pca.state.mn.us/hot/feedlot-management

2.3 Winter application fields
(7020.2225 subp. 4, item D(10))

When should a MMP need revisions due to proposed winter application practices?
For non-CAFOs, the MMP must show slopes, runoff prevention practices, and proximity of the field to waters. Encourage the producer to find alternative fields or to avoid winter application where slopes exceed six percent, the fields are within 1000 feet of a lake or stream, reasons for winter application seem questionable, or they do not use important runoff prevention practices such as contour tillage. Pollutant transport during winter months is particularly high on smooth fields (i.e. no-till) or where tillage is up and down slopes. All application to frozen or snow-covered soils in special protection areas is prohibited.

For CAFOs, reject the MMP if winter application onto land owned, rented or under direct control of the feedlot owner will be on slopes exceeding 2% for liquids or 6% for solids, or if tillage will not be on the contour. Also, the plan must be rejected if the field can not achieve a low rating using the Minnesota soil phosphorus index or if excessive BOD in runoff is predicted by an MPCA hydrologist or soil scientist (see MPCA guidelines on winter application at CAFOs). Note that the additional requirements for CAFOs do not apply when ownership of manure is transferred.

2.4 Soil conservation practices (CAFOs)
(40 CFR Part 122.42 (e) (1) (vi))
What if conservation practices seem minimal? 
NPDES-permitted sites must describe the soil conservation practices to be used on fields receiving manure. If it appears that very few conservation practices are in place, then encourage the producer to work with the county soil conservation assistance people. Make a note in the file to look for improved practices during the next MMP review. Since the NPDES permit does not specify conservation standards that must be achieved, we need to allow some flexibility as to how they choose to control runoff.

3. Field specific nutrient management

3.1 Crop rotations (7020.2225 subp. 4, item D(5))

Can the MMP be written for specific crop rotations rather than listing each field individually? 
Yes. This is especially practical in areas where a producer may apply manure onto numerous different fields, each with a small acreage. The locations of each field need to be shown on the maps. Yet, the nutrient management section need only include specific rates of application for each field scenario. A field scenario is a grouping of fields with the same: crop rotation, approximate yield goal, soil organic matter category, and frequency of receiving manure.

For how many years does the plan need to be written for? 
The submitted plan should at least include rates for the upcoming cropping year. The plan must be updated each year to account for changes in crops, and if the MMP does not originally account for the entire rotation.

What if the plan only shows the upcoming crops and no mention is made of other crops in the rotations? 
Both the producer and the MMP reviewer will need to understand whether legumes (e.g. alfalfa, soybeans or clover) are planted the year before corn or grains. Legumes will reduce the needed nitrogen during the following year and can also affect the total acreage needs.

3.2 Crop nutrient needs from manure (7020.2225 subp. 4, item D(5) and subp. 3)

What if listed crop nitrogen (N) needs seem too high? 
If crop N needs appear excessive, check the nitrogen needs using the MPCA MMP spreadsheet or University tables. In addition to University of Minnesota table recommendations, producers can base crop N needs on soil test results or recommendations from a neighboring state.

What if the yield goals seem out of line? 
You may choose to comment on yield goal assumptions if they seem highly exaggerated. Indicate that Minnesota recommends that expected yield goals should be determined by taking an average of the top four yields during the past five years of growing that crop. Note that many farmers are actually able to achieve a much higher yield than county averages.

Does the soil need to be tested to determine crop nitrogen needs? 
Typically not. Soil nitrate testing is particularly useful if manure was applied during the previous summer and the upcoming crop is corn. In many situations the University of Minnesota does not promote use of the soil nitrate test. For more information go to: www.manure.umn.edu/applied/soil_testing

How specific do the nutrient needs part of the MMP need to be when the feedlot has not yet been constructed? 
For new construction, some uncertainty will exist regarding manure nutrient levels and manure amounts. The fields and general nature of the crop rotations should be known. Less accurate information about crop nutrient needs and rates of application are expected in the initial plan. However, once the feedlot is up and running and manure has been generated and tested over a year, then the MMP should be revised to reflect more accurate nutrient management information.

3.3 Planned rates of manure application (ch. 7020.2225 subp. 4, item D(5) and subp. 3)

Does each field need to have a separate calculated rate of application? See response to question in section 3.1.
What are excessive rates of application?
As a rule of thumb, you may wish to comment back to the producer when rates (manure plus fertilizer) will result in 20 percent or more nitrogen than the University Extension Service says is needed or removed by the crop. Crop N needs and associated manure rates can be determined using the MPCA MMP spreadsheet, or an Extension Service spreadsheet found at: www.manure.umn.edu/applied/calculating_manure_app_rates/. Note: producers may have legitimate reasons for the increased rates due to many variables.

Are there any situations where the annual rate of application must be limited to crop phosphorus (P) needs?
When P restrictions apply (i.e. >21 ppm Bray in SPAs, >75 ppm near tile intakes, >150 ppm in other areas), producers can apply manure during any single year based on crop nitrogen needs, and then avoid manure applications to that field during the subsequent years until the crops remove the applied P. The only situation where single year applications need to match crop P removal is NPDES permitted sites which are surface applying (without incorporation) onto soils with extremely high P levels.

3.4 Available nutrients from applied manure
(ch. 7020.2225 subp. 4, item D(7) and subp. 3)

What if the total planned manure applications are less than the manure that is generated?
• If the sum of manure applications is well short of expected manure generation, the producer may have to find additional acreage or make other changes to the manure management plan. The producer could also sell some of the manure to others.

3.5 Total nutrients available to crops from all sources (ch. 7020.2225 subp. 4, item D(6))

What should I do if the MMP does not include commercial fertilizer amounts to be applied onto fields receiving manure?
The MMP must include nutrient additions from all sources (at least for fields receiving manure). Often a starter fertilizer is used in addition to the manure rates. You may wish to verify with the producer that no commercial fertilizer will be applied.

3.6 Nitrogen carry-over into following year (ch. 7020.2225 subp. 4, item D(7) and subp. 3)

What if the producer makes no mention about 2nd year nitrogen from manure applications? See response to a related question in section 1.3

4. Sensitive Areas Management
See local requirements, feedlot permit conditions, and the publication “Applying Manure in Sensitive Areas”

4.1 Special protection areas
(ch. 7020.2225 subp. 4, item D(9) and subps. 6 and 7)

What types of wetlands need setbacks? Only those wetlands that are considered public waters wetlands have specific minimum setbacks in 7020 rules. These wetlands are typically over 10 acres in rural areas and are shown on maps at: www.dnr.state.mn.us/waters/watermgmt_section/pwi

BMPs for protecting smaller wetlands need to be described in the MMP, but minimum requirements have not been established for the smaller wetlands.

Are immediate incorporation zones required around rock inlets, blind inlets and other alternatives to tile intakes?
Where research shows that equivalent or better water quality protection is achieved by alternatives to setbacks and incorporation zones established in 7020 rules, the MPCA can approve such alternatives. To date, the MPCA requires the 300 foot immediate incorporation zone around all tile inlets, rock inlets and blind inlets.

What if the MMP is missing the practices for sensitive features?
Producers can use an MPCA guideline entitled “Manure Management Plan – Sensitive Area Guidelines” found at: www.pca.state.mn.us/hot/feedlot-management
4.2 High phosphorus soils
(ch. 7020.2225 subp. 4, item D(11) and subp. 3, item C)

Do soil phosphorus test results need to be submitted along with the MMP?
The MPCA is asking that the soil P results be submitted with the MMP, except that results are not needed for transferred manure ownership or when testing is not feasible for new construction (e.g. winter). Producer records will suffice (i.e. lab sheets are not typically needed). Each region can determine priorities for follow-up when test results are missing. It is more important to review soil P results in situations where soil P is likely to build, such as annual applications, non-calcareous soils, high manure P content such as poultry manure, past problems at that farm, etc..

Can producers continue to apply manure onto soils with extremely high soil test phosphorus?

See page 8 of publication “applying manure in sensitive areas” or see “Manure Management Plan – Sensitive Area Guidelines” found at: www.pca.state.mn.us/hot/feedlot-management.

Also, see MPCA MMP spreadsheet (phosphorus management worksheet) to check on frequency of application needed to prevent long term phosphorus build-up and to understand options for extremely high P soils. Consult the NPDES permit for CAFO requirements, which are more specific when dealing with extremely high P soils.

In general, feedlots over 300 AU will either need to follow NRCS 590 standards or achieve a low rating with the Minnesota Phosphorus index in order to continue limited manure applications onto soils with extremely high soil P levels.
Manure Management Plan Checklist

A manure management plan that meets Minn. Rules ch. 7020 requirements will include the items below. Where feedlot owners transfer manure ownership for application to fields that are not owned or leased by the feedlot owner, see MMP guidelines for transferred manure ownership.

1. Manure Storage, Handling and Testing

1.1 Manure storage description
(7020.2225 subp. 4, item D(1))
☐ Type of storage areas are described.
☐ Storage capacity and number of months of storage.
☐ Type and number of animals contributing to each storage area are included.

1.2 Manure nutrient content
(7020.2225 subp. 4, item D(4) and subp. 2)
☐ ☉Testing frequency shows testing at least once every four years and once per year for the first three years (annually for NPDES permits).
☐ Sampling procedures and protocol are described.
☐ Estimated nutrient content of manure(s) is listed and is based on past laboratory test results (or average book values for new facilities).

1.3 Amount of manure generated
(7020.2225 subp. 4, item d(1))
☐ ☉Tons of solid manure and gallons of liquid manure to be land-applied from each storage area per year are listed (based on records of past few yrs).
☐ Annual amount of nitrogen available from all manure storage areas is listed (based on records of amount hauled in past years times the manure nutrient content).
☐ Annual amount of phosphorus available from all manure storage areas is listed.

1.4 Method of application
(7020.2225 subp. 4, item d(2))
☐ Method of application, including number of days between application and incorporation.
☐ Equipment calibration practices (if not using a certified commercial applicator).

1.5 Timing of application
(7020.2225 SUBP. 4, ITEM D(8)(13))
☐ Expected months of application are listed.
☐ ☉For June, July or August applications, type of cover crop to be planted to harvested fields without actively growing crops is described.
☐ NPDES permits: manure is applied to sandy soils during spring or mid-to late fall (soils less than 50 )

2. Field Locations And Acreage

2.2 Maps or aerial photos
(7020.2225 subp. 4, item D(3)(10))
☐ ☉Fields are shown on maps or aerial photos.
☐ Maps or aerial photos highlight planned setbacks.
☐ Winter application fields are identified on map(s).

2.2 Number of acres
(7020.2225 subp. 4, item D(3))
☐ ☉Total number of acres for application is identified.
☐ Acreage excludes land not suitable for application (due to setbacks, wetlands, etc.).
☐ ☉Identified acreage is sufficient to handle manure nitrogen.
☐ Identified acreage is sufficient to receive manure phosphorus (P) without extreme soil P build-up over time.

2.5 Winter application fields
(7020.2225 subp. 4, item D(10))
☐ ☉Field locations for winter application are generally those farthest from waters and no applications will occur within 300 feet of waters or tile intakes (i.e. special protection areas).
☐ Slopes for winter application sites are listed in the plan and generally are the flattest land available.
☐ Conservation practices (e.g. contour tillage) are described for winter application sites.
☐ ☉NPDES permits: winter application criteria are met, as required in permit, including 2% slope restrictions for liquid and 6% for solid manure.
☐ ☉NPDES permits: Specific information is provided that allows MPCA to conduct winter spreading site evaluations.
2.6 Soil conservation practices (CAFOs)
(40 CFR Part 122.42 (c) (1) (vi))
- NPDES permits: Soil conservation practices are described.

3. Field Specific Nutrient Management

3.1 Crop rotations
(7020.2225 subp. 4, item D(5))
- Crop rotations are described and indicate which crops in the rotation will receive manure.

3.2 Crop nutrient needs from manure
(7020.2225 subp. 4, item D(5) and subp. 3)
- Nitrogen (N) needs for non-legumes and N removal for legumes are described for fields receiving manure.
- Range of expected crop yields are listed and realistic.
- Crop N needs account for previous year legume N credits.
- Crop N needs account for N credits from alfalfa or red clover grown two years ago.
- Crop N needs are generally consistent with recommendations from the Univ. of Minnesota or from another University in IA, WI, ND, or SD.
- Plans for soil nitrate testing are described, where recommended by the University of Minnesota.
- N credits from the previous year manure applications are accounted for (i.e. continuous corn).
- Crop phosphorus (P) needs are identified and based on soil phosphorus test results.

3.4 Planned rates of manure application
(ch. 7020.2225 subp. 4, item D(5) and subp. 3)
- Manure rates specific for each field or cropping situation are described.
- Rates are consistent with crop nutrient needs and expected manure nutrient content/availability.

3.4 Available nutrients from applied manure
(ch. 7020.2225 subp. 4, item D(7) and subp. 3)
- Amount of N and P available to the first crop following manure application are described (lbs/acre).
- The sum of all manure applied to individual fields approximately equals the expected amount of manure generated at the feedlot.

3.5 Total nutrients available to crops from all sources
(ch. 7020.2225 subp. 4, item D(6))
- Total N amounts per acre available to each crop are described (manure N + fertilizer N + other N).
- Added commercial fertilizer N does not result in total N additions that are above crop N needs.
- Total P amounts per acre are listed and include fertilizer P.

3.6 Nitrogen carry-over into following year (ch. 7020.2225 subp. 4, item D(7) and subp. 3)
- Manure and/or fertilizer additions during the year following manure application are reduced to account for second year N credits. The amount of carry-over N is incorporated into the plan.

4. Sensitive Areas Management
See local requirements, feedlot permit conditions, and the publication “Applying Manure in Sensitive Areas.”

4.1 Special protection areas
(ch. 7020.2225 subp. 4, item D(9) and subp. 6)
- Protective measures are described when applying manure within 300 feet of:
  - Lakes;
  - DNR protected wetlands (i.e. over 10 acres)
  - Streams and intermittent streams; and
  - Drainage ditches without protective berms.
- All protective measures for the above areas meet state and county requirements, and otherwise provide sufficient protection of waters.

4.2 Other avenues to surface water
(ch. 7020.2225 subp. 4, item D(9) and subp. 7)
- Protective measures are described when applying:
  - In flood plains;
  - Within 300 feet of surface tile intakes, including, at a minimum, injection or incorporation within 24 hours; and
  - Within 300 feet of non-protected wetlands (e.g. less than 10 acres).
- All protective measures for the above areas meet state and county requirements, and otherwise provide sufficient protection of waters.
4.3 **Ground water protection**  
(ch. 7020.2225 subp. 4, item D(9))

**Protective measures are described when applying:**

- In a vulnerable drinking water supply mgmt area;
- Within 300 feet of sinkholes; and
- On land with less than three feet of soil above bedrock.
- ☀ All protective measures for the above features meet state and county requirements, and otherwise provide sufficient protection of waters.

4.4 **High phosphorus soils**  
(ch. 7020.2225 subp. 4, item D(11) and subp. 3, item C – requirements if over 300 AU)

- ☀ Soils are tested for P at least once every 4 yrs and results submitted, where required in past.
- ☀ Soil P is managed in special protection areas to prevent increasing P levels over any six-year period (where soil P levels are already high enough for crop needs and a 50-100’ buffer has not been established).
- ☀ Manure application is avoided on soils exceeding 150 ppm Bray or 120 ppm Olsen in areas outside of special protection areas, or to soils exceeding 75 ppm Bray or 60 ppm Olsen in special protection areas (if not avoided, the plan includes a strategy to protect water quality, e.g. meet all NRCS standards for high P soils and prevent continued soil phosphorus build-up).
Exhibit 9
This booklet is prepared by the Minnesota Pollution Control Agency.

The data contained within the booklet is current as of January 1, 2012.

For questions on how to use this booklet, to report errors within the booklet, or to offer suggestions for future printings, please contact your regional Minnesota Pollution Control Agency office.

**Minnesota Pollution Control Agency Regional Offices**

- Brainerd ...................... (218) 828-2492
- Detroit Lakes ............... (218) 847-1519
- Mankato ..................... (507) 389-5977
- Marshall ..................... (507) 537-7146
- Rochester .................... (507) 285-7343
- St. Paul ....................... (651) 296-6300
- Willmar ...................... (320) 214-3786

wq-f6-26 Updated July 2012
Manage Manure Applications to Protect Water Quality and Save Money

Protect Your Water:
- Protect your well water and nearby surface water by using the correct application rate and observing application setbacks
- Meet state rules and regulations designed to protect water quality

Cut Your Costs:
- Potentially save $10 - $40 per acre in N fertilizer costs by using the correct application rate (based on 20 tons/acre of solid manure)
- You can double N fertilizer savings by immediately incorporating your manure
This graphic summarizes the State setback requirements. County and/or Township requirements may be more restrictive.
# How to Use This Booklet

This booklet is designed to assist anyone applying manure in determining a rate that meets the nitrogen needs of the crop(s) grown. This booklet should not be used as a substitute for a Manure Management Plan (MMP), but is useful for facilities where a MMP is not required or for those applying manure from facilities where a MMP is not required.

To determine the application rate, first locate the correct chart using the animal and manure type and the method of incorporation at the top of each chart.

Then, identify the manure nitrogen test value in lbs/1000gal or lbs/ton in the far left column. Next, locate the desired amount of nitrogen you want to be available to the crop(s) grown in the top row of the chart.

Where these two values intersect on the chart is the desired application rate in either 1,000’s of gallons per acre or tons per acre.

It is important to note that, due to rounding, applied nitrogen rates may be slightly higher or lower than the values shown in the chart.

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## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction and Instructions</td>
<td>....................... 1-2</td>
<td></td>
</tr>
<tr>
<td>Estimated Nutrient Content of Manure</td>
<td>............... 3</td>
<td></td>
</tr>
<tr>
<td>Nitrogen Availability and Losses</td>
<td>..................... 4</td>
<td></td>
</tr>
<tr>
<td>Nitrogen Needs and Removal of Crops</td>
<td>............... 5</td>
<td></td>
</tr>
<tr>
<td><strong>Section A - SWINE</strong></td>
<td></td>
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</tr>
<tr>
<td>Manure Application Rates for Liquids</td>
<td>..... 6-10</td>
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</tr>
<tr>
<td>Manure Application Rates for Solids</td>
<td>...... 11-13</td>
<td></td>
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<tr>
<td><strong>Section B - DAIRY</strong></td>
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<td>Manure Application Rates for Liquids</td>
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<tr>
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<td><strong>Section C - BEEF</strong></td>
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<td><strong>Section D - POULTRY</strong></td>
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<td>Manure Application Rates for Liquids</td>
<td>.... 30-34</td>
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<td>Manure Application Rates for Solids</td>
<td>...... 35-37</td>
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</tr>
<tr>
<td>Manure Application Setbacks</td>
<td>....................... 38</td>
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</tr>
<tr>
<td>Manure Stockpile Requirements</td>
<td>....................... 39</td>
<td></td>
</tr>
<tr>
<td>Phosphorus Application Requirements</td>
<td>........... 40</td>
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</tr>
<tr>
<td>Phosphorus Removal by Crops</td>
<td>....................... 41</td>
<td></td>
</tr>
<tr>
<td>Manure Spreader Calibration</td>
<td>....................... 42</td>
<td></td>
</tr>
<tr>
<td>How to Take a Manure Sample</td>
<td>....................... 43</td>
<td></td>
</tr>
<tr>
<td>Record Keeping Requirements</td>
<td>....................... 44</td>
<td></td>
</tr>
<tr>
<td>Manure Spill Response</td>
<td>....................... 45</td>
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EXAMPLE

Sweep injected liquid swine manure with a nitrogen test value of 52 lbs/1,000 gal. To obtain 180 lbs of available nitrogen the application rate would be 4,500 gal/acre.

<table>
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<th>Incorporation: Sweep Injection</th>
<th>% Avail: 80%</th>
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<td><strong>Table: Manure Application Rate (1,000 gal/acre)</strong></td>
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<td><strong>Manure N Test</strong></td>
<td><strong>60</strong></td>
<td><strong>80</strong></td>
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<tr>
<td>20</td>
<td>4.0</td>
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# Estimated Nutrient Content of Liquid and Solid Manure*

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<th>Animal Type</th>
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<th>Solid Manure (lbs/ton)</th>
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<tr>
<td></td>
<td>N</td>
<td>P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
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<tr>
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<td>P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
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<tr>
<td><strong>Beef</strong></td>
<td></td>
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<tr>
<td>Feeder Cattle/Slaughter Steer</td>
<td>29</td>
<td>18</td>
</tr>
<tr>
<td>Cow</td>
<td>20</td>
<td>16</td>
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<tr>
<td>Calf</td>
<td>27</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>7</td>
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<tr>
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<td>4</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>4</td>
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<tr>
<td><strong>Dairy</strong></td>
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<td>Milk Cow</td>
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<tr>
<td>Layers</td>
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<tr>
<td>Broilers</td>
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<td>Turkey - Hen</td>
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<tr>
<td></td>
<td>40</td>
<td>50</td>
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</table>

* When possible actual manure test results should be used in place of these estimates

# Nitrogen Availability and Loss, as Affected by Method of Manure Application and Animal Species

<table>
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<tr>
<th>Year Available</th>
<th>% of Total Nitrogen Available Per Year</th>
<th>Injection</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Broadcast Incorporation Timing</td>
<td>Sweep</td>
</tr>
<tr>
<td></td>
<td>After 96 hrs.</td>
<td>12 to 96 hrs.</td>
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<tr>
<td><strong>Beef</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>25</td>
<td>45</td>
</tr>
<tr>
<td>Year 2</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Lost</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td><strong>Dairy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Year 2</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Lost</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td><strong>Swine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>35</td>
<td>55</td>
</tr>
<tr>
<td>Year 2</td>
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<td>15</td>
</tr>
<tr>
<td>Lost</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td><strong>Poultry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>45</td>
<td>55</td>
</tr>
<tr>
<td>Year 2</td>
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<td>25</td>
</tr>
<tr>
<td>Lost</td>
<td>30</td>
<td>20</td>
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<tr>
<td>Crop</td>
<td>Yield</td>
<td>Crop Last Year</td>
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<tr>
<td>-----------------</td>
<td>-------</td>
<td>----------------</td>
</tr>
<tr>
<td>Corn</td>
<td>Any</td>
<td>Corn</td>
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<tr>
<td>Corn</td>
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<tr>
<td>Corn</td>
<td>Any</td>
<td>Soybeans</td>
</tr>
<tr>
<td>Corn</td>
<td>Any</td>
<td>Alfalfa</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>Any</td>
<td>Corn</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>Any</td>
<td>Corn</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>Any</td>
<td>Alfalfa</td>
</tr>
<tr>
<td>Wheat</td>
<td>60 - 69 bu</td>
<td>Corn</td>
</tr>
<tr>
<td>Wheat</td>
<td>60 - 69 bu</td>
<td>Soybeans</td>
</tr>
<tr>
<td>Oats</td>
<td>81 - 100 bu</td>
<td>Corn</td>
</tr>
<tr>
<td>Oats</td>
<td>81 - 100 bu</td>
<td>Soybeans</td>
</tr>
<tr>
<td>Sweet Corn</td>
<td>8 - 9 ton</td>
<td>Corn</td>
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<tr>
<td>Sweet Corn</td>
<td>8 - 9 ton</td>
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</tr>
<tr>
<td>Soybeans</td>
<td>50 bu</td>
<td>Any</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>5 ton</td>
<td>Any</td>
</tr>
<tr>
<td>Grass/Legume</td>
<td>4 ton</td>
<td>Any</td>
</tr>
</tbody>
</table>

* The nitrogen needs values, in this chart, represent the upper-end of typical crop nitrogen needs and may not be the best nitrogen recommendation for every case. To obtain specific nitrogen recommendations please refer to the applicable University of Minnesota publication(s).
Manure Type: Swine Liquids  
Incorp: After 4 days  
% Avail: 35%

<table>
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<tr>
<th>Manure N Test</th>
<th>Desired Available N (lbs/acre)</th>
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<tbody>
<tr>
<td>60</td>
<td>21.5 28.5 35.5 43.0 46.5 50.0 53.5 57.0 60.5 64.5 71.5</td>
</tr>
<tr>
<td>8</td>
<td>14.5 19.0 24.0 28.5 31.0 33.5 35.5 38.0 40.5 43.0 47.5</td>
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<tr>
<td>12</td>
<td>10.5 14.5 18.0 21.5 23.0 25.0 27.0 28.5 30.5 32.0 35.5</td>
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<td>16</td>
<td>8.5 11.5 14.5 17.0 18.5 20.0 21.5 23.0 24.5 25.5 28.5</td>
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<td>7.0 9.5 12.0 14.5 15.5 16.5 18.0 19.0 20.0 21.5 24.0</td>
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<td>6.0 8.0 10.0 12.0 13.5 14.5 15.5 16.5 17.5 18.5 20.5</td>
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<td>5.5 7.0 9.0 10.5 11.5 12.5 13.5 14.5 15.0 16.0 18.0</td>
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<td>5.0 6.5 8.0 9.5 10.5 11.0 12.0 12.5 13.5 14.5 16.0</td>
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**Incorp:** 12 – 96 hours  
**% Avail:** 55%

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Manure Type: Swine Liquids  Incorp: Within 12 hours  % Avail: 75%

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**Incorp:** Sweep Injection  
**% Avail:** 80%

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Incorp: Knife Injection  
% Avail: 70%

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**Incorp:** After 4 Days  
**% Avail:** 35%

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**Manure Type:** Swine Solids  
**Incorp:** 12-96 hours  
**% Avail:** 55%

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**Incorp:** Within 12 hours  
**% Avail:** 75%

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**Incorp:** Within 12 hours  
**% Avail:** 55%

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Manure Type: Dairy Solids  Incorp: After 4 days  % Avail: 20%

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### Manure Type: Dairy Solids

**Incorp:** 12 - 96 hours  
**% Avail:** 40%

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Manure Type: Dairy Solids  Incorp: Within 12 hours  % Avail: 55%

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**Incorp:** 12 - 96 hours  
**% Avail:** 45%

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Manure Type: Beef Solids  Incorp: After 4 days  % Avail: 25%

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Manure Type: Beef Solids

Incorp: 12 - 96 hours  % Avail: 45%

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**Manure Type:** Beef Solids  
**Incorp:** Within 12 hours  
**% Avail:** 60%

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**Manure Type:** Poultry Liquids  **Incorp:** After 4 days  **% Avail:** 45%

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Manure Type: Poultry Liquids  Incorp: 12 - 96 hours  % Avail: 55%

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**Incorp:** After 4 days  
**% Avail:** 45%

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**Manure Type:** Poultry Solids  
**Incorp:** Within 12 hours  
**% Avail:** 70%
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<th>No Incorporation or Incorporation after 24 hrs</th>
<th>Injection or Incorporation within 24 hrs</th>
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<td>Protected Wetlands (10+ acres)</td>
<td>300 ft&lt;sup&gt;c&lt;/sup&gt;</td>
<td>25 ft&lt;sup&gt;d&lt;/sup&gt;</td>
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<td>Drainage Ditches (no berms)</td>
<td>300 ft&lt;sup&gt;c&lt;/sup&gt;</td>
<td>25 ft&lt;sup&gt;d&lt;/sup&gt;</td>
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<td>Sinkhole (no berms/diversions)</td>
<td>300 ft up / 50 ft down</td>
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<td>Mine, Quarry, or Gravel Pit</td>
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<td>Open Tile Intakes (including rock/blind inlets)</td>
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<td>Road Ditches</td>
<td>No application directly into the road ditch</td>
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<td>Permit may be needed – No soil-P buildup at some sites</td>
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<td>DWSMA/Wellhead Protection</td>
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<td>Frequently Flooded Soils</td>
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<sup>a</sup> County and/or NPDES permit requirements may be more restrictive

<sup>b</sup> 100 ft non-manured vegetated buffer can be used instead of the 300 ft setback (non-winter)

<sup>c</sup> 50 ft non-manured vegetated buffer can be used instead of the 300 ft setback (non-winter)

<sup>d</sup> Where soil phosphorus exceeds 21 ppm Bray or 16 ppm Olsen, phosphorus must be managed to prevent buildup over a 6 year period.
# Short-Term Manure Stockpile Requirements

## Location Restrictions

<table>
<thead>
<tr>
<th>Feature</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waters of the State, Tile Intakes, Road Ditches, Sinkholes, Non-Farmed Wetlands, and Rock Outcroppings</td>
<td>Setback of 300 ft of flow distance and at least 50 ft horizontal distance</td>
</tr>
<tr>
<td>Private well</td>
<td>Setback of 100 ft*</td>
</tr>
<tr>
<td>Public Water Supply Well</td>
<td>Setback of 1,000 ft</td>
</tr>
<tr>
<td>Shoreland or Floodplain</td>
<td>Stockpiling is prohibited</td>
</tr>
<tr>
<td>Land with greater than a 6% slope</td>
<td>Stockpiling is prohibited</td>
</tr>
<tr>
<td>Land with greater than 2 % slope and no clean water diversions and erosion control measures</td>
<td>Stockpiling is prohibited</td>
</tr>
<tr>
<td>Land where soil texture to a depth of five feet, except the plow layer, is entirely coarser than a sandy-loam</td>
<td>Stockpiling is prohibited</td>
</tr>
<tr>
<td>Sand/Gravel Pits, Quarries, On Bedrock</td>
<td>Stockpiling is prohibited</td>
</tr>
<tr>
<td>Drain Tile with less than 3 ft of soil cover</td>
<td>Setback of 100 ft</td>
</tr>
</tbody>
</table>

* Setback increases to 200 ft if the well has less than 50 ft of watertight casing and is not cased through a confining layer at least 10 ft thick

## Other Restrictions

- Each stockpile must not exceed agronomic needs of the crops on 320 acres
- Maintain 2 ft separation from the base of the stockpile to the seasonal high water table
- Stockpile must be removed within one year (otherwise considered a permanent stockpile)
- Must have vegetated cover or cropping history for at least one full growing season prior to re-use of the stockpiling site
  - Exemption: If stockpiled for less than 10 consecutive days and no more than 6 times per year, or within open lots with less than 100 animal units.
# Minimum State Soil Phosphorus Requirements

<table>
<thead>
<tr>
<th>Bray P1 (ppm)</th>
<th>&lt; 22</th>
<th>22-75</th>
<th>76-150</th>
<th>&gt; 150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olsen (ppm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 17</td>
<td>No Phosphorus management requirements</td>
<td>No Phosphorus management requirements</td>
<td>No Phosphorus management requirements</td>
<td>Permit required if over 300 AU</td>
</tr>
<tr>
<td>17-60</td>
<td>Prevent long-term build-up of Soil P</td>
<td>Prevent long-term build-up of Soil P</td>
<td>Prevent long-term build-up of Soil P</td>
<td>Prevent long-term build-up of Soil P</td>
</tr>
<tr>
<td>61-120</td>
<td>Permit required if over 300 AU</td>
<td>Permit required if over 300 AU</td>
<td>Permit required if over 300 AU</td>
<td>Permit required if over 300 AU</td>
</tr>
</tbody>
</table>

**More than 300 ft from waters**

**Less than 300 ft from waters**

---

*a* Lakes, rivers, streams, intermittent streams, protected wetlands, or unbermed drainage ditches. Also includes tile intakes when soil P levels are above 75 Bray (60 Olsen) or at a CAFO or NPDES permitted site above 21 Bray (16 Olsen).

*b* The rate and frequency of manure applications must not allow soil phosphorus build-up over a six year period. Single year applications can be based on crop nitrogen needs if remaining phosphorus is removed by subsequent crops. This typically results in manure applications only 1 - 3 times in a six year period (see next page for more information).

*c* Only if over 300 AU. MMP must describe how phosphorus will be managed to prevent phosphorus transport (diet manipulation, soil conservation, fewer applications, etc.).

*d* If soil test are in lbs/acre divide by 2 for approximate levels in ppm. If the Mehlich III test is used, the values in the table columns are approximately <30, 31-90, 91-180, >180.

*e* Restrictions do not apply if a 100 ft non-manured vegetative buffer along lakes and streams, or a 50 ft non-manured vegetative buffer along intermittent streams, protected wetlands, and unbermed drainage ditches is maintained.
### Phosphorus Removal by Various Crops

<table>
<thead>
<tr>
<th>Crop</th>
<th>( \text{P}_2\text{O}_5 ) Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>10.8 lbs/ton</td>
</tr>
<tr>
<td>Barley (grain)</td>
<td>0.41 lbs/bu</td>
</tr>
<tr>
<td>Barley (grain &amp; straw)</td>
<td>0.55 lbs/bu</td>
</tr>
<tr>
<td>Clover</td>
<td>10.7 lbs/ton</td>
</tr>
<tr>
<td>Corn (grain)</td>
<td>0.34 lbs/bu</td>
</tr>
<tr>
<td>Corn silage</td>
<td>3.8 lbs/ton</td>
</tr>
<tr>
<td>Edible beans</td>
<td>0.01 lbs/lb</td>
</tr>
<tr>
<td>Grass hay or pasture</td>
<td>8.9 lbs/ton</td>
</tr>
<tr>
<td>Grass/legume</td>
<td>11.2 lbs/ton</td>
</tr>
<tr>
<td>Oats (grain)</td>
<td>0.25 lbs/bu</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crop</th>
<th>( \text{P}_2\text{O}_5 ) Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oats (grain &amp; straw)</td>
<td>0.32 lbs/bu</td>
</tr>
<tr>
<td>Peas</td>
<td>0.01 lbs/lb</td>
</tr>
<tr>
<td>Potatoes</td>
<td>0.14 lbs/cwt</td>
</tr>
<tr>
<td>Rye (grain)</td>
<td>0.44 lbs/bu</td>
</tr>
<tr>
<td>Rye (grain &amp; straw)</td>
<td>0.59 lbs/bu</td>
</tr>
<tr>
<td>Soybeans</td>
<td>0.82 lbs/bu</td>
</tr>
<tr>
<td>Sugar beets</td>
<td>0.961 lbs/ton</td>
</tr>
<tr>
<td>Sweet corn</td>
<td>11 lbs/ton</td>
</tr>
<tr>
<td>Wheat (grain)</td>
<td>0.53 lbs/bu</td>
</tr>
<tr>
<td>Wheat (grain &amp; straw)</td>
<td>0.64 lbs/bu</td>
</tr>
</tbody>
</table>

#### How to Calculate Crop \( \text{P}_2\text{O}_5 \) Removal Over a Six Year Period

**Step 1**
Determine average P uptake during the crop rotation (multiply expected yields by values above).
Ex: 170 bu Corn - \[170 \times 0.34\] = 58 lbs \( \text{P}_2\text{O}_5 \) removed per year
45 bu Soybeans - \[45 \times 0.82\] = 37 lbs \( \text{P}_2\text{O}_5 \) removed per year
Average = 48 lbs \( \text{P}_2\text{O}_5 \) removed per year

**Step 2**
Determine the amount of \( \text{P}_2\text{O}_5 \) that is typically applied in manure applications.
Ex: 4000 gals/ac \(*\) 35 lbs \( \text{P}_2\text{O}_5 \) /1000 gals \(*\) 0.8 = 112 lbs \( \text{P}_2\text{O}_5 \) applied

**Step 3**
Divide step 2 by the average in step 1; Ex: 112/48 = 2.3
Then take 6 years divided by this result and round down to the nearest whole number.
Ex: 6 years/2.3 = 2.6 (manure can be applied 2 out of 6 years without expecting soil P build-up).
Manure Spreader Calibration

Solid Manure

Step 1
Weigh the spreader both empty and full.
Subtract the empty weight from the full weight to determine the tons of manure per load.

Step 2
Calculate how many acres are covered by one load - multiply the distance traveled by the width of the spread.
Example: 800 ft traveled x 20 ft spread = 16,000 sq ft = 0.37 acres per load
6 tons per load / 0.37 acres covered per load = 16 tons/acre

Alternative to Step 2
Calculate how many loads it takes to cover a field when going at a known tractor speed.
Example: 30 loads x 6 tons per load = 180 tons applied
180 tons applied / 11 acres covered = 16 tons/acre

Liquid Manure

Step 1
Determine 1000’s of gallons per load by multiplying tank volume by 90%.

Step 2
Determine acres covered per load using the same procedure as in Step 2 for solid manure.
How to Take a Manure Sample

Liquid samples can be taken by dipping a plastic cup or small can attached to a pole, and solid samples can be taken with a pitchfork, shovel, or plastic glove. You will need a clean 5 gallon bucket for mixing sub-samples, as well as a sample bottle/container from the lab. After mixing many sub-samples in the bucket, transfer a smaller sample to the lab bottle/container.

<table>
<thead>
<tr>
<th>Sample Source</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loaded Liquid Tanker or Solids Spreader</td>
<td>Take sub-samples from many loads and mix in bucket to get a representative sample. Avoid large chunks of manure.</td>
</tr>
<tr>
<td>Liquid Manure Storage Structures</td>
<td>Take sub-samples from many depths and locations and mix in bucket to get a representative sample. Avoid sampling the bottom foot, edges, scum, and debris.</td>
</tr>
<tr>
<td>Stockpile or Manure Pack</td>
<td>Take many sub-samples from different depths and locations and mix together in bucket to get a representative sample. Avoid sampling the outer 1 ½ feet.</td>
</tr>
<tr>
<td>Scrape and Haul</td>
<td>Scrape the floor or lot at many locations and mix together in bucket to get a representative sample. Avoid areas very close to waterers, drains, or feedbunks.</td>
</tr>
<tr>
<td>Litter</td>
<td>Take many sub-samples to the depth of the floor throughout the house and mix together in bucket to get a representative sample. Avoid areas very close to feeders or waterers.</td>
</tr>
<tr>
<td>Overhead Irrigation, Traveling Gun, or Towed Hose.</td>
<td>Prior to application place many catch pans or buckets in the field, or take many sub-samples at the pump, and mix in one bucket to get a representative sample.</td>
</tr>
</tbody>
</table>

For more information, refer to U of MN publication “Livestock Manure Sampling”.
# Land Application of Manure Record Keeping Requirements* 

<table>
<thead>
<tr>
<th>100 – 299 AU</th>
<th>300 or More AU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manure test results</td>
<td>Manure test results</td>
</tr>
<tr>
<td>Field ID &amp; acreage</td>
<td>Field ID &amp; acreage</td>
</tr>
<tr>
<td>Date, method, incorp. timing, and rate of manure application</td>
<td>Crop grown, previous crop, yield goal, N needs of the crop</td>
</tr>
<tr>
<td>Carry-over N from previous manure applications</td>
<td>Date, method, incorp. timing, and rate of manure application</td>
</tr>
<tr>
<td>Manure N available to crops</td>
<td>Carry-over N from previous manure applications</td>
</tr>
<tr>
<td>Fertilizer N applied</td>
<td>Manure N available to crops</td>
</tr>
<tr>
<td>Total lbs N available/acre to crops (manure + fertilizer)</td>
<td>Fertilizer N applied</td>
</tr>
</tbody>
</table>

**a** No records are required if less than 100 AU

---

**Transferred-Ownership of Manure**

<table>
<thead>
<tr>
<th>Feedlot Owner Requirements</th>
<th>Cropland Manager Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manure transfer date and amounts</td>
<td>Manure test results (from feedlot)</td>
</tr>
<tr>
<td>Manure test results (provide to recipient)</td>
<td>Stockpiling practices and locations (stockpile owner)</td>
</tr>
<tr>
<td>Who manure was transferred to</td>
<td>Field locations &amp; acreage</td>
</tr>
<tr>
<td>Stockpiling practices (from recipient)</td>
<td>Date, method, incorporation timing, and rate of manure application</td>
</tr>
<tr>
<td>Field locations (from applicator)</td>
<td>N &amp; P₂O₅ applied (account for all sources)</td>
</tr>
<tr>
<td>Application rates/acre (from applicator)</td>
<td>Soil P test dates and results</td>
</tr>
</tbody>
</table>

* Records of manure application must be kept for a minimum of 3 years. However, if manure is applied in sensitive areas or if the manure is generated at a CAFO or NPDES permitted facility, the records must be kept for a minimum of 6 years. 

---

*Records of manure application must be kept for a minimum of 3 years. However, if manure is applied in sensitive areas or if the manure is generated at a CAFO or NPDES permitted facility, the records must be kept for a minimum of 6 years.*
Spill Response

What To Do If You Have a Spill

• Tend to all injuries first and foremost!!!
• Plug culverts and tile inlets that manure could enter
• Contain the spill by creating berms to stop the manure flow
• Contact the Minnesota Duty Officer (1-800-422-0798) with:
  - the location, date, and time of spill,
  - what was spilled and the approximate amount spilled,
  - which local officials have been notified (sheriff, fire dept., etc.),
  - the responsible party,
  - any surface water(s) impacted,
  - what has happened or is happening now, and;
  - a call back number.
• Contact the County Feedlot Officer or MPCA
• Recover pooled manure and solids; get a pump truck if necessary
• Scrape large accumulations; leave vegetation if possible
• If spilled on the road, recover what is possible and scrape/sweep the remainder off of the road
• Work areas of bare soils and re-seed
Exhibit 10
To whom it may concern,

I am a graduating senior at University of Minnesota Duluth majoring in Geographic Information Systems (GIS). I anticipate obtaining my degree in May of this year. Towards this degree, I have completed classes in cartography, geoprocessing, image processing, spatial statistics, sustainability, and field geography.

As part of developing my professional background, I participate in a network of graphical information system professionals. Though this network, I was alerted to a volunteer opportunity for the Minnesota Center for Environmental Advocacy (MCEA), to analyze an image of a farm field to determine the acreage subject to various restrictions. I volunteered to complete this project.

In order to complete this project, I first was given the map of a proposed field site in Winona County, MN. After obtaining this document, I located and digitized the site outline using ArcGIS Pro. Included in the original document were several environmental restrictions that would inhibit manure application including, proximity to water, proximity to karst geology, slope, and soil composition. I set out to remove these problematic areas from the area of the field in order to calculate a “useable acreage”. Stream lines were obtained from MNDNR and buffered to 300 feet. A 1-meter Digital Elevation Model (DEM) was requested from MN Topo and from the elevation of the field, a slope layer was derived and classified into areas above and below 6% slope, the regulating cutoff. Soil information was available from the USDA and all soil classifications labeled in the original map as restricted were selected and converted to their own layer to be removed from the total area. I did gather information on karst geology as well but as the site did not contain any features, this restriction was skipped in my analysis. With the areas of restriction now defined, there was a relatively simple process of removing them from the original site area, (a process known as clipping), and a new site was returned, now containing only unrestricted land. I then calculated an acreage for both this derived area and the original field.

Based on this analysis, my conclusions are as follows. The entire field is approximately 65 acres in size. Of these acres, only 17.5 acres are not subject to a restriction of some kind, 73% of the site is regulated. The breakdown by restriction is as such. There is 36.5 acres of land within 300 feet of a stream at this site representing 56% of the total field area. Soil classes determined to be restricted make up 27.3 acres representing 42% of the site. Land determined to have a slope greater that 6% adds up to 3.6 acres or 5.5% of the site. Note these percentages don’t add to the 73% site restriction result due to multiple restriction areas overlapping at the site.

This analysis is subject to the following limitations. As a result of the original outline of the field being digitized by hand, some small variations in actual acreage may have occurred. Also, as I am not an expert on the environmental policy surrounding manure application, it is possible that I either omitted or misrepresented a restricting factor in my workflow. However, based on the information I was provided with by my contacts at the MCEA, I believe my result to be an accurate approximation of the restricting factors found at this site and evidence that regulations on the proposed field could pose problems to future land use and manure application.

Thank you for your consideration,

Luke Henry
2/13/2020
MANURE APPLICATION NOTES:
Winter application is NOT permitted within 300' Buffer or slopes greater than 6%.
Non-Winter application within 300' Buffer needs 100' grass buffer on rivers and lakes, or 50' grass buffer on all other waterways. If insufficient buffer or within Tile Intake Buffer you must incorporate immediately.
There is NO application within 25' of any waterway and within 100' of all wells.
If soil tests exceed 21 ppm Bray/16 ppm Olsen in 300' Buffer, Phosphorus must be applied at crop removal rates.
Exhibit 11
Applying Manure in Sensitive Areas

State requirements and recommended practices to protect water quality

Revised May 2005
Applying Manure in Sensitive Areas

Purpose
This publication describes Minnesota state rule requirements and recommended practices to protect water quality when applying manure in the most common environmentally sensitive areas. All people applying manure, including those who do not need a permit or written manure management plan, are required to follow setbacks and other rules regarding sensitive areas.

Overview
Manure can be a valuable resource or a pollutant. When properly managed and applied, manure supplies nutrients and improves soil properties. But when poorly managed and applied, manure can degrade water quality. Some sites are more vulnerable to contamination of surface or ground water quality, including land near waters or near pathways to water.

Surface water protection. The risk of polluting surface waters increases when manure is applied to high phosphorus soils, steep slopes, or land near lakes, streams, ditches, wetlands, or open tile intakes. Surface runoff can carry phosphorus, microbial pathogens, ammonia, and oxygen-depleting substances. Water quality in sensitive areas can be protected by practices like using immediate incorporation or injection, maintaining setback distances, applying manure less frequently, planting vegetative buffers, and reducing excess nutrient additions.

Ground water protection. Groundwater can be contaminated by microbial pathogens or nutrients from manure. Pathogens can move directly to ground water through cracks in the soil, especially near old wells, mines, quarries, sinkholes, and shallow soils over fractured bedrock. Diverting or filtering runoff before it enters these paths to ground water prevents pollution. Incorporating manure into the soil before runoff occurs also decreases the chances of pollution. Because nitrate leaching through the soil from manure and fertilizer can contaminate ground water, nitrogen must be applied at the proper rate. To further reduce nitrate leaching, manure application should be properly timed, especially in coarse-textured soils and vulnerable lands near public water supply wells.

Rules for applying manure to all land
Several rules apply to all land where manure is applied, regardless of the distance to sensitive areas. For example, state rules limit nitrogen rates on all fields where manure is applied. Estimated plant-available nitrogen from all sources may not exceed expected crop nitrogen needs for non-legumes and expected nitrogen removal for legumes. Manure from all storage areas holding manure from more than 100 animal units must be tested for nutrient content. In addition, for all feedlots where manure management plans are required, manure cannot be applied to bare, harvested fields in June, July, or August unless a cover crop is planted for the remainder of the growing season.

For more information about nitrogen rate limits, manure and soil testing requirements, or manure management plan and record-keeping requirements, see the Minnesota Pollution Control Agency (MPCA) publication Land Application of Manure—Minimum State Requirements on-line at www.pca.state.mn.us/hot/feedlot-management.

Storing and stockpiling manure in sensitive areas
State requirements for manure stockpiling or liquid manure storage in sensitive areas are described in Minnesota Rules pts. 7020.2125 and 7020.2100. Information about stockpiling restrictions is at www.pca.state.mn.us/hot/feedlots.html.
Local ordinances
When local ordinances are more restrictive than state rules, the local ordinances must be followed. To find more information about local ordinances that may be more restrictive than state rules, contact your county planning and zoning office.

Recommended practices
Some practices are not required in state and local rules, but are recommended regardless of livestock numbers. For example, sheet, rill and gully erosion should be controlled on all land receiving nutrient applications. Recommended management practices for sensitive areas are noted throughout this publication. The USDA Natural Resources Conservation Service (NRCS) requires many of these management practices as a condition of receiving cost share money for nutrient management. More information about recommended nitrogen practices throughout the state is on-line at www.manure.umn.edu/applied/application.html.

To find out more about identifying and protecting sensitive areas, contact your county University of Minnesota Extension Service, USDA NRCS, soil and water conservation district, planning and zoning office, county environmental services office, or the nearest subdistrict office of the Minnesota Pollution Control Agency.

Finding the Information You Need
You will probably not need to read this publication from cover to cover. Turn to the pages describing sensitive areas on your farm and find out:

1. How to identify the sensitive area
2. Minimum state requirements for applying manure in the area
3. Recommended management practices that may also be necessary to receive state/federal cost share payments

Perennial and intermittent streams .............................................. 3
Lakes and protected wetlands ..................................................... 4
Drainage ditches .......................................................................... 5
Open tile intakes .......................................................................... 6
Steeply sloping land ..................................................................... 6
Road ditches ................................................................................ 7
Frequently flooded soils ............................................................... 7
High water table soils ................................................................... 7
High phosphorus soils ................................................................. 8
Wells and wellhead protection areas ........................................... 9
Sinkholes ..................................................................................... 9
Coarse-textured soils ................................................................. 10
Shallow soils over bedrock ........................................................... 10
Mines and quarries ..................................................................... 10
Summary of winter/non-winter setbacks .................................. Back cover
Perennial and intermittent streams

Identifying perennial and intermittent streams
Perennial streams flow continuously. Intermittent streams typically flow after storms or when snow melts, and can flow continuously for extended periods of time. Both are on United States Geological Survey quadrangle maps found at county soil and water conservation district offices or on-line at www.terraserver-usa.com.

Minimum state requirements

- 0 to 25 feet
  - No manure application is permitted within 25 feet from the ordinary high water level.
- 25 to 300 feet
  - Inject or incorporate within 24 hours and before rainfall.
  - Manage phosphorus to prevent long-term build-up of soil P (see page 8: High phosphorus soils).
  - Do not apply manure to frozen or snow-covered soils in this zone, even if a buffer exists.
  - Do not apply with irrigation equipment such as a center pivot or traveling gun.
- An interim permit is needed if applying manure from feedlots with more than 300 animal units along streams and intermittent streams where average soil phosphorus levels exceed 75 ppm Bray P1 (or 60 ppm Olsen) or where slopes exceed six percent.

Exceptions to state requirements

- Immediate incorporation and phosphorus management are recommended, but not required, if a 100-foot-wide permanent vegetative buffer (non-manured) is planted along perennial streams, or a 50-foot-wide buffer is planted along intermittent streams.
- Requirements for manure application exclude areas of intermittent streams that are maintained as in-field grassed waterways for erosion control.

Recommended voluntary practices

- Phosphorus management and immediate incorporation are recommended on all land that slopes toward streams, even if the land is more than 300 feet from the stream and has vegetative buffers.
- See page 7: Frequently flooded soils.
Lakes and protected wetlands

Identifying lakes and protected wetlands
State-required setbacks apply to all protected lakes and wetlands identified on Minnesota Department of Natural Resources protected waters and wetlands maps. Protected wetlands are typically more than ten acres in rural areas. Maps showing protected lakes and protected wetlands are available at local Soil and Water Conservation District offices or on-line at www.dnr.state.mn.us/waters/watermgmt_section/pwi.

Minimum state requirements

- **0 to 25 feet**
  - No manure application is permitted within 25 feet of the ordinary high water level.

- **25 to 300 feet**
  - Inject or incorporate within 24 hours and before rainfall.
  - Manage phosphorus to prevent long-term build-up of soil P (see page 8: High phosphorus soils).
  - Do not apply manure to frozen or snow-covered soils in this zone, even if a buffer exists.
  - Do not apply manure with irrigation equipment such as a center pivot or traveling gun.

- An interim permit is needed if applying manure from feedlots with more than 300 animal units along lakes and protected wetlands where average soil phosphorus levels exceed 75 ppm Bray P1 (or 60 ppm Olsen) or where slopes exceed six percent.

Exceptions to state requirements

- Immediate incorporation and phosphorus management are recommended, but not required, if a 50-foot-wide permanent vegetative buffer (non-manured) is planted along the wetland or a 100-foot-wide vegetative buffer is planted along the lake.

- Manure applications are allowed on seasonally saturated soils that are seeded to annual farm crops or crop rotations of perennial grasses or legumes.

Recommended voluntary practices

- Phosphorus management and immediate incorporation are recommended on all land that slopes toward lakes or wetlands, even if the land is more than 300 feet from the lake or wetland and even if the wetland is not considered a DNR-protected wetland.

- See page 8: High phosphorus soils.
Drainage ditches

Identifying drainage ditches
These requirements apply to edge-of-the-field drainage ditches shown on United States Geological Survey quadrangle maps and other ditches constructed after the maps were developed. The maps can be found at county Soil and Water Conservation District offices or on-line at www.terraserver-usa.com.

Minimum state requirements

- 0 to 25 feet
  - No manure application is permitted.
- 25 to 300 feet
  - Inject or incorporate within 24 hours and before rainfall.
  - Manage phosphorus to prevent long-term build-up of soil P (see page 8: High phosphorus soils).
  - Do not apply manure to frozen or snow-covered soils in this zone, even if a buffer exists.
  - Do not apply manure through irrigation equipment such as a center pivot or traveling gun.
- An interim permit is needed if applying manure from feedlots with more than 300 animal units along drainage ditches where average soil phosphorus levels exceed 75 ppm Bray P1 (or 60 ppm Olsen) or where slopes exceed six percent.

Exceptions to state requirements

- These practices are not required if an earthen berm along the drainage ditch prevents runoff into the drainage ditch. If drainage water enters side inlets through the berm, the practices are required.
- Immediate incorporation and phosphorus management are recommended, but not required, if a permanent vegetative buffer (at least 50 feet wide and non-manured) is planted along the ditch.

Recommended voluntary practices

- Phosphorus management and immediate incorporation are recommended on all land that slopes toward drainage ditches, even if the land is more than 300 feet from the ditch and a vegetative buffer is planted.
- See page 8: High phosphorus soils.
Open tile intakes

Identifying open tile intakes
Open tile intakes include man-made openings in the ground that move unfiltered and untreated runoff waters into underground pipes, which discharge the runoff into ditches or other surface waters.

Minimum state requirements
- Inject or incorporate manure within 24 hours.
- An interim permit is needed if applying manure from feedlots with more than 300 animal units within 300 feet of open tile intakes where average soil phosphorus levels exceed 75 ppm Bray P1 (or 60 ppm Olsen) or where slopes exceed six percent.

Exceptions to state requirements
- NPDES permit conditions must be followed when they are more restrictive than minimum state requirements.

Recommended practices
- Phosphorus management and immediate incorporation are recommended on all land that slopes toward open tile intakes, even if the land is more than 300 feet from the intake.

Steeply sloping land

Identifying steeply sloping land
Slopes of more than six percent are identified on soil survey maps with the letter C or D after the soil name. Slopes between two and six percent are identified with the letter B after the soil name. Soils with slopes of more than six percent are listed in the table “Sensitive Soil Features for Nutrient Management” available at NRCS offices and on-line at www.mn.nrcs.usda.gov/technical/ecs/nutrient/assessment/assessment.htm.

Minimum state requirements
- An interim feedlot permit is needed if manure from facilities with more than 300 animal units is to be applied regularly to soils within 300 feet of lakes, streams, intermittent streams, DNR-protected wetlands, and open tile intakes with slopes of more than six percent.
- NPDES permitted feedlots must follow winter-time slope restrictions of 2% (liquid) and 6% (solid), or as required in the permit.

Recommended voluntary practices
- Avoid applying manure on land where gully erosion is not controlled.
- Control sheet and rill soil losses (< 2.5 tons/acre/year) when manure is applied to steep slopes.
- Avoid winter application to steep slopes if possible. Use contour tillage if winter application is planned. (Required for NPDES permitted feedlots.)
Road ditches

Identifying road ditches

Road ditches are low-lying areas next to roads that could become channels for storm water or melted snow. If a road ditch is identified on United States Geological Survey quadrangle maps as an intermittent stream, follow requirements for intermittent streams on page 3.

Minimum state requirements

- No manure application directly into road ditches, including all land from the lowest point in the channel to the crests of ditch banks.

Recommended voluntary practices

- After storms or when snow melts, a road ditch can become a flowing channel that carries pollutants to waters. Consider using the same protective management practices as for “Perennial and intermittent streams” (page 3) when applying manure near road ditches.

Frequently flooded soils

Identifying frequently flooded soils

Frequently flooded soils (flooded 50-100 times in 100 years) are identified on soil surveys, listed in the table “Sensitive Soil Features for Nutrient Management” available at NRCS offices and on-line at www.mn.nrcs.usda.gov/technical/ecs/nutrient/assessment/assessment.htm.

Minimum state requirements

- No specific state requirements are set for applying manure on frequently flooded soils. Nitrogen rate limits (based on expected yields) pertain to all soils where manure is applied. Nutrient rate requirements are described in the publication Land Application of Manure: Minimum State Requirements, which can be found on-line at www.pca.state.mn.us/hot/feedlot-management.

Recommended voluntary practices

- Avoid manure application during peak flooding periods.
- Avoid manure application when the ground is frozen, snow-covered, or actively thawing.
- Immediately incorporate manure when there is risk of flooding.

High water table soils

Identifying high water table soils

Soils with water tables of two feet or less in depth are identified on the table “Sensitive Soil Features for Nutrient Management” available at NRCS county offices (along with soil survey information showing water table depths) and on-line at www.mn.nrcs.usda.gov/technical/ecs/nutrient/assessment/assessment.htm.

Minimum state requirements

- No specific state requirements are set for manure application onto high water table soils.

Recommended voluntary practices

- To reduce the chance of bacteria moving into ground water, select fields and manure application techniques that maximize the separation between applied manure and the water table. Try to keep at least a 24-inch separation above seasonal high water tables.
High phosphorus soils

Identifying high phosphorus soils

High phosphorus soils can be identified through a soil sampling and testing program. Soil sampling techniques are described on the nutrient management page at www.manure.coafes.umn.edu/applied/soil_testing. Laboratories that analyze for soil phosphorus can be found at www.mda.state.mn.us (go to “MDA A to Z” and click on “S” and “Soil Testing Laboratories”).

Minimum state requirements

- Required phosphorus management practices for manure from all feedlots are summarized in the table below. The phosphorus levels refer to field average.
- Soil phosphorus testing is required by cropland managers when manure is applied from feedlots with 300 or more animal units (including when manure ownership is transferred).

<table>
<thead>
<tr>
<th>Bray P1 (ppm)*</th>
<th>Olsen (ppm)*</th>
<th>More than 300 ft from lakes, streams, intermittent streams, protected wetlands, or unbermed drainage ditches</th>
<th>Less than 300 ft from lakes, streams, intermittent streams, protected wetlands, or unbermed drainage ditches</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 22</td>
<td>&lt; 17</td>
<td>No phosphorus management requirements</td>
<td>No phosphorus management requirements</td>
</tr>
<tr>
<td>22 – 75</td>
<td>17 – 60</td>
<td>No phosphorus management requirements unless within 300 ft of tile intakes.</td>
<td><strong>Prevent long-term build-up of soil P</strong></td>
</tr>
<tr>
<td>76 – 150</td>
<td>61 – 120</td>
<td>***Permit needed if manure is from feedlot with more than 300 au</td>
<td>***Permit needed if manure is from feedlot with more than 300 au</td>
</tr>
<tr>
<td>&gt; 150</td>
<td>&gt; 120</td>
<td></td>
<td><strong>Prevent long-term build-up of soil P</strong></td>
</tr>
</tbody>
</table>

*If soil P test results are reported in lb/acre, divide by 2 for approximate levels in ppm (e.g., 200 lb/acre = 100 ppm). If a Mehlich III test is used (instead of Bray P1 or Olsen), then the values in the table columns are roughly <30, 31-90, 91 to 180, and over 180.

** The rate and frequency of manure applications must not allow soil phosphorus build-up over any six-year period. Single-year applications can be based on crop nitrogen needs if excess phosphorus is removed by subsequent crops. Depending on the crop, soil type, and manure nutrient levels, soil P build-up can usually be prevented when applying manure one to three times over a six-year period. Phosphorus build-up is not prohibited if a vegetative buffer is planted along the water (see exceptions).

*** Interim permit applications must include a manure management plan that describes how phosphorus will be managed to prevent pollution from phosphorus transport. Options include reducing frequency/amount of application, changing feed or feed additives to reduce phosphorus in manure, soil conservation practices, and planting crops to remove excess phosphorus. The Minnesota Phosphorus Index or NRCS 590 Standard can be used to demonstrate adequate protection of waters.

Exceptions to state requirements

Phosphorus is allowed to build up to 75 ppm Bray P1 or 60 ppm Olsen on soils within 300 feet of waters if a permanent, non-manured, vegetative buffer is established along the water. The vegetative buffer must be a minimum of 100 feet wide along lakes and streams and 50 feet wide along intermittent streams, wetlands and unbermed drainage ditches.

Recommended voluntary practices

- Begin manure applications on soils with lower phosphorus levels and use all available acres.
- Avoid build-up of soil phosphorus once levels reach the point where additional phosphorus seldom increases crop yield (21 ppm Bray P1 and 16 ppm Olsen).
- Avoid continuous annual manure applications onto soils with phosphorus levels of more than 75 ppm Bray P1 (60 ppm Olsen) regardless of the distance to waters.
- Avoid manure applications to soils with phosphorus levels of more than 150 ppm.
- Increase soil erosion control measures as phosphorus levels increase. For example, control erosion to less than 4 tons per acre per year on fields with phosphorus levels exceeding 21 ppm Bray P1 (16 ppm Olsen).
- Use grain types and feed additives that reduce phosphorus in manure.
- Inject or incorporate manure within 24 hours and prior to rainfall.
- Plant field edge vegetative filter strips.
Wells and wellhead protection areas

Identifying wells and wellhead protection areas
Wells include all active wells and inactive wells that have not been sealed in accordance with Minnesota Department of Health (MDH) requirements. Wellhead protection areas include all land supplying water to a public water system, through which potential contaminants are likely to move and reach the well. Drinking Water Supply Management Areas (DWSMAs) encompass the technically defined wellhead protection area and have identifiable landmarks as boundaries. To identify DWSMAs, contact the local public water supplier or the MDH at (800) 818-9318 or on-line at www.health.state.mn.us/divs/eh/water/swp/swa.

Minimum state requirements
• Maintain a 50-foot setback when applying manure.
• Nitrogen rate limits (based on expected yields) pertain to all soils where manure is applied. Nutrient rate requirements are described in the publication Land Application of Manure: Minimum State Requirements found on-line at www.pca.state.mn.us/hot/feedlot-management.
• Detailed manure application records must be kept when feedlots with 100 or more animal units apply manure in a DWSMA where the aquifer has been determined to be vulnerable in the local wellhead protection plan.
• An interim permit is needed if manure from facilities with more than 300 animal units is to be applied regularly in a DWSMA where the well and area are designated vulnerable. The permit application must include a manure management plan.

Exceptions to state requirements
• The required set back increases to 100 ft. for agricultural wellheads in fields managed by NPDES permit holders.

Recommended voluntary practices
• Inject or immediately incorporate all manure applied to land where runoff waters may flow toward active wells that are not properly grouted or inactive wells that are not properly sealed.
• Delay manure applications in the fall until average daily soil temperatures at a six-inch depth are below 50 degrees F (to maintain nitrogen in forms that generally do not leach).
• Divert field runoff away from wells, especially old or poorly constructed wells.

Sinkholes

Identifying sinkholes
Sinkholes are surface depressions caused by a collapse of soil or overlying formation above fractured or cavernous bedrock. For the purposes of manure application restrictions only, sinkholes include easily recognizable depressions in the landscape.

Minimum state requirements
• Maintain a 50-foot setback from the edge (100 ft. for NPDES permitted feedlots).
• Inject or immediately incorporate when applying manure within 50 to 300 feet on the upslope side of a sinkhole.

Exceptions to state requirements
• Incorporation is not required if berms or diversions tamed runoff from entering the sinkhole.

Recommended voluntary practices
• Divert field runoff from sinkholes (where needed to protect water quality), or plant vegetative filter strips on the upslope side of sinkholes.
Coarse-textured soils

Identifying coarse-textured soils
Coarse-textured soils include all soils identified in soil surveys as a sand, loamy sand, loamy coarse sand, fine sand, loamy fine sand, very fine sand, or any soil modified by the word “gravelly.” If a soil is questionable, refer to soil survey manuals found at the county Soil and Water Conservation District office. Additionally, coarse-textured soil mapping units are identified on the table “Sensitive Soil Features for Nutrient Management” available at NRCS county offices and online at www.mn.nrcs.usda.gov/technical/ecs/nutrient/assessment/assessment.htm.

Minimum state requirements
• At NPDES permitted feedlots, fall application onto fields with more than 1/3 coarse-textured soils must be delayed until soil temperatures in the upper six inches are less than 50° F.
• Nitrogen rate limits (based on expected yields) pertain to all soils where manure is applied.

Recommended voluntary practices
• Avoid fall applications to coarse-textured soils whenever possible. If fall application is necessary, wait until average daily soil temperatures at a six-inch depth are below 50 degrees F.

Shallow soils over bedrock

Identifying shallow soils over bedrock
Areas with bedrock less than or equal to 40 inches deep are identified in the table “Sensitive Soil Features for Nutrient Management” available at NRCS county offices and online at www.mn.nrcs.usda.gov/technical/ecs/assessment/assessment.htm. Metal rods or soil probes can also verify whether fractured bedrock is within two feet of the ground surface.

Minimum state requirements
• No specific state requirements are set for manure application onto shallow soils over fractured bedrock.

Recommended voluntary practices
• To reduce the chance of bacteria moving into ground water, select fields and manure application techniques that maximize the separation between applied manure and fractured bedrock. Try to keep at least a 24-inch soil separation above bedrock.
• Avoid fall applications to areas with shallow soils over bedrock if possible. If fall application is necessary, wait until average daily soil temperatures at a six-inch depth are below 50 degrees F.

Mines and quarries

Identifying mines and quarries
Mines and quarries include human excavations to remove stone, gravel, sand, iron, or other minerals.

Minimum state requirements
• Maintain a 50-foot setback for manure application from the edge of the mine or quarry.

Recommended voluntary practices
• Within 300 feet upslope of the mine or quarry, inject or incorporate manure within 24 hours of rainfall or runoff.
• Divert runoff waters from entering the mine or quarry.
• Plant vegetative buffers around mines or quarries.
<table>
<thead>
<tr>
<th>Sensitive Areas</th>
<th>Winter Setbacks</th>
<th>Non-Winter Setbacks</th>
<th>Other Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A: Surface Application</td>
<td>B: Incorp. + P mgmt</td>
<td>C: Incorp. NO P mgmt</td>
</tr>
<tr>
<td>Streams/inter. streams</td>
<td>300'</td>
<td>*300'</td>
<td>25'</td>
</tr>
<tr>
<td>Lakes and wetlands</td>
<td>300'</td>
<td>*300'</td>
<td>25'</td>
</tr>
<tr>
<td>Drainage ditches</td>
<td>300'</td>
<td>*300'</td>
<td>25'</td>
</tr>
<tr>
<td>Open tile intakes</td>
<td>**300'</td>
<td>**300'</td>
<td>0'</td>
</tr>
<tr>
<td>Steeply sloping land</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Road ditches</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Frequently flooded soils</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>High phosphorus soils</td>
<td>—</td>
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<td>—</td>
</tr>
<tr>
<td>High water table soils</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Wells/wellhead protection</td>
<td>50'</td>
<td>50'</td>
<td>50'</td>
</tr>
<tr>
<td>Sinkholes (without berms or diversions)</td>
<td>50’ down</td>
<td>300’ up</td>
<td>50’ down</td>
</tr>
<tr>
<td>Coarse-textured soils</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Shallow soils over bedrock</td>
<td>50’</td>
<td>50’</td>
<td>50’</td>
</tr>
</tbody>
</table>

**A** = Surface application with NO incorporation within 24 hours

**B** = Injection or incorporation within 24 hours AND phosphorus management***

**C** = Injection or incorporation within 24 hours with NO phosphorus management***

— = No specific requirements.

*Setbacks can be reduced from 300’ to either 100’ (lakes and perennial streams) or 50’ (wetlands, drainage ditches, and intermittent streams) if permanent vegetative buffers that are at least 100 and 50 feet wide are planted along the waters.

**The 300’ open tile intake setback for non-incorporated surface application of solid manure is exempted until 2005.

***Phosphorus management means that the application rate and frequency over six-year periods will not result in soil P build-up where soil P already exceeds 21 ppm Bray P1 or 16 ppm Olsen.
Exhibit 12
ANALYSIS

The Nitrogen Problem: Why Global Warming Is Making It Worse

New research shows that increases in rainfall and extreme weather because of climate change will increase the amount of nitrogen polluting rivers and other waterways. The findings underscore the urgency of reforming agriculture to dramatically reduce the use of nitrogen fertilizers.

BY RICHARD CONNIFF • AUGUST 7, 2017

It is a painful lesson of our time that the things we depend on to make our lives more comfortable can also kill us. Our addiction to fossil fuels is the obvious example, as we come to terms with the slow motion catastrophe of climate change. But we are addicted to nitrogen, too, in the fertilizers that feed us, and it now appears that the combination of climate change and nitrogen pollution is multiplying the possibilities for wrecking the world around us.

A new study in Science projects that climate change will increase the amount of nitrogen ending up in U.S. rivers and other waterways by 19 percent on average over the remainder of the century – and much more in hard-hit areas, notably the Mississippi-Atchafalaya River Basin (up 24 percent) and the Northeast (up 28 percent). That’s not counting likely increases in nitrogen inputs from more intensive agriculture, or from increased human population.
Instead, Stanford University researcher Eva Sinha and her co-authors simply took historical records of nitrogen runoff as a result of rainstorms over the past few decades, recorded by the U.S. Geological Survey. Then, assuming for the sake of argument that there will be no change in the amount of nitrogen being added to the environment, they calculated how much additional nitrogen would be leached out of farm fields and washed down rivers solely because of extreme weather events and increased total rainfall predicted in most climate change scenarios. The bottom line: “Anticipated changes in future precipitation patterns alone will lead to large and robust increases in watershed-scale nitrogen fluxes by the end of the century for the business-as-usual scenario.”

Lakes and other freshwater bodies now routinely face toxic blue-green algae blooms that are fueled by nitrogen pollution.

But the business-as-usual scenario is of course already in trouble, even without climate change. Headlines have tended to fixate on the Gulf of Mexico “dead zone” produced by nitrogen flushed down the Mississippi River from the cornfields of the upper Midwest. (This year’s “dead zone” is the largest ever, the National Oceanic and Atmospheric Administration announced last week.) But the problem is already much broader than that, says senior author Anna M. Michalak, also of Stanford, citing a series of recent incidents caused by nitrogen pollution. Last summer, for instance, a 33-square-mile algae bloom caused Florida to declare a four-county state of emergency. Another closed the Dungeness crab fishery along half of the Washington State coast last year and affected other fisheries as far south as Mexico.

The combined effect of climate change and nitrogen pollution is also evident on inland waterways, according to Hans Paerl, an aquatic ecologist at the University of North Carolina’s Institute of Marine Sciences. In the past, cleanup efforts on lakes and other freshwater bodies could achieve major improvements just by targeting phosphorous pollution, also from fertilizer. But now they routinely face toxic blue-green algae (or cyanobacteria) blooms, fueled by nitrogen pollution. That problem is being exacerbated, Paerl and his co-authors argued in a study last year, by warmer temperatures and increased rainfall associated with climate change. Efforts by water quality managers to protect the water supply may not work in the future, they wrote, because climate change introduces so many new uncertainties about hydrology, stratification, and nutrient dynamics.
These toxic algae blooms have become alarmingly widespread in recent decades, according to Paerl. One such bloom in the western end of Lake Erie forced Toledo, Ohio, to cut off the water supply temporarily to 500,000 residents in 2014. The same thing happened in China's Lake Taihu in 2007, leaving 2.3 million people without water. The threat to human health was not hypothetical. Blue-green algae toxins in the drinking water at a dialysis center in Brazil caused 76 deaths from acute liver failure in a 1996 incident. Those toxins have also caused liver damage in children drinking from China's Three Gorges Reservoir. In the United States, a 2015 study found evidence of blue-green algae blooms in 62 percent of the 3,100 U.S. counties surveyed and concluded that these blooms were "significantly related to the risk of non-alcoholic liver disease death."

The problem with nitrogen is evident, finally, even on land. Atmospheric nitrogen – from intensive farming and livestock operations, power plants, road traffic, and other sources – now gets deposited everywhere, making soils more fertile. That has the paradoxical effect of reducing plant diversity by displacing native species adapted to nutrient-poor soils. A study last year in *Proceedings of the National Academy of Sciences (PNAS)* examined more than 15,000 forest, woodland, grassland, and shrubland sites across the United States and found that a quarter of them have already exceeded the nitrogen levels associated with species loss. Researchers don't know yet how nitrogen and climate change together will affect plant diversity. But in an experiment in an arid southern California habitat, added nitrogen together with changing rainfall patterns caused a community of native shrubs to shift to non-native grasses.

Farmers are acutely aware of their leading role in this unfolding disaster. In Europe, they have managed to reduce...
nitrogen use substantially without any decrease in productivity over the past quarter century because of mandatory European Union limits. The United States has so far relied on a voluntary approach, with mixed results. But when the city of Des Moines, Iowa sued upstream farm counties two years ago for the cost of equipment to remove nitrogen runoff from its drinking water supply, many farmers heard alarm bells. (A federal court ultimately dismissed the lawsuit early this year.)

“I haven’t seen a willingness to engage in a conservation program like this in my lifetime,” says Nick Goeser, a soil scientist and director of the Soil Health Partnership. The issue resonates with farmers in part because applying nitrogen fertilizer accounts for up to half the cost of running a farm, and they would naturally prefer the expenditure to pay off in increased yield rather than have it wash away down the river. They recognize that nitrogen runoff is contaminating their own drinking water, says Goeser, and they have also noticed the effects of climate change on their crops.

The Soil Health Partnership, which combines agribusiness funding with technical advice from the Environmental Defense Fund and the Nature Conservancy, works to scale up three solutions to the nitrogen problem—use of off-season cover crops to reduce the runoff that inevitably occurs when fields remain bare through the winter, low- or no-till farming, and “advanced nutrient management,” or what Goeser describes as “spoon-feeding” nitrogen in the precise amount and time that the plant needs it.
None of that is as simple as it may sound. For instance, use of cover crops “makes an incredible difference, with a 60-80 percent improvement in runoff,” says Goeser. It’s expensive, however, and could actually decrease corn or soybean yield the following year if the farmer does it wrong. It only starts to improve resilience to extreme weather events like flooding or drought, and thus yield, after three to five years. But in the Midwest, says Goeser, 60 percent of the acreage is operated on a one-year rental basis, meaning farmers have no incentive to invest in the long-term health of the land. Fewer than 5 percent of them plant cover crops.

Advanced nutrient management means switching from applying fertilizer in the fall to the spring, and not all at once in the spring, but in small doses throughout the season, with sensors indicating exactly how much nitrogen a specific section of field actually needs. But the 10-foot-high equipment to work with a growing crop is expensive.

Among the long-term solutions being proposed are genetically-engineered cereals that fix nitrogen from the atmosphere and lab-cultured meat.

The combined threat of climate change and nitrogen pollution could soon mandate far more dramatic changes in agriculture. Among the long-term solutions put forward by University of Victoria researchers in a companion piece to the new study in Science: Genetically-engineered cereals to fix nitrogen from the atmosphere, and laboratory cultured meat, to reduce the global herd from 1.5 billion head of cattle to a population of just 30,000 that will be used as stem-cell donors. Climate change means that it will be necessary, the co-authors note, to cut agricultural nitrogen use in the Mississippi River Valley not by 32 percent, as the U.S. Environmental Protection Agency now proposes, but by almost double that amount.

The challenge will be far greater in the developing world, particularly Asia. The Stanford-led research team identified three risk factors that make an area more vulnerable to the compounding effects of nitrogen pollution and climate change: heavy nitrogen inputs (mostly for agriculture), a high current rate of precipitation, and a large projected increase in precipitation because of climate change.

East, South, and Southeast Asia face the greatest peril, with India especially vulnerable “because it exhibits all three risk factors across more than two-thirds of its area ... and has one of the fastest-growing populations.” People throughout the region “are heavily dependent on surface water supplies,” the researchers note. But as climate change multiplies the rate of nitrogen runoff, they may increasingly find their water undrinkable.

Correction, August 8, 2017: An earlier version of this article incorrectly attributed to Nick Goeser the statement that farmers recognize that nitrogen runoff is poisoning their drinking water. Goeser did not use the word poisoning.
Richard Conniff is a National Magazine Award-winning writer whose articles have appeared in *The New York Times*, *Smithsonian*, *The Atlantic*, *National Geographic*, and other publications. His latest book is *House of Lost Worlds: Dinosaurs, Dynasties, and the Story of Life on Earth*. He is a frequent contributor to *Yale Environment 360*. MORE ➤
Exhibit 13
Quick facts

Over-applying nitrogen (N) to corn causes concern due to the environmental consequences of unused N. There's also a significant economic advantage to applying the correct rate of N fertilizer.

Excess, unused N can be lost from the soil system via denitrification and/or leaching, get tied up in the soil organic N pool or stay in the crop's rooting zone as residual N.

Research indicates that measuring residual, available N through a soil test can refine earlier N recommendations for corn. This soil N test involves collecting 0- to 2-foot soil samples in the spring before planting and analyzing samples for nitrate-N. The quantity of nitrate-N found is then used to calculate a residual N credit.

Soil N test research

About the study

In the 1980s, increased interest in economic and environmental concerns led researchers to revisit the concept of including a soil N test to refine fertilizer N recommendations for corn in Minnesota's humid regions.

A major research study conducted from 1989 through 1992 provided data from 59 sites in 19 counties (see Figure 1). This led to the development of a new soil N test throughout Minnesota.

Research was conducted on a variety of soil types, primarily on farmers' fields. A host of sampling depths, times and analysis parameters were evaluated in countless combinations. Grain yield response to N was best indicated by soil nitrate-N measured from a two-foot sampling depth.

Study results

The direct correlation between yield response to N and soil N test wasn't as strong as desired, but subsequent calculations led to a strong correlation between soil nitrate-N at preplant time and unaccounted N using the traditional recommendations (i.e., without using a soil test).
The unaccounted N was deemed to be residual N. You can see this relationship for one set of data in Figure 2, which is the basis for the residual N credit in Figure 3.

![Figure 2: Linear relationship between 0 and 2 feet of nitrate-N concentrations measured before planting and residual N credit for a subset of the dataset](image)

Using the soil N test

This soil N testing option, which accounts for residual N, isn't appropriate for all fields and conditions.

Use Figure 4 to help decide which fields you may need to test for residual nitrate-N. This flowchart uses factors such as previous crop, manure history and a knowledge of previous rainfall.

![Figure 4: Flowchart decision-aid for determining the probability of having significant residual N in the soil.](image)

Compatibility with other procedures

Although the western tier of Minnesota has long had a process for factoring soil N test information into corn N recommendations, western Minnesota producers can use this newer procedure too.

Slight differences in N recommendations may appear when comparing the two procedures for a given site due to mathematical rounding differences inherent in each procedure.

Factors to consider

First, evaluate whether conditions exist for residual N to accumulate. A soil N test isn't necessary for all Minnesota acres to be planted to corn.

Research evaluating N recommendations made with and without the preplant soil N test identified some conditions where the new preplant soil nitrate-N test has the greatest utility and impact.
Consider previous crop, soil texture, previous rainfall and manure history to determine which fields are most likely to benefit from the N test, as these factors significantly affect the accumulation of residual N.

**Previous crop**

A crop rotation that has corn following corn generally provides the greatest potential for significant residual N accumulation. This is probably due to the amount of fertilizer N added to the previous corn crop, the fact that corn doesn’t scavenge excess N from the soil – in contrast to a legume – and frequent manure additions made to continuous corn fields.

In contrast, when soybean is the previous crop, much less residual N has been measured. Soybeans will use residual N in the soil in addition to the N that it symbiotically fixes within its nodules.

**Soil texture**

The new soil N test works best on medium- and fine-textured soils derived from loess or glacial till. Using the proposed soil N test on coarse-textured soils derived from glacial outwash doesn’t appear to be promising. Outwash sites consistently had low soil N test values in the study, and you can’t expect to measure significant residual N in these sandy soils.

**Rainfall**

The amount of residual N in the soil also depends on the rainfall received the previous year. In a year following a widespread drought (e.g., 1989), the majority of fields will have significant residual N. However, following relatively wet years, such as the early 1990s, you can expect little residual N.

**Manure applications**

Previous manure applications to a field generally increase residual N in the soil. While the perception is that the most recent manure applications (year of or year after application) would best be reflected by the soil N test, research experience indicates that the residual effects – two, three or four years after application – are best-quantified by this new test.

**How to make nitrogen recommendations**

You can make nitrogen fertilizer recommendations for corn with or without the new soil N test.

The University of Minnesota’s previous N recommendations, which assume minimal residual N, are still the starting point for all recommendations. This is because the soil N test is used to estimate residual, available N.

Here’s a suggested five-step process for determining the N recommendation:

1. Determine N recommendation using yield goal, previous crop and organic matter content for the specific field. Use Table 1 (Table 1 in Fertilizing Corn in Minnesota) to do this. The prescribed rate recommendation assumes you’ll follow best management practices for the specific conditions.
2. Determine whether conditions are such that residual N may be appreciable. Figure 4, which includes factors such as previous crop, manure history and previous fall rainfall can provide insight as to the applicability of testing for N. If conditions are such that the probability of residual N is small and soil testing for N isn’t recommended, use the N recommendation derived in Step 1. 
3. If soil N testing is recommended, collect a preplant, 0- to 2-foot soil sample, taking enough soil cores so the sample is representative of the entire field. Then, send the sample to a laboratory for nitrate-N analysis.
4. Determine residual N credit based on the measured soil nitrate-N concentrations. Use Figure 3 to determine this credit.
5. Calculate the final N recommendation by subtracting the residual N credit (Step 4) from the previously determined N recommendation (Step 1). This fertilizer N amount can then be applied either preplant and/or as a sidedress application.
Don’t use this soil N test if you applied commercial fertilizer the previous fall. The variability in the degree of N conversion to nitrate-N before the spring makes this test meaningless in these situations.

**Manure additions**

Manure additions to soil can significantly increase soil nitrate-N concentrations. However, the amount of nitrate-N at any given time (i.e., spring preplant) is a function of the time of manure application and method of application.

The following scenarios may help you understand how to most effectively use the new soil N test in combination with manure management to determine N recommendations.

**When a soil N test isn’t used**

When a soil N test isn’t used, credit manure N. Do this by calculating the amount of N that will be available (manure rate x manure N content x N availability) and subtracting this amount from the N recommendation determined based on yield, organic matter and previous crop.

**Spring manure applications**

If you’re applying manure in the spring before corn planting, collect the soil samples for N measurement before manure application. Determine the N recommendation and then separately calculate the manure N credit and subtract this amount from the previous N recommendation derived from the soil N test.

**Winter manure applications**

If you applied manure during the winter months, it’s assumed that the majority of the inorganic N would be lost via volatilization. So, you can use the soil N test to determine an N recommendation.

However, you should subtract the manure N credit — although less than that of spring-applied manure — from this amount. Keep in mind that spring sampling can occur anytime after the frost is out of the ground.

**Fall manure applications**

**Oct. 1 to Dec. 1**

If you applied manure the previous fall between Oct. 1 and Dec. 1, you can’t use the soil N test or the manure N worksheet credit system.

Not taking a soil N test and just using the standard manure N crediting system may result in high fertilizer recommendations if significant residual N was present before the manure was applied.

In contrast, only using the spring soil N test to credit fall-applied manure will underestimate the credit due to the manure. This is because all of the available manure N will not have converted to nitrate-N by this time.

If manure had been applied in this time frame and the previous crop was soybeans, base the N recommendation on the standard manure crediting system. If corn was the previous crop, base the N recommendation on the soil N test, knowing that the soil test may underestimate the available N coming from the manure.

**Before Oct. 1**

If you applied manure the previous fall before Oct. 1, the soil N test will probably pick up most of the N from manure that will be available during the growing season. The amount of N released from manure’s organic N fraction after taking the preplant sample will be minor compared to the accuracy of the N recommendation provided by the soil testing option.
The test does an excellent job accounting for residual N where manure had been applied 11 months or more before collecting the preplant soil N test samples. This test should work particularly well in situations with a long history of manure applications.

Other procedures for N recommendations

Western Minnesota

Soil N testing has been a management tool for western Minnesota (see Figure 1) for many years. It's recommended to take the late fall or spring preplant N soil test and then subtract the measured amount of nitrate-N according to the following formula.

\[ N_{\text{Rec}} = (1.2)(Y_G) - STN_{(0-24 \text{ in.})} - N_{\text{PC}} \]

Where:

- \( N_{\text{Rec}} \) = Amount of fertilizer N needed, in pounds per acre
- \( Y_G \) = Realistic yield goal, in bushels per acre
- \( STN_{(0-24 \text{ in.})} \) = amount of nitrate-nitrogen
  
  \((NO_3 - N)\) measured by using the soil nitrate test, in pounds per acre
- \( N_{\text{PC}} \) = Nitrogen credits, if any, for previous crops in the rotation, in pounds per acre

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- \( N_{\text{PC}} \) = Nitrogen credits, if any, for previous crops in the rotation, in pounds per acre

Eastern and central Minnesota

In the rest of the state, corn nitrogen recommendations have traditionally been made using a much different approach.

The approach specific to western Minnesota isn’t appropriate for eastern and central Minnesota, due to the higher rainfall it receives. For N recommendations in regions with higher rainfall, use Table 1. The table accounts for organic matter levels, previous crop and expected yield.

The well-drained silt loam soils in southeastern Minnesota receive the N recommendations listed for soils with a medium and high organic matter level. All irrigated soils are included in the medium and high organic matter category.

For small grains, use the N credits only if stubble is tilled after harvest. If there was no tillage, use recommendations for crops in Group 2.

Table 1: Nitrogen recommendations for corn where the soil nitrate test isn’t used

<table>
<thead>
<tr>
<th>Crop grown last year</th>
<th>Organic* matter level</th>
<th>Yield goal: 70–90 bushels per acre (bu/a)</th>
<th>Yield goal: 91–110 bushels per acre (bu/a)</th>
<th>Yield goal: 111–130 bushels per acre (bu/a)</th>
<th>Yield goal: 131–150 bushels per acre (bu/a)</th>
<th>Yield goal: 151–170 bushels per acre (bu/a)</th>
<th>Yield goal: 171–190 bushels per acre (bu/a)</th>
<th>Yield goal: 191+ bushels per acre (bu/a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa (4+ plants per square foot), non–harvested sweetclover</td>
<td>Low (less than 3%)</td>
<td>0 lbs. per acre</td>
<td>0 lbs. per acre</td>
<td>0 lbs. per acre</td>
<td>0 lbs. per acre</td>
<td>30 lbs. per acre</td>
<td>50 lbs. per acre</td>
<td>70 lbs. per acre</td>
</tr>
<tr>
<td>Alfalfa (4+ plants per square foot), non–harvested sweetclover</td>
<td>Medium and high (3% or more)</td>
<td>0 lbs. per acre</td>
<td>0 lbs. per acre</td>
<td>0 lbs. per acre</td>
<td>0 lbs. per acre</td>
<td>0 lbs. per acre</td>
<td>20 lbs. per acre</td>
<td>40 lbs. per acre</td>
</tr>
</tbody>
</table>

https://extension.umn.edu/nitrogen/soil-testing-corn-nitrogen-recommendations#manure-additions-759613
<table>
<thead>
<tr>
<th>Crop grown last year</th>
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<th>Yield goal: 151-170 bushels per acre (bu/a)</th>
<th>Yield goal: 171-190 bushels per acre (bu/a)</th>
<th>Yield goal: 191+ bushels per acre (bu/a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybeans, small grains, alfalfa (1 or fewer plants per square foot)</td>
<td>Low (less than 3%)</td>
<td>20* lbs. per acre</td>
<td>50* lbs. per acre</td>
<td>80* lbs. per acre</td>
<td>110 lbs. per acre</td>
<td>140 lbs. per acre</td>
<td>160 lbs. per acre</td>
<td>180 lbs. per acre</td>
</tr>
<tr>
<td>Soybeans, small grains, alfalfa (1 or fewer plants per square foot)</td>
<td>Medium and high (3% or more)</td>
<td>0 lbs. per acre</td>
<td>30 lbs. per acre</td>
<td>60 lbs. per acre</td>
<td>80 lbs. per acre</td>
<td>110 lbs. per acre</td>
<td>130 lbs. per acre</td>
<td>150 lbs. per acre</td>
</tr>
<tr>
<td>Edible beans, field peas, harvested sweetclover</td>
<td>Low (less than 3%)</td>
<td>40 lbs. per acre</td>
<td>70 lbs. per acre</td>
<td>100 lbs. per acre</td>
<td>130 lbs. per acre</td>
<td>160 lbs. per acre</td>
<td>180 lbs. per acre</td>
<td>200 lbs. per acre</td>
</tr>
<tr>
<td>Edible beans, field peas, harvested sweetclover</td>
<td>Medium and high (3% or more)</td>
<td>20 lbs. per acre</td>
<td>50 lbs. per acre</td>
<td>80 lbs. per acre</td>
<td>100 lbs. per acre</td>
<td>130 lbs. per acre</td>
<td>150 lbs. per acre</td>
<td>170 lbs. per acre</td>
</tr>
<tr>
<td>Group 1 crops (see below for list)</td>
<td>Low (less than 3%)</td>
<td>0 lbs. per acre</td>
<td>15 lbs. per acre</td>
<td>45 lbs. per acre</td>
<td>75 lbs. per acre</td>
<td>105 lbs. per acre</td>
<td>125 lbs. per acre</td>
<td>145 lbs. per acre</td>
</tr>
<tr>
<td>Group 1 crops (see below for list)</td>
<td>Medium and high (3% or more)</td>
<td>0 lbs. per acre</td>
<td>15 lbs. per acre</td>
<td>45 lbs. per acre</td>
<td>75 lbs. per acre</td>
<td>95 lbs. per acre</td>
<td>115 lbs. per acre</td>
<td></td>
</tr>
<tr>
<td>Group 2 crops (see below for list)</td>
<td>Low (less than 3%)</td>
<td>60 lbs. per acre</td>
<td>90 lbs. per acre</td>
<td>120 lbs. per acre</td>
<td>150 lbs. per acre</td>
<td>180 lbs. per acre</td>
<td>200 lbs. per acre</td>
<td>220 lbs. per acre</td>
</tr>
<tr>
<td>Group 2 crops (see below for list)</td>
<td>Medium and high (3% or more)</td>
<td>40 lbs. per acre</td>
<td>70 lbs. per acre</td>
<td>100 lbs. per acre</td>
<td>120 lbs. per acre</td>
<td>150 lbs. per acre</td>
<td>170 lbs. per acre</td>
<td>190 lbs. per acre</td>
</tr>
</tbody>
</table>

*Increase these recommendations by 20 pounds of N per acre to compensate for less N credit on coarse-textured soils.

**Group 1 crops**
- Alfalfa (2-3 plants per square foot)
- Alsike clover
- Birdsfoot trefoil
- Grass/legume hay
- Grass/legume pasture
- Fallow
- Red clover

**Group 2 crops**
• Buckwheat
• Canola
• Corn
• Flax
• Grass hay
• Grass pasture
• Millet
• Mustard
• Potatoes
• Sorghum-sudan
• Sugarbeets
• Sunflowers
• Sweet corn
• Vegetables

Reviewed in 2018

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Exhibit 14
Nitrogen Fertilizer Recommendations for Corn in Iowa

This pamphlet replaces all earlier guidelines for using the late-spring test for soil nitrate and all previous nitrogen fertilizer recommendations based on corn yield goals and credits for N supplied by legumes and animal manures. Recommendations concerning applications of animal manures are provided in Pm-1596a, Managing manure nutrients for crop production.

Nitrogen fertilization is essential for profitable corn production. It also is a major cost of production and can contribute to degradation of the environment. The economic and environmental costs of N fertilization are more important than in the past, and they are likely to become even more important in the future. These costs provide compelling reasons for intensifying efforts to improve N management practices.

The late-spring test for soil nitrate is a new technology that enables site-specific assessments of plant-available N just before the crop begins rapid uptake of N. Use of this test should help corn producers manage N to increase their profits while reducing environmental degradation. All producers are encouraged to use this test, but the way the test is used depends on whether or not the producer exercises the option for in-season fertilization (i.e., N applications after corn plants are 6 inches tall).

Producers who apply all their N before emergence of the crop (i.e., before planting, at planting, soon after planting) should apply N at rates indicated in Table 1 and use the late-spring test to evaluate their N management. Select rates within the ranges given by considering price for fertilizer, expected price for grain, supply of subsoil moisture, and feedback given by the end-of-season cornstalk test in previous years. If price and yield outlook are favorable, select the upper part of the range; if unfavorable, select the lower part of the range.

| Table 1. Rates of N usually needed if all N is applied preplant or before crop emergence (option for in-season application of N not exercised). |
|---------------------------------|---------------------------------|-----------------|
| Crop category                  | N rate (lb. N/acre)             |                 |
| Corn on recently manured soils | 0-90                            |                 |
| Corn after established alfalfa | 0-30                            |                 |
| 2nd-year corn after alfalfa    | 0-60                            |                 |
| Other corn after corn          | 150-200                         |                 |
| Corn after soybean (no manure) | 100-150                         |                 |

Additional information is provided on page 4.

Producers who use the option for in-season fertilization (i.e., split applications or all applied after corn plants are 6 inches tall) should apply N at rates indicated in Table 2 and then use the late-spring test to estimate additional amounts of N needed. Rates within the range given should be selected based on the extent to which the producer wants to rely on in-season fertilization, amounts of rainfall during the previous six months, and feedback given by the end-of-season cornstalk test in previous years.

Application of some N before crop emergence is desirable to avoid the possibility of early-season deficiencies and to reduce risks associated with weather conditions that prevent in-season fertilization. Application of all N before planting, however, reduces the ability to adjust N rates for the effects of spring weather on amounts of N supplied by the soil or the amounts lost during spring rainfall. Use of the late-spring test over a period of years provides information that can be used to optimize pre-emergence applications of N.

| Table 2. Rates of N to apply before crop emergence if the option for in-season fertilization is exercised. |
|---------------------------------|-------------------|
| Category                        | N rate (lb. N/acre) |
| Corn on recently manured soils  | 0-30               |
| Corn after established alfalfa  | 0-30               |
| 2nd-year corn after alfalfa     | 0-30               |
| Other corn after corn           | 50-125             |
| Corn after soybean (no manure)  | 0-75               |

The 30-lb. rates could be applied as a starter.
Soil Sampling and Testing

**Time of Soil Sampling**
Soil samples should be collected when corn plants are 6 to 12 inches tall (measured from the ground surface to the center of the whorl).

**Selecting Test Areas**
Soil samples should be collected within several test areas that are 1 to 10 acres and seemingly uniform with respect to soil characteristics and management histories. Care should be taken to avoid unusual spots (e.g., sites of old barnyards, feedlots, or manure piles, field edges or ends where fertilizer applicators may have made skips or double applications, abnormal patches of growing weeds or plant residues, or small areas where corn plants suggest differences in N availability).

The optimal number of test areas per farm should be expected to vary with many factors. First-year users of the test should consider testing about five areas for the first 100 acres and two more areas for each additional 100 acres. Information gathered in the first year can be used to help select future sampling strategies that are appropriate for a particular farm.

**Depth of Soil Sampling**
Samples collected for the late-spring soil test must be representative of the surface foot of soil.

**Number of Cores per Sample**
Soil samples analyzed for this test should be derived from at least 16 to 24 cores. Care should be taken to ensure that the soil samples are collected in a manner that is not biased by the presence of corn rows or bands of fertilizer. At least 24 cores should be collected if anhydrous ammonia was applied for the present crop.

Sampling bias can be minimized by collecting soil samples in "sets of eight" cores that have various assigned positions relative to corn rows. By this method, the person doing the sampling moves in a random pattern within the test area to select approximate positions for collecting cores. Each time a core is collected, however, its exact position is selected relative to the two nearest corn rows. The first core is collected in a row. The second is collected one-eighth of the distance between any two rows after moving to another part of the test area. The third is collected one-quarter of the distance between any two corn rows after moving to another part of the test area. The process is continued until the eighth core is collected seven-eighths of the distance between any two corn rows.

The soil from all cores should be crushed and thoroughly mixed before a subsample is removed for analysis.

**Handling and Shipping Soil Samples**
Moist soil samples should be protected from temperatures above 75°F and should be refrigerated if they cannot be analyzed within two days. Mailing usually poses no problem if the samples are without refrigeration for no more than two days. Assume that soil testing laboratories will protect the samples as soon as they are received.

Soil samples expected to be without refrigeration for more than two days should be dried as soon as possible. Samples can be air-dried by spreading in a thin layer on paper — a fan will accelerate drying. Samples can be dried in an oven provided the temperature does not exceed 250°F.

Soils that are extremely wet or muddy should not be sampled. Incorrect results will be obtained if water “drips” from the samples.

**Soil Analysis**
The late-spring test is based on concentrations of nitrate-nitrogen (NO₃-N) in the soil sample. Most soil testing laboratories can perform this analysis. Nitrate concentrations also can be measured on the farm by using commercially available kits.

This pamphlet expresses nitrate concentrations in terms of ppm nitrate-N (parts of N per million parts of dry soil), which is the same as ppm N as nitrate. Concentrations expressed as ppm nitrate must be multiplied by 0.23 to be converted to ppm nitrate-N.

Users of the soil test should be alert to the possibility of incorrect results on individual samples. Errors can occur during collection, handling, and analysis of samples. The impact of such errors can be substantially reduced by observing trends in soil test results and using caution when making recommendations on results that deviate from these trends.
Soil Test-based N Recommendations

Manured Soils, First-year Corn After Alfalfa, and Second-year Corn After Alfalfa
Soils that have received recent applications of animal manures or have decaying sods with alfalfa roots seem to mineralize more plant-available N after the time of soil sampling than do other soils. These soils, therefore, are treated as a separate category when making N fertilizer recommendations. These recommendations are given in Table 3.

The first step for making recommendations from Table 3 is to decide whether the top half of the table or the lower half of the table best describes the current prices for grain and fertilizer.

Table 3. Nitrogen fertilizer recommendations for manured soils and corn after alfalfa.

<table>
<thead>
<tr>
<th>Grain and Soil test fertilizer nitrate ppm N</th>
<th>Recommended N rate Excess Rainfall Rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unfavorable</td>
<td>0-10 90 90</td>
</tr>
<tr>
<td>(1 bu buys 11-15 lb. of N)</td>
<td>16-20 0 60</td>
</tr>
<tr>
<td>&gt; 20</td>
<td>0 30</td>
</tr>
<tr>
<td>Favorable</td>
<td>0-10 90 90</td>
</tr>
<tr>
<td>(1 bu buys 11-15 lb. of N)</td>
<td>16-25 0 60</td>
</tr>
<tr>
<td>&gt; 25</td>
<td>0 0</td>
</tr>
</tbody>
</table>

a A field should be considered manured if animal manures were applied with a reasonable degree of uniformity since harvest of the previous crop or in 2 of the past 4 years.

b Rainfall should be considered excess if rainfall in May exceeded 5 inches.
c Addition of 30 lb. N/acre may have no detectable effects on profits, but producers could reasonably elect to apply this rate.

The second step is to decide whether the “excess rainfall” column or the “normal rainfall” column of the table best describes weather conditions before the soils were sampled.

The third step is to use the results of the soil test to select the appropriate N rate specified. Interpolation between specified N rates is appropriate when site conditions fall between those given.

Corn After Soybean and Corn After Corn
The first step in making a fertilizer recommendation for this crop category is to select a critical concentration for nitrate (i.e., the concentration that distinguishes between adequate and inadequate supplies of available N). A critical concentration of 25 ppm-N is appropriate in absence of additional information.

The second step is to adjust the critical concentration if excess rainfall occurred at the site shortly before the soils were sampled. Reducing the critical concentration by 3 to 5 ppm is advised if rainfall is more than 20 percent above normal amounts between April 1 and time of soil sampling.

The third step is to estimate fertilizer needs by subtracting the concentration of soil-test nitrate (ppm-N) from the chosen critical concentration (ppm-N). This value is then multiplied by 8. A factor of 8 is used because studies have shown that it usually takes about 8 lb. of N/acre before planting to increase soil-test nitrate-N by 1 ppm.

Examples: A soil test of 15 ppm and a critical concentration of 25 ppm results in a recommendation of 80 lb. of N per acre to be applied.

(25 ppm - 15 ppm) x 8 = 80 lb. N/acre needed

A soil test of 35 ppm and a critical concentration of 25 ppm indicates that the soil already has approximately 80 lb. of N more than needed.

(25 ppm - 35 ppm) x 8 = -80 lb. N/acre needed.
Yield Goals and Nitrogen Credits

Yield goals (or potentials) are no longer used when making N fertilizer recommendations because research has shown no relationship between optimal rates of N fertilization and yields at these optimal rates.

The use of legume and (or) manure credits has been eliminated. The effects of those sources of N are addressed by giving recommendations for separate categories.

Addressing Variability

The best rate of N fertilization for corn varies greatly with year and location. This variability is caused by complex interactions of soil factors, management practices, and weather. Time and method of N application are important because they influence amounts of N lost before it can be used by the corn.

Great variability in optimal rates of N fertilization is a problem because the best rates across a wide range of conditions usually are not best for most individual sites in a given year. This problem was unavoidable in the past, but advances in technology offer new opportunities for site-specific management of N.

Users of the soil test should expect much greater variability in amounts of N supplied by animal manures and legumes than would be expected from commonly used methods to calculate N credits. Research has shown that this variability should be considered a reason for using the soil test rather than evidence that the test is not reliable.

Reliability of the Soil Test

The soil test should be considered only a tool for estimating availability of N in soils. Like any tool, the usefulness of this test varies with the skill of the user. First-time users are encouraged to experiment with the test in small areas before using it to guide fertilization on all their fields.

Recommendations for using the soil test are intended to maximize profits for the producer when used across many sites and years. Because many factors that influence fertilizer needs at a specific site and year happen after the soils are tested, the soil test should not be expected to be a perfect predictor of fertilizer needs. Use of the soil test is recommended because it is more reliable than other methods of estimating N fertilizer needs. Moreover, it is likely that the reliability of the soil test can be improved as new knowledge is acquired.

Where Caution is Required

The soil test may underestimate amounts of plant-available N when (1) nitrification inhibitors or urease inhibitors are applied with fertilizers, (2) more than 150 lb. N/acre are applied as anhydrous ammonia, and (3) more than 150 lb. N/acre are applied as injected manure.

Use of the soil test on sandy soils may require deeper sampling if fertilizers are applied before crop emergence and unusually large amounts of rainfall occur between fertilization and sampling. There are relatively few sandy soils in Iowa.

End-of-season Cornstalk Testing

Users of the late-spring test are encouraged to use the end-of-season cornstalk test, which is described in ISU Extension factsheet, Cornstalk Testing to Evaluate Nitrogen Management, PM-1584. The end-of-season test essentially asks if the corn crop had too little, too much, or optimal amounts of N. The resulting information can be used to evaluate the reliability of the soil test or any other system of making N recommendations. When used over a period of several years, information provided by the cornstalk test can be used to help select rates of N application that are most appropriate for the soil factors and management practices that make sites differ in N fertilizer requirements.

Prepared by A.M. Blackmer and R.D. Voss, professors; and A. P. Mallarino, assistant professor, ISU Department of Agronomy.

. . . and justice for all

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File: Agronomy 8-5
Exhibit 15
Guidelines for Applying Manure to Cropland and Pasture in Wisconsin
Guidelines for Applying Manure to Cropland and Pasture in Wisconsin

Fred Madison, Keith Kelling, Leonard Massie and Laura Ward Good

Land application of manure is the only practical management alternative for most Wisconsin farmers. When manure is applied to cropland and broken down by soil microorganisms, nutrients are released and recycled for crop production. Care must be taken, however, to ensure that manure is applied where it can decompose and the nutrients be used by plants without contaminating surface water or groundwater.

Proper manure management and handling is complicated. This publication describes how to maximize manure’s benefits to plants and soils and to minimize the possibility of surface or groundwater pollution from manure applications.

Benefits and Hazards of Applying Manure

Manure is a resource. It provides essential nutrients for crop growth and adds organic matter to soils. Manure improves soil structure, or tilth, and increases the soil’s ability to hold water and nutrients and to resist compaction and crusting. Well-structured soils trap rainwater and allow it to infiltrate, thus reducing the potential for runoff and erosion.
Manure’s value as a fertilizer has been overlooked for many years. Recently, however, increased commercial fertilizer costs and smaller farm profit margins have enhanced the value of manure for crop production. Farmers today are finding that planning for manure management makes good economic sense.

Environmental concerns also dictate the need for careful manure management planning. The phosphorus (P) contained in manure can affect lake and stream water quality by stimulating weed and algae growth. The nitrogen (N) in manure may be converted through the action of soil bacteria to the nitrate form which, if unused by plants, can move through the soil and into the groundwater. High nitrate levels in drinking water (greater than 10 parts per million) can cause health problems for babies; pregnant women; and, in combination with nitrates from food sources, livestock. Movement of nitrate to groundwater is more likely to be a problem in areas with sandy soils and a water table near the land surface, or where shallow soils cover fractured limestone or sandstone bedrock.

In addition, odors can be a problem when manure is applied to the land surface or when stored manure is agitated before hauling and spreading. These problems can be minimized if manure is injected when there are calm winds, cool temperatures and low humidity.
Manure’s Value as Fertilizer

Typical amounts of the three major plant nutrients contained in fresh manure from livestock and poultry operations are shown in Table 1. In addition to N, P, and potassium (K), manure contains other elements essential to plant growth such as calcium, magnesium, sulfur, boron, manganese, copper and zinc. The exact amounts of crop nutrients contained in various animal manures depend on the method of manure collection and storage, the kind and amount of bedding or litter used, and the amount and type of feed. Having a manure sample analyzed at a laboratory to determine its nutrient content will provide farm-specific information.

Much of the total nutrient content of manure is not immediately usable by plants. Decomposition must first release the nutrients held in organic compounds before they become available for plant uptake and use. Other nutrients in manure may be transformed to unavailable forms or lost as gases to the air (volatilized). For example, about one-half of the N in manure is in a form which is released slowly as the manure decays; this process may take several years. Manure also contains ammonia-N which may be lost to the air if manure is surface-applied without incorporation.

As much as 50 percent of the total N and P and 40 percent of the K may be lost from manure on an open lot through volatilization, runoff or leaching. Up to 40 percent of the N and from 5 to 15 percent of the P and K may be lost during daily hauling and spreading. Taking into account decomposition rate and nutrient losses, the approximate first year available nutrient content portion of Table 1 shows how much of a particular nutrient is expected to be available in the first crop season after spreading.
Table 1: Manure Nutrient Contents

Approximate Total Nutrient Content¹

<table>
<thead>
<tr>
<th>Animal Type</th>
<th>Dairy</th>
<th>Beef</th>
<th>Poultry</th>
<th>Swine²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(lb/ton)</td>
<td>10</td>
<td>14</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>(lb/1000 gal)</td>
<td>28</td>
<td>39</td>
<td>69</td>
<td>55</td>
</tr>
<tr>
<td>Phosphate (P₂O₅)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(lb/ton)</td>
<td>5</td>
<td>9</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>(lb/1000 gal)</td>
<td>14</td>
<td>25</td>
<td>69</td>
<td>27</td>
</tr>
<tr>
<td>Potash (K₂O)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(lb/ton)</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>(lb/1000 gal)</td>
<td>28</td>
<td>31</td>
<td>33</td>
<td>34</td>
</tr>
</tbody>
</table>

Approximate First-Year Available Nutrient Content (Fertilizer Value)¹

<table>
<thead>
<tr>
<th>Animal Type</th>
<th>Dairy</th>
<th>Beef</th>
<th>Poultry</th>
<th>Swine²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manure not incorporated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(lb/ton)</td>
<td>3</td>
<td>4</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>(lb/1000 gal)</td>
<td>8</td>
<td>10</td>
<td>35</td>
<td>22</td>
</tr>
<tr>
<td>Manure incorporated within 3 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(lb/ton)</td>
<td>4</td>
<td>4</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>(lb/1000 gal)</td>
<td>10</td>
<td>12</td>
<td>41</td>
<td>28</td>
</tr>
<tr>
<td>Phosphate (P₂O₅)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(lb/ton)</td>
<td>3</td>
<td>5</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>(lb/1000 gal)</td>
<td>8</td>
<td>14</td>
<td>38</td>
<td>15</td>
</tr>
<tr>
<td>Potash (K₂O)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(lb/ton)</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>(lb/1000 gal)</td>
<td>21</td>
<td>23</td>
<td>25</td>
<td>26</td>
</tr>
</tbody>
</table>

¹ These values have been rounded to the nearest whole pound.
² Assumes finishing unit.
Incorporate Manure Whenever Possible

Reduce nutrient losses and runoff pollution by incorporating manure

Whenever possible, manure should be injected or worked into the soil within 3 days after application to reduce volatilization and runoff losses. Note that incorporated manure has a higher first year available N content than unincorporated manure (Table 1).

To reduce the chances of surface water pollution from manure washing into waterways, do not apply more than 25 tons per acre of solid dairy manure (or its equivalent on a P-content basis as shown in Table 2) in any year unless it is incorporated. In no-till row crop production or on established hay fields and pastures, manure can not be worked into the soil. Avoid possible runoff pollution from areas that can not be tilled by limiting applications to 25 tons or less per acre of solid dairy manure (or its equivalent on a P-content basis) in any 5 year period.

Table 2: Manure Amounts with Phosphorous Levels Equivalent to 25 Tons of Solid Dairy Manure*

<table>
<thead>
<tr>
<th></th>
<th>Solid (tons)</th>
<th>Liquid (gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dairy</strong></td>
<td>25</td>
<td>9,000</td>
</tr>
<tr>
<td><strong>Beef</strong></td>
<td>14</td>
<td>5,000</td>
</tr>
<tr>
<td><strong>Swine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finishing unit</td>
<td>25</td>
<td>5,000</td>
</tr>
<tr>
<td>Farrow-nursery</td>
<td>25</td>
<td>13,000</td>
</tr>
<tr>
<td><strong>Poultry</strong></td>
<td>5</td>
<td>2,000</td>
</tr>
</tbody>
</table>

* Amounts are rounded to nearest whole ton or 1,000 gallons.
**Know Crop Nutrient Requirements**

Effective use of the nutrients in manure requires a knowledge of the crop’s nutrient requirements and the amounts of nutrients present in the soil as well as in the applied manure. Most soils should be tested every 3 to 4 years. The goal is to apply manure at rates equivalent to crop nutrient needs; nutrients completely reused by crops cannot run off to surface waters or percolate through the soil to the groundwater.

For information on soil testing and on crop nutrient requirements consult the University of Wisconsin-Extension publications: *Sampling Soils for Testing* (A2100), *Soil Test Recommendations for Field, Vegetable, and Fruit Crops* (A2809), *Corn Fertilization* (A3340), and *Nutrient Management: Practices for Wisconsin Corn Production and Water Quality Protection* (A3557). If you need additional assistance, contact your county Extension office.

Growers can confirm that the expected amount of manure-nitrogen is available to the crop during the growing season by using the pre-sidedress soil nitrate test.
Credit Manure-Nitrogen to Avoid Over-Application of Nitrogen

In Wisconsin, our guidelines allow manure applications at rates sufficient to meet, but not to exceed the N needs of agronomic crops. N supplied by manure should be taken into account before commercial N fertilizer is applied to a field to avoid over-application of N. If the manure you spread has not been analyzed, use the average first-year available N values shown in Table 1. For example, you may take an N credit of 3 pounds per ton of solid dairy manure for the application year. If solid dairy manure is worked into the soil within 3 days of spreading (incorporated), the credit is 4 pounds of N per ton. This credit can be increased to 5 pounds of N per ton when manure is applied annually to the same field at about the same rate for 3 or more years because manure continues to breakdown and provide N in the soil over a number of years. These credit recommendations assume average management and include some handling losses.

For example, on a silt loam soil in southern Wisconsin, the University of Wisconsin recommendation for corn is 160 pounds N per acre. Solid dairy manure spread at a rate of 25 tons per acre will provide 75 pounds of N per acre, and commercial fertilizer applications should be reduced by that amount to 85 pounds per acre. An application of 25 tons per acre of dairy manure that is incorporated will provide about 100 pounds of N per acre, and only 60 pounds of fertilizer N are recommended. If manure has already been applied to this field at this same 25 ton per acre rate for 3 years or more, there should be about 125 pounds of available N per acre, leaving only a 35 pound per acre N requirement to be supplied by fertilizer.

Manure N can be lost or released more slowly than expected, so growers may wish to confirm that the expected amount of manure N is available to the crop by using the pre-sidedress soil nitrate test. This test is especially valuable when most or all of the crop’s N needs are expected to come from manure N. It is performed when the corn is 6-12 inches tall, and will show whether there is an adequate reservoir to meet crop needs for the rest of the growing season. For more information on the pre-sidedress nitrate test see University of Wisconsin-Extension publication Soil Nitrate Tests for Wisconsin Cropping Systems (A3624).
**Crop rotation options**

Manure may be applied prior to planting most crops, although some crops will be harmed by heavy applications. For example, only modest (10-15 tons per acre) manure applications should be made prior to a small grain crop to avoid lodging of the crop if it is to be harvested for grain rather than silage.

Where alfalfa, soybeans, or other legumes are being rotated into corn, calculate the amount of N available from decomposition of the residues (the legume N credit) before making a manure application. In many cases, the additional N in manure will not be needed for a corn crop following alfalfa, and the manure might be more profitably used on an N-deficient field. Refer to Table 3 or the University of Wisconsin-Extension publication *Using Legumes as a Nitrogen Source* (A3517) for more information.

Manure applications preceding legumes do not constitute an added risk of excess nitrates leaching to groundwater, because legumes will take up available N (from manure or other sources) in the soil before expending energy to fix atmospheric N. However, topdress applications of manure to legume forages may cause some stand deterioration, unless the applications are light. Some growers have had success with 5 to 6 tons per acre topdress applications using a slinger-type manure spreader which breaks up the manure into fine particles and sprays it out uniformly.
### Table 3: Nitrogen Credits for Alfalfa and Soybeans in Wisconsin

<table>
<thead>
<tr>
<th>Medium and Fine Textured Soils</th>
<th>Sandy Soils</th>
</tr>
</thead>
<tbody>
<tr>
<td>last cut before Sept. 10</td>
<td>last cut after Sept. 10</td>
</tr>
<tr>
<td>190</td>
<td>150</td>
</tr>
<tr>
<td>160</td>
<td>120</td>
</tr>
<tr>
<td>130</td>
<td>90</td>
</tr>
</tbody>
</table>

#### Alfalfa

**Stand density**

- **Good** (70-100% alfalfa, more than 4 plants/ft²)
  - 190 lb N/acre
  - 150 lb N/acre
  - 140 lb N/acre
  - 100 lb N/acre

- **Fair** (30-70% alfalfa, 1.5 to 4 plants/ft²)
  - 160 lb N/acre
  - 120 lb N/acre
  - 110 lb N/acre
  - 70 lb N/acre

- **Poor** (0-30% alfalfa, less than 1.5 plants/ft²)
  - 130 lb N/acre
  - 90 lb N/acre
  - 80 lb N/acre
  - 40 lb N/acre

#### Second year credit:

In the second cropping year following fair and good stands on medium and fine textured soils, you can take a credit of 50 lb N/acre.

#### Soybeans

1 lb N/acre for each bu/acre of beans harvested up to a maximum credit of 40 lb N/acre. (Note: No credit on sandy soils)
Avoid Fields With High Phosphorus Levels

Applying manure to meet grain crop N needs will usually result in over-applications of P and/or K and, over time, the levels of these nutrients in the soil will increase. Most of the P reaching surface waters is attached to eroded soil particles. Erosion and runoff from soils with high levels of P can pollute surface waters. For most crops (potatoes are an exception) when soil-test P levels reach 75 ppm (150 pounds per acre) on a particular field, there will be no benefit to the crop from additional P, with the possible exception of a minimal amount in starter fertilizer. Plant P-demanding crops such as alfalfa, use appropriate runoff reduction practices, and reduce manure application rates. If soil-test P levels reach 150 ppm (300 pounds per acre), discontinue manure applications on that field, if possible, until soil-test P levels drop. On muck and sandy soils (sands and loamy sands) P removal practices should be started at soil test levels of 120 ppm and manure applications should be stopped at 240 ppm.*

If soil test phosphorus levels reach 150 ppm (300 lbs/a) — stop applying manure if possible and use additional runoff reduction practices. On muck and sandy soils, soil-test phosphorus levels may reach 240 ppm (480 lbs/a) before phosphorus-reduction practices are warranted.

If soil-test phosphorus levels reach 75 ppm (150 lbs/a) — plant phosphorus-demanding crops such as alfalfa, use appropriate runoff reduction practices, and reduce manure application rates.

Soil-test phosphorus levels on Field 3 are higher than 75 ppm. Adding phosphorus as manure or as phosphorus fertilizer will not benefit the corn crop.

* The extraction process used in testing soil P levels is more efficient for muck and sandy soils than for other soils. Soil P levels of 120 ppm and 240 ppm in muck and sandy soils represent approximately the same amount of plant-available P as levels of 75 ppm and 150 ppm in other soils.
Avoid Applications that Will Lead to Nitrate-Nitrogen Leaching to Groundwater

Sandy soils

Unique soil conditions in some areas of Wisconsin require special attention. Mobile nutrients such as N in the nitrate form and K may leach out of excessively drained, coarse-textured soils. If you apply manure to sands or loamy sands in the early fall at soil temperatures greater than 50 degrees F, N in manure will be converted to nitrate-N at a time when crops are not growing. The nitrate-N may be leached to groundwater during heavy rains in the fall or early spring.

On these soils, apply manure only where a cover crop will be established or after October 31 when soil temperatures are probably less than 50 degrees F. If a nitrification inhibitor is used, manure can be applied to these soils after mid-September. However, due to the high application rate required for a nitrification inhibitor to work with manure, this practice may not be cost-effective. Spring applications at temperatures over 50 degrees F are not a problem if crops are planted after the manure application.

Nitrate-nitrogen can rapidly leach from excessively drained, coarse-textured soils.
Thin soils over fractured bedrock

Manure applications in areas with thin soils over fractured limestone or poorly-cemented or fractured sandstone bedrock can cause significant groundwater problems. Nitrate that leaches through the soil can be carried comparatively rapidly to groundwater by water flowing down through the cracks in the bedrock.

Do not apply manure where there is less than 10 inches of soil over bedrock. Where the soil is only 10 inches to 20 inches thick over bedrock, do not apply more than 25 tons of dairy manure or its equivalent on an N-content basis and incorporate the manure within 3 days. Do not apply manure to these soils when they are frozen. Fall-applied manure should be spread after October 31 or with a nitrification inhibitor.

Nitrate-nitrogen leaching through the soil can be carried rapidly to groundwater by water flowing down through cracks in fractured bedrock.
Avoid Applications Where Manure Can Be Washed Directly to Surface Waters

Areas subject to periodic flooding or close to lakes and streams also pose problems. Heavy rainfall or snow melt can carry unincorporated manure from these lands directly to surface waters. The goal is to make applications where and when the risk of major runoff events is lowest. Do not apply manure within the 10-year flood plain (wet soils and other areas that are periodically flooded) or within 300 feet of streams and 1000 feet of lakes unless you incorporate it within 3 days.* Do not apply manure to these lands when the ground is frozen. Never apply manure in grassed waterways, terrace channels, open surface drains or other areas where water flow concentrates.

Do not apply manure to grassed waterways, terrace channels, open surface drains, or anywhere else that water flow concentrates.

Do not apply manure to land with wet soils that are periodically flooded (areas within the 10-year flood plain), within 300 feet of streams, or within 1000 feet of lakes unless you can incorporate it within 3 days.

Manure should not be applied to land within setback areas unless it can be worked into the soil within 3 days.

* At present, the US Department of Agriculture-Natural Resource Conservation Service’s Nutrient Management Standard 590 requires a setback of 200 feet from a stream or lake for spreading manure without incorporation. The setback distances recommended here are greater and coincide with the shoreland management areas ordinance boundaries established by the Wisconsin Shoreland Management Program as defined in NR 115.03 Wisconsin Administrative Rules.
The requirements for setbacks from lakes and streams often raise questions about applications in certain areas, particularly headlands, where manure is especially valuable because it reduces the compaction effects of heavy machinery traffic. You can spread manure on these areas immediately before tillage in the spring. The setbacks provide valuable buffer strips which protect surface water from manure-laden runoff, since water moving over them tends to lose its pollutant load. This recommendation is not intended to prevent manure applications on these critical land areas, but rather to reduce the environmental risks associated with such applications.
Restrict winter applications to the most level fields

Manure applied to frozen soil may be carried off to lakes and streams during thaws or during winter or early spring rains. To minimize this risk when soils are frozen, apply manure only to relatively flat fields (those with slopes of 6 percent or less). If these fields get washed by runoff from up-slope areas, protect them with diversions, terraces, grassed waterways or other appropriate conservation practices.

If you apply manure to frozen soils with slopes of 6 to 12 percent, contour strips (row cropping with alternate strips in forage), terraces, reduced tillage, or other conservation measures must be in place.* Grassed waterways must be well-established and maintained. Build terraces if appropriate, or contour and strip-crop the fields with alternate strips in sod. Row crops should be planted on the contour, and they should be protected with at least 30-percent ground cover from the previous year’s crop.

When soils are frozen, do not apply manure to fields with greater than 12% slope. If manure is applied to frozen fields with 6-12% slopes, conservation measures must be in place.

* Currently, the US Department of Agriculture-Natural Resource Conservation Service’s Nutrient Management Standard 590 requires the existence of conservation measures when manure is applied to frozen soils with slopes greater than 9%. We recommend that conservation practices be in place on fields with greater than 6% slope.
Plan Manure Applications to Make Sure Suitable Land Is Available

As long as they plan ahead, most livestock farmers in Wisconsin have enough suitable cropland available to apply manure even in the winter months. In planning manure applications, you need to be sure that the fields you plan to use meet the guidelines for slope, soil, tillage and site conditions summarized on page 20. If you haul during the winter, you should identify land areas which meet the requirements for winter application, and estimate the acreage you will need for the winter months.

For an example, we will determine acreage needed for manure from a 50-cow herd over the winter. One 1400-pound dairy cow produces about 115 to 125 pounds of manure daily.* During the 5 months (November to March) when the ground may be frozen, a 50-cow herd will produce about 500 tons of manure. At a maximum application rate of 25 tons per acre per year without incorporation, you’ll need 20 acres of cropland. You will need additional lands if you plan to spread manure from calves, heifers, steers or other livestock during the winter. If suitable cropland is not available, you may need a short or long-term manure storage facility.

If you pasture your cows in summer months, you will haul and spread less manure, but you will still need suitable land. Follow the same procedure to determine acreage needs for summertime spreading. Storage may also be needed during the summer when cropland is not available for spreading.

An understanding of daily manure production, spreader capacity and application rates at various tractor speeds will help you to apply manure at desired rates. For solid manure handling systems, we recommend that manure spreaders be calibrated with scales to determine how many tons of manure are actually spread per load. If you need help, county Land Conservation Department, University of Wisconsin-Extension, and Natural Resource Conservation Service (NRCS) staff can put you in touch with trained nutrient management specialists in your area.

* These numbers may be conservative. Per cow manure production rates can vary greatly from herd to herd and should be measured to assure accuracy. Actual herd manure production rates for daily haul systems can be measured by finding the weight of a spreader load (one day’s worth) of manure with portable axle scales.
Summary

The guidelines described provide the basis for developing an economically and environmentally-sound manure-management plan. Some farmers may need long-term or short-term manure storage facilities because their land is not suitable for winter manure applications. However, many farmers will be able to follow these guidelines without changing manure storage and handling practices. Proper manure management benefits both the farmer and the environment.
Basic Guidelines for Land Application of Manure in Wisconsin

Incorporate Manure Whenever Possible

- Inject or work into the soil within 3 days of application.
- If not incorporated through injection or tillage, do not apply more than 25 tons/a of solid dairy manure (or an amount of manure with the same amount of available phosphorus—75 lbs P$_2$O$_5$/a) in any 1 year period.
- On no-till fields and other areas that are not tilled, do not apply more than 25 tons/a of solid dairy manure (or an amount of manure with the same amount of available phosphorus—75 lbs P$_2$O$_5$/a) in any 5 year period.

Know Crop Nutrient Requirements

- Soil test fields every 3 to 4 years.

Credit Manure-Nitrogen to Avoid Over-Application of Nitrogen

- Apply manure at rates sufficient to meet crop nitrogen requirements.
- Take all N sources into account, including legume-N, when planning applications to avoid exceeding crop needs.

Avoid Fields With High Phosphorus Levels

- If soil-test phosphorus levels reach 75 ppm (150 lbs/a) — plant phosphorus-demanding crops such as alfalfa, use appropriate runoff reduction practices, and reduce manure application rates. On muck and sandy soils, soil-test phosphorus levels may reach 120 ppm (240 lbs/a) before phosphorus-reduction practices are warranted.
If soil test phosphorus levels reach 150 ppm (300 lbs/a) — stop applying manure if possible and use additional runoff reduction practices. On muck and sandy soils, soil-test phosphorus levels may reach 240 ppm (480 lbs/a) before manure applications should be stopped.

### Avoid Applications that Will Lead to Nitrate-Nitrogen Leaching to Groundwater

- In the autumn, do not apply manure to sands or loamy sands until after October 31 unless a cover crop will be established. If a nitrification inhibitor is used, manure can be applied after mid-September.
- If there are less than 10 inches of soil over bedrock, do not apply manure.
- If there are only 10 to 20 inches of soil over bedrock, do not apply manure unless it can be incorporated within 3 days, do not apply more than 25 tons/a dairy manure (or other manure with more than 100 lbs of available N/a), and, in the autumn, do not apply until after October 31 unless a nitrification inhibitor is used.

### Avoid Applications Where Manure Can Be Washed Directly to Surface Waters

- Do not apply manure to land with wet soils that are periodically flooded (areas within the 10-year flood plain), within 300 feet of streams, or within 1000 feet of lakes unless you can incorporate it within 3 days.
- Do not apply manure to grassed waterways, terrace channels, open surface drains, or anywhere else that water flow concentrates.
- When soils are frozen, do not apply manure to fields with greater than 12% slope. If manure is applied to frozen fields with 6-12% slopes, conservation measures must be in place.
Plan Manure Applications to Make Sure Suitable Land Is Available

Areas suitable for spreading in winter (when the ground is frozen):
- Fields greater than 300 feet from streams or 1000 feet from lakes.
- Fields with more than 20 inches of soil over bedrock.
- Fields with less than 6 % slopes.
- Fields with 6-12 % slopes if conservation practices are in place.

Areas suitable for spreading in the fall (before October 31):
- Fields with medium to fine-textured soils (not sands or loamy sands).
- Fields with more than 20 inches of soil over bedrock.

Areas that are not suitable for spreading unless the manure will be worked into the soil within 3 days:
- Fields within 300 feet of streams or 1000 feet of lakes.
- Fields with soil that is only 10 inches to 20 inches thick over bedrock.

Areas that are never suitable for spreading manure:
- Land that is wet or frequently flooded (within the 10-year flood plain).
- Grassed waterways, terrace channels, open surface drains or other areas where water flow may concentrate.
- Land with less than 10 inches of soil over bedrock.
Exhibit 16
Minnesota Center For Environmental Advocacy (“MCEA”)

Comments and Petition for a Contested Case Hearing

on

The Draft National Pollutant Discharge Elimination System (“NPDES”) Permit

for the expansion proposed at the

Daley Farms of Lewiston, LLC operation in Winona County

November 15, 2018

SUMMARY

The Minnesota Pollution Control Agency (“MPCA”) proposes to issue an National Pollutant Discharge Elimination System/State Disposal System permit (“NPDES permit”) authorizing a significant expansion of the Daley Farms of Lewiston LLC dairy operation in Winona County (“Daley Expansion”). Based on the existing record, MPCA cannot issue this permit because the project has not identified enough competent land that could receive the volumes of manure that will be produced by the expanded facility. The land that has been identified for application is pocked with karst features that will convey manure directly to ground and surface waters. As a result, MPCA cannot conclude that the project as proposed will comply with the requirements of the Clean Water Act and state law. The project as proposed would instead further endanger public health in an area that is already experiencing health impacts from contaminated drinking water. Petitioners therefore request that the MPCA deny the NPDES permit for the Daley Expansion. If the agency does not deny the application, Petitioners request
that the agency refer the disputed issues of material fact to the Office of Administrative Hearings for resolution in a contested case hearing.

I. TIMELINESS

This comment and request for a contested case hearing is timely. MPCA published the Public Notice of the intent to issue an NPDES permit for the Daley Expansion on October 1, 2018, and extended the comment period until November 15, 2018 at the request of Petitioners and others, due to the fact that this comment period coincided with harvesting, and because of the complexity of the project. The petition for a contested case is timely pursuant to Minn. R. 7000.1800, which provides that a petition for a contested case hearing “must be submitted during the public comment period established under parts 7001.0100.”

II. STATEMENT OF INTEREST

MCEA is a Minnesota nonprofit public interest organization with over 3,000 members including many in Winona County. MCEA’s mission is to use law, science, and research to protect and enhance Minnesota’s natural resources, wildlife, and the health of its people. MCEA has advocated for sustainable agriculture for many years, and was integrally involved in the feedlot rule amendments implemented in the early 2000s.

III. APPLICABLE LEGAL STANDARDS

Before issuing an NPDES Permit, MPCA must make the following finding:

Except as provided in subpart 2, the agency shall issue, reissue, revoke and reissue, or modify a permit if the agency determines that the proposed permittee or permittees will, with respect to the facility or activity to be permitted, comply or will undertake a schedule of compliance to achieve compliance with all applicable state and federal pollution control statutes and rules administered by the agency, and conditions of the permit and that all applicable requirements of
Similarly, the MPCA can refuse to issue the Permit if it finds:

A. that with respect to the facility or activity to be permitted, the proposed permittee or permittees will not comply with all applicable state and federal pollution control statutes and rules administered by the agency, or conditions of the permit;

C. that the permittee has failed to disclose fully all facts relevant to the facility or activity to be permitted, or that the permittee has submitted false or misleading information to the agency or to the commissioner;

D. that the permitted facility or activity endangers human health or the environment and that the danger cannot be removed by a modification of the conditions of the permit;

In issuing an NPDES/SDS permit, MPCA must ensure that the permit contains “conditions necessary for the permittee to achieve compliance with all Minnesota or federal statutes or rules.” The Commissioner is required to establish “effluent limitations, standards, or prohibitions for each pollutant to be discharged from each outfall or discharge point of the permitted facility.”

Below, Petitioners set forth the detailed reasons why the Permit does not meet the standards set forth above.

IV. THE DRAFT PERMIT DOES NOT MEET THE REQUIREMENTS OF THE CLEAN WATER ACT AND STATE LAW

A. Clean Water Act

The Clean Water Act prohibits the discharge of pollutants to waters of the United States without a NPDES permit. In Minnesota, MPCA administers the NPDES permit program by

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1 Minn. R. 7001.0140, subp. 1. In separate comments, MCEA also asserts that, under the conditions in Minn. R. 4410.1700, MPCA should order an EIS.
2 Id., subp. 2.
3 Minn. R. 7001.1080, subp. 1.
4 Id., subp. 2.
5 33 U.S.C. §§ 1311(a), 1342(a).
issuing permits that comply with or are more stringent than federal permit requirements, to persons seeking to discharge pollutants into waters within Minnesota. The CWA requires that all NPDES permits for point sources contain technology based effluent limits and any more stringent limits necessary to meet water quality standards. The limits necessary to meet water quality standards – commonly referred to as water quality based effluent limits or WQBELs – must control all pollutants that “are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an in-stream excursion above any State water quality standard.” MPCA must ensure that “the level of water quality to be achieved by limits on point sources … is derived from and complies with all applicable water quality standards.” In other words, MPCA must limit point source discharges as “necessary to keep the concentration of a pollutant in a waterway at or below the numeric benchmark.”

New sources and new dischargers, such as the Daley Expansion, are subject to more stringent controls, particularly where the new source or new discharger will contribute pollutants to an already impaired water. No permit may be issued to a new source or new discharger if a

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6 Minn. Stat. § 115.03; 40 C.F.R. § 123.25(a); 33 U.S.C. § 1342.
8 40 C.F.R. 122.44(d)(1)(i).
9 The Clean Water Act made it the national goal to eliminate all discharges of pollutants to waters by 1985, with an interim goal that water quality supports both fish and aquatic life and all recreational uses by July 1, 1983. 33 U.S.C. § 1251(a). Under the Clean Water Act, each state is charged with establishing the water quality goals and uses of waters within its borders. See 40 C.F.R. § 131.(4)a. These so called “water quality standards” establish both the uses of waterways—such as for fishing or recreation—and the maximum allowable concentration of pollutants that may be present in a waterbody to ensure the designated uses will be met. See 40 C.F.R. § 131.5 (establishing the criteria for EPA approval of water quality standards, one of which being that the standards “protect the designated water uses”).
10 40 C.F.R. § 122.44(d)(vii)(A).
11 In re Alexandria Lake Area Sanitary Dist. NPDES/SDS Permit No. MN0040738, 763 N.W.2d 303, 309 (Minn. 2009) (quoting Am. Paper Inst., Inc. v. EPA, 996 F.2d 346, 350 (D.C. Cir. 1993)).
12 40 C.F.R. 122.29(a).
discharge from construction or operation will cause or contribute to a violation of water quality standards.\textsuperscript{13} However, a new source or new discharge may be permitted in situations where a pollutant load allocation has been performed and the permittee has demonstrated, before the close of the public comment period, that there are sufficient remaining pollutant load allocations to allow for the discharge (and the existing discharges are subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards).\textsuperscript{14}

\textbf{B. Effluent Limits For CAFOs}

A Concentrated Animal Feeding Operation (\textquotedblleft CAFO\textquotedblright), like all other NPDES permitted facilities, is subject to both technology based effluent limits and more stringent water quality based effluent limits needed to meet water quality standards for the types of pollutants discharged from the facility. The NPDES requirements for CAFOs apply with respect to all animals in confinement at the operation and all manure, litter, and process wastewater generated by those animals or the production of those animals.\textsuperscript{15} Land application discharges from a CAFO are also subject to NPDES requirements.\textsuperscript{16}

As a large CAFO subject to NPDES permitting requirements, the Daley Expansion must comply with federal technology based effluent limits, including Best Management Practices that include, among other things:

- A nutrient management plan (\textquotedblleft NMP\textquotedblright)\textsuperscript{17} \textquotedblleft based on a field-specific assessment of the potential for nitrogen and phosphorus transport from the field and that addresses the form, source, amount, timing, and method of application of nutrients on each field to achieve realistic production goals, while minimizing nitrogen and phosphorus movement to surface waters;\textquotedblright

\begin{itemize}
  \item \textsuperscript{13} 40 C.F.R. § 122.4(i).
  \item \textsuperscript{14} Id.
  \item \textsuperscript{15} 40 C.F.R. § 122.23(a).
  \item \textsuperscript{16} 40 C.F.R. § 122.23(e); Minn. R. ch. 7020.
  \item \textsuperscript{17} The document known as a \textquotedblleft nutrient management plan\textquotedblright under the federal rules is referred to as a \textquotedblleft manure management plan\textquotedblright under state rules. Minn. R. 7020.2225, subp. 4.
\end{itemize}
• Application rates that minimize phosphorus and nitrogen transport from the field to surface waters in compliance with the technical standards for nutrient management;

• Manure and soil sampling;

• A prohibition on applying manure closer than 100 feet of surface waters, open tile line intakes, sinkholes, agricultural well heads, or other conduits to surface waters or a 35-foot vegetated buffer that receives no manure.\(^{18}\)

A nutrient management plan that meets the standards established in federal law is a mandatory prerequisite for a CAFO seeking coverage under an NPDES permit.\(^{19}\) Specifically, the NMP must:

“(vi) Identify appropriate site specific conservation practices to be implemented, including as appropriate buffers or equivalent practices, to control runoff of pollutants to waters of the United States;

...  
(viii) Establish protocols to land apply manure, litter or process wastewater in accordance with site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrient in the manure, litter or process wastewater.”\(^{20}\)

It is of the utmost importance that either the NMP definitively prevents any pollutants from reaching surface waters at levels that contribute to a violation of water quality standards or that the NPDES permit contains additional conditions that do so. This is because federal law exempts from NPDES permit requirements any agricultural stormwater discharges that occur despite application of manure in accordance with an NMP.\(^{21,22}\) However, the agricultural stormwater exemption does not exempt all discharges from land application areas: precipitation related discharges are exempted agricultural stormwater discharges only where “the CAFO has applied the manure in accordance with nutrient management practices that ensure ‘appropriate

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\(^{18}\) 40 C.F.R. § 412.4(c)1.
\(^{19}\) 40 C.F.R. § 122.42(e)1.
\(^{20}\) Id. See also Minn. R. 7020.2225.
\(^{21}\) 33 U.S.C.§ 1362(14); 40 C.F.R. § 122.23(e).
\(^{22}\) This same exemption does not exist in state law, see Minn. R. 7001.1030.
agricultural utilization’ of the manure, litter, or process wastewater nutrients.” 23 “[W]hile the statute does include an exception for ‘agricultural stormwater discharges’ there can be no escape from liability for agricultural pollution simply because it occurs on rainy days.” 24 Minnesota State rules simply prohibit the application of manure and process wastewater in a manner that will “result in a discharge to waters of the state during the application process” or “cause pollution of waters of the state due to manure-contaminated runoff.” 25

By themselves, NMPs are not sufficient to ensure public health, nor are they intended to, and therefore water quality based effluent limits may be necessary to protect the public health. 26 Water quality based effluent limits may also be necessary, in addition to the NMP, to prevent a facility from contributing to a violation of water quality standards. 27 In particular, water quality effluent limits may be needed to meet water quality standards for nitrate or pathogens, such as E. coli and fecal coliform, channeled to surface water overland or via other conduits such as sinkholes, fissures, fractured bedrock, or drain tile. 28 For example, compliance with EPA’s technology based limits will not eliminate the discharge of pathogens from land spreading activities, although the limit could reduce pathogens by about 46% from baseline levels. 29 And the manure application setback requirements in Minn. R. ch. 7020 are based on research related

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24 Concerned Area Residents for Env’t v. Southview Farms, 34 F.3d 114, 120 (2nd Cir. 1994).
25 Minn. R. 7020.2225.
26 Waterkeeper All., Inc. v. U.S. E.P.A., 399 F.3d 486, 519 (2nd Cir. 2005).
27 74 Fed. Reg. at 70458.
29 73 Fed. Reg. 70,418-01; see also Chapter 12 of “Development Document for the Final Revisions to the NPDES and the Effluent Guidelines for CAFOs” EPA-821-R-03-001. See also 68 Fed. Reg. 7176, 7197-98 (the primary role of applying at agricultural rates is to control the runoff of nutrients, not the discharge of pathogens.)
to phosphorus transport, not bacterial transport, and the effectiveness of these current setbacks on bacterial transport to surface waters is not known.\textsuperscript{30}

In addition, discharges that reach surface water via overland runoff, sinkholes, fractured bedrock, fissures, drain tile, and other conduits can be discharges from a point source regardless of whether they are found on land application areas controlled by the facility or found on land application areas for transferred manure. Under federal law, the “collection of liquid manure into tankers and their discharge on fields from which the manure directly flows into navigable waters are point source discharges. . .”\textsuperscript{31} Under state law, sinkholes, discrete fissures, drain tile, and other conduits are by definition point sources that must be permitted irrespective of whether it is agricultural stormwater or another source of pollutants that flows through these conduits and fissures.\textsuperscript{32,33} Therefore, conditions sufficient to prevent these point source discharges of pollution from contributing to a violation of water quality standards are required by law.\textsuperscript{34}

\textsuperscript{30} Mississippi River – Winona Watershed Pollutant Reduction Project (Total Maximum Daily Load Study) for Nutrients, Sediment and Bacteria at 51-52.
\textsuperscript{31} Concerned Area Residents for Env’t v. Southview Farm, 34 F.3d 114, 119 (2nd Cir. 1994).
\textsuperscript{32} According to state law, point sources are “any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.” Minn. Stat. § 115.01, subd. 11. A "Drainage system" is a “system of ditch or tile, or both, to drain property, including laterals, improvements, and improvements of outlets, established and constructed by a drainage authority.” Minn. Stat. § 103E.005, subd. 12. A “sinkhole” is a “surface depression caused by a collapse of soil or overlying formation above fractured or cavernous bedrock. Minn. R. 7020.0300, subp. 22.
\textsuperscript{33} State law, which may be more stringent than the federal Clean Water Act, does not contain the agricultural stormwater exemption. Minn. R. 7001.0130. “Because the exemption is not incorporated by reference in state-administered NPDES programs, which may be more stringent than the EPA regulations, and because Minnesota’s NPDES program does not have its own [exemption], the federal [exemption] does not apply in Minnesota.” West McDonald Lake Association v. Minnesota Department of Natural Resources, 899 N.W.2d 832, 842-843 (Minn. Ct. App. 2017); see also, 40 C.F.R. § 123.25; Minn. Stat. § 115.03, subd. 5.
C. MPCA Has A Duty To Regulate Agricultural Nonpoint Sources Of Pollution

The federal Clean Water Act creates the primary authority for permitting point source discharges of pollution, but the Act places primary responsibility for the control of nonpoint sources on states, such as Minnesota. Specifically MPCA has the authority and duty to control nonpoint sources of pollution, including those nonpoint sources from agricultural operations:

The agency is hereby given and charged with the following powers and duties:

\[\text{(e) to adopt, issue, reissue, modify, deny, or revoke, enter into or enforce reasonable orders, permits, variances, standards, rules, schedules of compliance, and stipulation agreements, under such conditions as it may prescribe, in order to prevent, control or abate water pollution, or for the installation or operation of disposal systems or parts thereof, or for other equipment and facilities:}

\(\begin{align*}
\text{(1) requiring the discontinuance of the discharge of sewage, industrial waste or other wastes into any waters of the state resulting in pollution in excess of the applicable pollution standard established under this chapter…} \\
\text{\textit{36}}
\end{align*}\]

The statute explicitly includes agricultural sources in its definition of “other waste”:

"Other wastes" mean garbage, municipal refuse, decayed wood, sawdust, shavings, bark, lime, sand, ashes, offal, oil, tar, chemicals, dredged spoil, solid waste, incinerator residue, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, cellar dirt or municipal or agricultural waste, and all other substances not included within the definitions of sewage and industrial waste set forth in this chapter which may pollute or tend to pollute the waters of the state.37

The Legislature plainly provided the MPCA with both the authority and the duty to regulate agricultural sources of pollution to the state’s waters.

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36 Minn. Stat. § 115.03, subd. 1 (emphasis added).
37 Minn. Stat. § 115.01, subd. 9 (emphasis added).
D. **The Area Where Daley Farms Proposed To Land Apply Liquid Manure Is Highly Susceptible To Pollution Due To Karst Features And Sinkholes.**

The record in this matter demonstrates that the sites where Daley Farms intends to apply the liquid manure generated from its proposed expansion are replete with karst features, including sinkholes and disappearing streams and the like. Moreover, these areas are likely to develop additional sinkholes.\(^{38}\) Groundwater under such areas is susceptible to pollution.\(^{39}\)

E. **The Land Application Practices Allowed Under The Permit Will Result In Discharges To Waters Of The U.S. In Violation Of The Clean Water Act And State Law.**

The terms of the draft permit are insufficient to prevent pollutants contained in land-applied liquid manure originating from the Daley Expansion from contaminating surface waters. The draft permit prohibits “the discharge of manure and manure contaminated runoff from a land application area, except where the discharge is an agricultural storm water discharge.”\(^{40}\) The agricultural stormwater exemption is broad, and includes any precipitation-related discharges of manure from land areas under the CAFO’s control if the manure has been applied in accordance with an MMP that ensures appropriate agricultural utilization of the nutrients in the manure.\(^{41}\) Thus, by allowing an “agricultural storm water discharge,” the draft permit is not sufficient to protect water quality because it is not designed to prevent discharges of nitrate, phosphorus and *E. coli* from reaching surface waters.

The draft permit fails to ensure that the discharging facility is not generating pollution that will cause or contribute to a violation of water quality standards in two ways. First, the

\(^{38}\) See https://conservancy.umn.edu/bitstream/handle/11299/58435/winona_plt5_sinkholes%5b1%5d.pdf?sequence=5&isAllowed=y
\(^{39}\) See https://conservancy.umn.edu/bitstream/handle/11299/58435/winona_plt6_gwsuscept%5b1%5d.pdf?sequence=4&isAllowed=y
\(^{40}\) Draft Permit at 44, Section 13.3.
\(^{41}\) *Id.* at 43.
permit restrictions do not appear to prevent the discharge of pollutants from land spreading of manure that occurs on land that is outside the facility’s control. MPCA has the duty to ensure these pollutants are not causing exceedances of water quality standards in surface waters, or contributing pollutants such as nitrates and bacteria in excess of a load allocation in a TMDL. Although rules apply to transferred manure, the MPCA does not directly inspect or regulate these applications.\textsuperscript{42} This is important considering that Daley Expansion will cause an estimated 19 million gallons of manure to be spread on land outside its control.\textsuperscript{43}

Second, the permit will not prevent discharges of pollution that occur even when the facility is applying manure according to its manure management plan. The agronomic rates utilized in the facility’s manure management plan are not intended to prevent the addition of nutrients to surface water or groundwater. These rates are calculated based on economics, and vary depending on the ratio of nitrogen costs to corn prices. These rates of application will result in subsurface discharges of nitrogen at levels higher than the health risk limit for nitrogen.\textsuperscript{44}

In addition, there has been no analysis of whether the landspreading of manure will contribute bacteria to waters of the United States which are already significantly contaminated by excess bacteria in the area where Daley Farms operates and where its manure will be applied. Compliance with EPA’s technology based limits will not eliminate the discharge of pathogens from manure application activities, although in some circumstances those limits could reduce pathogens by 46\% from baseline levels.\textsuperscript{45} There has been no analysis of whether this reduction

\textsuperscript{42} Minn. R. 7020.2225, subp. 1, item D.
\textsuperscript{43} Daley Farms Lewiston, LLC, NPDES Permit Application Materials, at 1061 of 1090.
\textsuperscript{44} Report of Dr. Gyles Randall’s Review of Portions of the Daley LLP Proposed Dairy Expansion, attached as Exhibit (Ex”) 1; Best Management Practices for Nitrogen Use in Southeastern Minnesota, University of Minnesota Extension, at Table 2.
\textsuperscript{45} 73 Fed. Reg. 70,418-01; see also Chapter 12 of “Development Document for the Final Revisions to the NPDES and the Effluent Guidelines for CAFOs” EPA-821-R-03-001; see also,
can be expected in areas where karst topography and sinkholes are ubiquitous. Additionally, the manure application setback requirements in Minn. R. ch. 7020 are based on research related to phosphorus transport, and not bacterial transport, and the effectiveness of these current setbacks on bacterial transport to surface waters is not known.46

The MMP, as drafted, clearly fails to control pollutants from reaching ground and surface water at land application sites. The application of manure from the Daley Expansion is likely to result in contamination of surface water given the karst geology of fissures, sinkholes, fractured bedrock and other conduits in the region where the facility is located and intends to land apply manure. This pollution will either happen directly on Daley Farms land, or after the manure is transferred to other individuals in the community.

These anticipated discharges will reach surface water either via overland runoff or via hydrologically connected groundwater and will contribute to a violation of water quality standards. The draft NPDES permit for Daley Farms does nothing to prevent this violation of the Clean Water Act and state law.

**F. The Land Application Practices Allowed Under The Permit Will Result In Subsurface Discharges Of Manure To Groundwater**

The Draft Permit Section 13.4 states:

The Permittee shall not discharge from the facility, by overflow or other means, manure, manure-contaminated runoff, or process wastewater to a sinkhole, fractured bedrock, well, surface tile intake, mine, quarry, or other natural or constructed channels that convey fluids to groundwater.

68 Fed. Reg. 7176, 7197-98 (the primary role of applying at agricultural rates is to control the runoff of nutrients, not the discharge of pathogens.)

46 Mississippi River – Winona Watershed Pollutant Reduction Project (Total Maximum Daily Load Study) for Nutrients, Sediment and Bacteria at 51-52.
The “leaky” nature of the karst topography underlying Daley Farms and surrounding areas, coupled with information provided in Dr. Randall’s attached report, demonstrates that MPCA does not have a factual basis for concluding that the Daley Expansion could comply with this prohibition. In this area—where current agricultural practices are already causing significant groundwater contamination—it is beyond reason to conclude that that spreading many million gallons more of liquid manure will not intensify the problem. MPCA has not shown that the additional liquid manure will not increase nitrogen or *E. coli* in the groundwater.

In addition, there has been no analysis of whether the landspreading of liquid manure will contribute bacteria to waters of the state, including groundwater that is the source of drinking water for a significant number of individuals and families living in Winona County.

There are numerous pathways for land-applied liquid manure to reach ground and surface waters in this region via fissures, conduits, fractured bedrock, and sinkholes. In addition, Dr. Randall’s report identifies other additional pathways for subsurface discharges. Over-applying nutrients in excess of agricultural utilization to incompatible sites (very high STP levels, sloping soils, shallow soils, numerous setbacks) will lead to significant environmental concerns. Specifically, the Daley Expansion will “result in excess levels of nitrate available for leaching to ground water,” with a risk of “significant and unacceptable surface water contamination (sediment, manure, and pathogens) or ground water pollution.”

Because the project cannot comply with the effluent limitations on subsurface discharges, the project is ineligible for permit coverage.

G. The Permit Will Allow Application Of Manure At Rates That Exceed Agricultural Utilization Of Nutrients

It is a certainty that the project as proposed will apply liquid manure to croplands in excess of agricultural utilization of nutrients, for two primary reasons. First, the proposal uses clearly erroneous maximum nitrogen application rates to estimate the acres needed. Second, many of the acres the MMP identifies for landspraying manure are unsuitable for land application due to setbacks, soil depth, and soil characteristics that render the land ineligible for land application. Uniform pattern application of liquid manure will be very difficult on many of the manure application sites identified in the MMP. In other words, the project does not have enough acres to apply the 46 million gallons of manure it will generate, and even less of the application acreage will be available for manure spreading than the proposal assumes. Dr. Randall in fact seriously questions “whether there are enough acceptable soils in this proposal to receive the manure produced from this dairy expansion project without significant and unacceptable surface water contamination (sediment, manure, and pathogen) or groundwater pollution (nitrate-nitrogen).”48 As a result, the project will apply far more manure than can be utilized by crops, causing contamination of ground and surface waters; violating 40 C.F.R. § 412.4(c), 40 C.F.R. § 122.42(e) and Minn. R. 7020.2225, subp. 3; and rendering the project ineligible for coverage under the permit for the following reasons:

- The project’s MMP states that manure will be applied on land under Daley Farm’s control at rates ranging from 3,000 to 20,000 gallons/acre.49 The MMP estimates the nutrient content of the liquid manure at either 13.18, or 31 lbs. nitrogen per 1,000 gallons, but Dr. Randall questions how the nutrient in previous year’s manure of 13 lbs. per gallon can be 58% lower than the Book value of 31 lbs. per 1000 gallons.50
- As Dr. Randall explains, the recommended N rate used in the Daley Farms EAW is based on outdated recommendations of 180 lbs. N/acre for corn after corn and 140

48 Id.
49 Daley Farms of Lewiston, LLC Nutrient Application Planning Worksheet.
50 Daley Farms of Lewiston, LLC Crop and Nutrient Planning Worksheet.
lbs. N per acre for corn following soybean. This is an excessive amount of nitrogen application, and far more than can be utilized by crops. Dr. Randall explains in his attached report that the Maximum Return to Nitrogen ("MRTN") rate is much lower: 123 lbs. nitrogen per acre for corn after soybeans and 159 lbs. per acre for corn after corn.51 Even then, we know that MRTN is not intended to protect groundwater, is based on the maximum economic return to the farmer, and will result in nitrate levels in groundwater above the health risk limit.52

- The proposal would also apply phosphorus at rates excessive to agricultural needs. Dr. Randall concludes that manure applications on fields with very high soil test phosphorus, as Daley Farm’s proposes, are a “significant environmental concern to surface waters.”53 And scenario #1 in the 6-year soil phosphorus management plan would result in excessive nitrate.54

- There are many characteristics of a crop field that render it ineligible for land application of manure, due to sloping soils, shallow soils, and numerous setbacks. As Dr. Randall observes, 10 identified manure application sites are identified as “poor” based on in-field characteristics including dominant soil types, slopes, topography, shallow soils to bedrock, Karst features, setbacks and water courses.

- Some of the soils at the application sites have slopes of 7-20% “that are more conducive to soil erosion, especially in the knifed-in manure strips that lead up and down the hill slopes.”55 At those sites significant erosion can occur “leading to pollution of surface waters.”56 In addition, the shallow soils found at many application sites “limit crop yields and enhance nitrate loss to groundwater.”

Dr. Randall ultimately concluded, “[b]etween site characteristics of the designated MAS including very high STP levels, sloping soils, shallow soils, numerous setbacks, and the improper N recommendations being used in the EAW, I am very concerned about the success of the proposed dairy expansion project. The large amount of manure being produced appears to require more ‘manure friendly’ land area than has been designated in the 42/44 MAS, unless

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51 Dr. Gyles Randall, Review of Portions of the Daley LLP Proposed Airy Expansion, November 11, 2018, attached as Exhibit 1.
52 Dr. Gyles Randall, Nitrogen BMP’s for Corn in Minnesota, attached as Exhibit 2.
53 Id.
54 Id.
55 Id.
56 Id.
manure is applied to the strongly sloping and shallow soils, which will lead to significant environmental concerns.”

H. The Permit Lacks Conditions Sufficient To Meet Water Quality Standards.

The Daley permit does not contain conditions sufficient to prevent pollution of groundwater and surface water. Federal law requires MPCA to impose effluent limitations necessary to protect the receiving water and achieve water quality standards. No permit may be issued by the MPCA “[w]hen the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States.” Further regulations stipulate that:

. . .each NPDES permit shall include conditions meeting the following requirements when applicable.

. . .(d) Water quality standards and State requirements: any requirements in addition to or more stringent than promulgated effluent limitations guidelines or standards under sections 301, 304, 306, 307, 318 and 405 of CWA necessary to:

(1) Achieve water quality standards established under section 303 of the CWA, including state narrative criteria for water quality.

   (i) Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.

Water quality based effluent limits (“WQBELs”) “shall ensure that… [t]he level of water quality to be achieved by limits on point sources … is derived from, and complies with all applicable water quality standards.”

The threshold for inclusion of water quality based effluent limits is low: limits are necessary when a pollutant “may be discharged at a level which will cause, have a reasonable

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57 Id.
59 40 C.F.R. § 122.4(d).
60 40 C.F.R. § 122.44.
potential to cause, or contribute to an excursion above State water quality criteria regardless of whether the water is listed on a state’s 303(d) impaired waters list. Even if a water body is not currently impaired, a permit writer must include a WQBEL if a discharge has the reasonable potential to cause or contribute to an excursion of applicable standards.

As explained more fully above, and in the attached expert reports of Dr. Randall, land spreading of manure from the facility will cause or contribute to violation of surface water quality standards in the already severely polluted area streams. The conditions in the Daley permit neither meet the standards of the Clean Water Act and state law, nor are they capable of preventing pollution from the facility from entering surface and groundwater.


Rivers and streams with levels of nitrate and E. coli (or fecal coliform) pollution that exceed Minnesota’s established water quality standards are unsafe for fishing or swimming, and MPCA may not authorize activities that increase pollution to these waters.

The Clean Water Act prohibits the Daley Expansion from discharging E. coli and nitrate to impaired streams in the watershed unless, or until, a concrete plan is being implemented to bring the waters into compliance with water quality standards. The Clean Water Act prevents issuance of a NPDES permit:

(i) To a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards. The owner or operator of a new source or new discharger proposing to discharge into a water segment which does not meet applicable water quality standards or is not expected to meet those standards even after the application of the effluent limitations required by sections 301(b)(1)(A) and 301(b)(1)(B) of CWA, and for

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63 City of Taunton, at *39.
which the State or interstate agency has performed a pollutants load allocation for
the pollutant to be discharged, must demonstrate, before the close of the public
comment period, that:

(1) There are sufficient remaining pollutant load allocations to allow for the
discharge; and

(2) The existing dischargers into that segment are subject to compliance
schedules designed to bring the segment into compliance with applicable water
quality standards. The Director may waive the submission of information by
the new source or new discharger required by paragraph (i) of this section if
the Director determines that the Director already has adequate information to
evaluate the request. An explanation of the development of limitations to meet
the criteria of this paragraph (i)(2) is to be included in the fact sheet to the
permit under §124.56(b)(1) of this chapter.64

This provision bans new discharges to impaired waters, even those that are offset by claimed
reductions from other sources, unless “a TMDL has been performed and the [permittee]
demonstrates that before the close of the comment period two conditions are met, which will
assure that the impaired waters will be brought into compliance with the applicable water quality
standards.”65 These two conditions require MPCA to show that there is sufficient remaining
pollutant load allocations to allow for the discharge and that the existing dischargers are subject
to “compliance schedules designed to bring the segment into compliance with water quality
standards.”66 In other words the new discharge can only be permitted if it “can demonstrate that,
under the TMDL, the plan is designed to bring the waters into compliance with applicable water
quality standards.”67 There is nothing in the Clean Water Act “that provides an exception for an

64 40 C.F.R. § 122.4(i).
65 Friends of Pinto Creek v. U.S. Envtl. Prot. Agency, 504 F.3d 1007, 1012 (9th Cir. 2007), cert.
denied, 555 U.S. 1097 (2009); see also 33 U.S.C. § 1251; 40 C.F.R. § 122.4(i). Friends of Pinto
Creek interprets federal statutes and regulations that the Minnesota Supreme Court analyzed in
Minn. Center for Environmental Advocacy v. Minn. Pollution Control Agency, 731 N.W.2d 502
(Minn. 2007) and is more authoritative because Minn. Center for Environmental Advocacy relied
on a decision overturned by Friends of Pinto Creek.
66 40 C.F.R. § 122.4(i)(2).
67 Friends of Pinto Creek, 504 F.3d at 1012.
offset when the waters remain impaired and the new source is discharging pollution into that impaired water.”^68

MPCA also may not authorize any activities that will contribute additional nitrate and *E. coli* from nonpoint sources to impaired waters. Impaired waters that could be impacted by the project include reaches of the South Fork of the Whitewater River, Garvin Brook, Peterson Creek, and Rush Creek. These reaches are impaired by bacteria and nitrates, and the applicable TMDLs demand reductions of these pollutants so that the water quality standards can be attained.

The MPCA must consider the following:

- Rush Creek, a trout stream directly impacted by Daley Farm’s land application sites, is so contaminated by bacteria that MPCA has determined the *E. coli* must be *reduced* in the watershed in order to meet water quality standards.\(^69\) To that end, MPCA has adopted a TMDL that specifies that all CAFOs in the watershed upstream of the outlet of the South Fork Root River must have a zero discharge of *E. coli*:

  CAFOs in the RRW were assigned a WLA of 0. Their role as a source of bacteria is discussed in Section 3.6.2.1. By assigning the allowable load to 0, it sets the strictest requirements for CAFOs - i.e., they are not allowed to discharge manure to surface waters, which should not occur in the first place if permit language governing them are properly followed.\(^70\)

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\(^{68}\) *Id.*


\(^{70}\) *Id.* at 81.
In addition, the TMDL makes clear that *E. coli* will continue to exceed water quality standards unless other unregulated agricultural sources of *E. coli*, such as livestock facilities and land application of manure, reduce or eliminate *E. coli* contributions.\(^{71}\)

- Likewise, the trout stream portions of the Whitewater River, South Fork (AUID: 07040003-512) and Garvin Brook (07040003-524) are also impaired by bacteria and the TMDLs for these reaches allocate a “zero” discharge of fecal coliform to the Daley Farms of Lewiston and require reductions from other unregulated agricultural sources of fecal coliform, such as livestock facilities and land application of manure.\(^{72}\)

- The Peterson Creek watershed, which includes acres on which Daley Farms plans to spread manure, is also impaired by bacteria. MPCA estimates that there needs to be an 57% reduction in *E. coli* loading before this creek will meet water quality standards and be suitable for recreation.\(^{73}\)

- Nitrate pollution is also widespread in the watersheds where the Daley Expansion is located and anticipates spreading manure. MPCA has established a TMDL that includes reductions needed to meet nitrate water quality standards for the South Fork of the Whitewater watershed, where Daley Farms is located and intends to spread manure. Under this TMDL, there are zero nitrate allocations for Daley Farms. In addition, the

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\(^{71}\) *Id.* at 78.


TMDL identifies needed reductions from nonpermitted sources such as nitrate leaching loss from agricultural lands where nitrogen fertilizer and manure are land applied.\textsuperscript{74}

- MPCA has identified nitrate as the stressor causing impairment in Rush Creek but has not yet established a TMDL assigning appropriate load allocations and waste load allocations needed to bring the stream into compliance with applicable water quality standards. Therefore, no new discharges of nitrate that will reach these impaired surface waters are authorized.

As noted above, the proposed NPDES permit and manure management plan will likely result in a discharge of nitrate and bacteria to these waters that have no capacity to assimilate additional pollution. The MPCA has not shown, as required by federal law, that there are sufficient pollutant allocations for the Daley Expansion. For this reason, MPCA must deny the Daley Expansion NPDES permit until the facility meets the conditions in 40 C.F.R. § 122.4(i) and the three TMDLs that apply to the Daley Expansion site and areas where manure generated at this facility will be landspread.

V. **THE PROJECT ENDANGERS HUMAN HEALTH AND THE ENVIRONMENT.**

Issuance of the draft NPDES permit is inappropriate because the project’s operations and discharges will create the potential for significant environmental effects. When those effects include threats to the public health that cannot be removed by permit modifications, the permit must be denied.\textsuperscript{75} The current proposal would create just such a risk, and that risk is inherent to the location itself, the large quantity of liquid manure that is proposed to be land applied, and the

\textsuperscript{74} Id. at 2, 94-96.

\textsuperscript{75} Minn. R. 7001.0140, subp. 2.
karst geology underlying Winona County. Simple modifications like acquiring more land application acres will not address the public health threat.

The overapplication of liquid manure and the existence of sinkholes, fractured bedrock, fissures, and other karst features near the proposed site and the land application sites constitute a threat to the public health justifying denial of coverage under the permit.\(^\text{76}\) Nearly every stream or river nearby the Daley Expansion is contaminated by agricultural pollutants including nitrate and bacteria, such as \textit{E. coli} and fecal coliform. In the townships where Daley proposes to land apply 46 million gallons of manure per year, about 40% of private wells that have been tested register above the health risk limit (“HRL”) for nitrate, with some wells testing at over 4 times the safe levels of nitrates.

<table>
<thead>
<tr>
<th>Township</th>
<th>% Private Wells &gt; HRL</th>
<th>Max Nitrate Level Recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utica</td>
<td>46.5%</td>
<td>27.9 mg/L</td>
</tr>
<tr>
<td>Fremont</td>
<td>54.8%</td>
<td>43.8 mg/L</td>
</tr>
<tr>
<td>Saint Charles</td>
<td>34.1%</td>
<td>34.8 mg/L</td>
</tr>
</tbody>
</table>

*the results are based on data collected by the Minnesota Department of Agriculture’s Township Testing Program.

The Daley NPDES permit threatens to further contaminate public drinking water supplies:

- Six of the Daley Expansion’s proposed manure application sites are within the Utica Drinking Water Supply Management Area (“DWSMA”), which is rated “Highly Vulnerable.”\(^\text{77}\)

- The public water supply for Utica, located within 2 miles of the Daley site, is at serious risk and has registered over the nitrate HRL in recent years.

- Bacteria levels are reaching unsafe levels in public water supplies in the area where Daley is located and plans to landspread manure. Between 2011 and 2016, coliform was registered as present in the noncommunity water supplies of Trout Valley Trail in Lewiston; 3 locations in nearby St. Charles: Discount Grocery, Berea Moravian Church,

\(^{76}\) Minn. R. 7001.0140, subp. 2.

\(^{77}\) \textit{See} Map of Manure Application Acres Proposed at Daley Farms & Drinking Water Supply Management Area Vulnerability, attached as Exhibit 3.
and SEMA equipment; and the Whitewater State Park and Wildlife Management Area in Altura.78

There is a reasonable basis to dispute the underlying optimistic assumptions that the project will not apply liquid manure at rates that will contribute pollution to surface water and groundwater and surface water via karst features, fractured bedrock, sinkholes, and sinkholes that will convey manure to groundwater and threaten the public health. The land application sites are within watersheds, which are already contaminated with bacteria, nitrate, and nitrate caused aquatic toxicity.79 The connection between land application of liquid manure and groundwater contamination is established by the evidence already extant.

Finally, Daley Farms is located in an area with “high” sinkhole probability that is also highly susceptible to groundwater pollution.80 The groundwater impacts of a catastrophic manure pit failure would be immediate and severe, and the size of the proposal ensures that this threat cannot be eliminated by permit modifications.

VI. REQUEST FOR A CONTESTED CASE ON DISPUTED ISSUES OF MATERIAL FACT

The Commissioner must grant a petition to hold a contested case hearing if the Commissioner finds that:

A. there is a material issue of fact in dispute concerning the matter pending before the board or commissioner;

B. the board or commissioner has the jurisdiction to make a determination on the disputed material issue of fact; and

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C. there is a reasonable basis underlying the disputed material issue of fact or facts such that the holding of a contested case hearing would allow the introduction of information that would aid the board or commissioner in resolving the disputed facts in making a final decision on the matter.81

Above, Petitioners have set forth the materiality of the issues of fact that are in dispute. Petitioners have further provided the basis underlying the material and disputed issues illustrating that a contested case hearing on the following material issues would aid the Commissioner in making a final decision as to whether MPCA should issue an NPDES permit for the Daley Expansion.

1. The project’s Manure Management Plan (“MMP”) will allow application of manure at rates that exceed agricultural utilization of the nutrients, in violation of 40 C.F.R. § 412.4(c), 40 C.F.R. § 122.42(e) and Minn. R. 7020.2225, subp. 3;

2. The project’s land application practices will apply manure in a manner that will result in subsurface discharges of manure to groundwater, rendering the project ineligible for permit coverage and violating Minn. R. 7020.2003, subp. 1 and 7020.2225;82

3. Whether the MMP—allowed practices of overapplying manure and applying manure to croplands featuring sinkholes and other karst features such as fractured bedrock, fissures, sinkholes and other conduits, have the reasonable potential to cause or contribute to water quality standard exceedances for nitrates and bacteria, rendering the project ineligible for permit coverage and violating 40 C.F.R. § 122.44(d)(1);

81 Minn. R. 7000.1900, subp. 1.
82 Permit at 13.4 (“Permittee shall not discharge from the facility, by overflow or other means, manure, manure-contaminated runoff, or process wastewater to a sinkhole, fractured bedrock, well, surface tile intake, mine quarry, or other natural or constructed channels that convey fluids to groundwater.”).
4. The project’s MMP will result in discharges to waters of the U.S. through hydrologically connected groundwaters, rendering the project ineligible for permit coverage and violating Minn. R. 7020.2003, subp. 2;

5. The MMP’s allowed practices of overapplying manure and applying manure to croplands featuring sinkholes and other karst features will cause or contribute to a violation of water quality standards and for which the state has performed a pollutant load allocation, where the agency has not demonstrated there are sufficient remaining pollutant load allocations to allow for the new discharge, in violation of 40 C.F.R. § 122.4(i) and state law;

6. The MMP endangers human health and the danger cannot be removed by a modification of the conditions of the permit;\(^{83}\)

Petitioners attach expert reports which reference numerous documents that support the issues identified in these Comments and Petition. Petitioners expect to call the following experts as witnesses if the Commissioner agrees to convene a contested case hearing on the issues that Petitioners identified:

- **Dr. Gyles Randall**, Professor Emeritus, University of Minnesota, Department of Soil, Water and Climate. Ph.D., M.S., B.S., Soil Science.

**VII. CONCLUSION**

For the foregoing reasons, issuance of an NPDES Permit would authorize the Daley Expansion to further pollute the surface water and drinking water in Winona County and would be unreasonable and unlawful. Issuance of an NPDES permit authorizing an enormous increase in the amount of manure produced at Daley Farms will result in discharges of nutrients,

\(^{83}\) Minn. R. 7001.0140, subp. 2.
pathogens, and pharmaceuticals to ground and surface waters, in violation of federal and state law. Should the agency decide to issue and NPDES permit for the Daley Expansion, Petitioners assert that the factual disputes concerning material facts critical to the agency’s permit determinations must be referred to the Office of Administrative Hearings for resolution in a contested case hearing.

Respectfully submitted,

/s/ Betsy Lawton

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Attorneys for Minnesota Center for Environmental Advocacy
Review of Portions of the Daley LLP Proposed Dairy Expansion

Gyles Randall, Professor Emeritus, Soil Science
Univ. Minnesota, Southern Research and Outreach Center
Waseca, MN 56093

The following review was based on the Environmental Review Documents found on the Daley Farm LLP Application Materials document placed on the MPCA website on October 2, 2018.

**Land Application and Nutrient Management:** Land application of manure is a highly significant economic and environmental portion of this project. Forty two field sites were identified as Manure Application Sites (MAS) to receive land-applied manure each year. The Daley’s own 31 sites and have written or verbal agreements with the other 11 sites. Three of the sites are located about 6-8 miles southeast and south of interstate I 90. Karst features including sink holes are found within or near 20 of the MSA. On 27 of the sites Daley will need to use specific field practices to reduce the likelihood of nitrates leaching to the ground water. Many of the sites were not uniform in size or shape, but were very chopped up with setbacks, Karst features, water wells, water courses including grass water ways and intermittent streams. Custom manure applicators prefer to apply manure in a pattern where they go back and forth from end to end working their way either to the right or to the left across the field. This pattern provides the most uniform application where all areas receive manure and skips are rare. Uniform pattern application will be very difficult on many of these designated MAS.

The silt loam soils found at all of the MAS are excellent for manure application and are highly productive. The Port Byron soil type, a dominant soil at many of these MAS, is arguably the best, most highly productive soil in the state. Steep slopes within these soil types can be a very limiting factor in terms of soil erosion and even crop yield. Sometimes the soils are very shallow to bedrock, which limits crop yields and enhances nitrate loss to ground water.

Each of the 44 MAS (two original MAS were split into two parts making a total of 44 MAS) were evaluated for in-field characteristics including dominant soil types, slopes, topography, shallow soils to bedrock, Karst features, setbacks and water courses. Conditions surrounding each field such as residences and sink holes along with soil test phosphorus (P) were not included in the evaluation. Each MAS was then given a rating: Good, OK with extra application care needed, and Poor. There were 20 Good sites, 14 OK sites and 10 Poor sites. The three sites in the Lewiston DWSMA were all rated Good while the Utica DWSMA had 3 Good sites, 3 OK sites, and 1 Poor site. The ratings were primarily based on soil type, slope, and depth to bedrock (shallow soils).

Many of the Poor sites contained soils with slopes ranging from 7 to 20% and/or significant areas of shallow soils to bedrock. Slopes over 6% are more conducive to soil erosion, especially in the knifed-in manure strips that lead up and down the hill slopes. In the spring with snow melt and rainfall, significant erosion can occur, leading to pollution of surface waters. Shallow
soils often have insufficient stored available water, leading to poor crop yields and inefficient use of the manure causing excess levels of nitrate available for leaching to ground water.

These findings lead one to seriously question whether there are enough acceptable soils in this proposal to receive the manure produced from this dairy expansion project without significant and unacceptable surface water contamination (sediment, manure, and pathogens) or ground water pollution (nitrate- nitrogen).

**Nutrient Management:** Issues of concern are listed below:

1) Page 311, Table A, Fertilizer Recommendations for Agronomic Crops in Minnesota is a 2001 publication. There have been numerous updates since 2001. For nitrogen, the Corn N Rate Calculator has been in use since 2006 and is the preferred method for obtaining N recommendations for corn after corn and after soybeans. The N rate recommendations for corn following alfalfa have also been changed since those used in this document. The recommended N rate used in this EAW for corn after corn is 180 lb N/acre and following soybeans is 140 lb N/acre. The Corn N Rate Calculator gives maximum rate of economic return (MRTN) N rates for corn after corn as 159 lb N/acre and after soybeans as 123 lb N/acre. The N rate recommendations in this EAW should be updated to be consistent with the present time.

2) The Bray P soil tests of these MAS are very high (page 410). A Bray soil test P (STP) of 21ppm or more is considered to be **very high** in Minnesota. The STP values from the hundreds of samples shown in the EAW document range from 11 ppm to 282 ppm. Twenty four soil samples tested >100 ppm. Only two MAS tested < very high – Lappiers and Orlies, both south of interstate I 90. All others were >25 ppm or very high. The three 2018 tests ranged from 93 to 136 ppm. These very high STP levels may pose a challenge to meet the goals of the MMP. Moreover, these very high levels of STP are a significant environmental concern to surface waters if there is runoff or erosion from these sites. Thus, the concern with applying manure to the MAS that have considerable areas with >6% slopes.

3) On page 158, why is 15,000 gal/acre being recommended for silage corn and 14,000 gal/acre for corn grain? I do not see a reason for this difference.

4) Why is the TKN of last year’s manure 58% lower (13 lb/1000 gal) than the Book value of 31 lb/1000 gal? Is this low amount of TKN typical of sand-based, open-pit, lagoon manure? Additional TKN tests providing an accurate summary of N content are critical for this project? For instance, the acreage needed for 26 lb TKN/1000 gal manure is twice that of 13 lb TKN/1000 gal of manure. In this project the very low N content is definitely an advantage to Daley Farms.

5) On page 1058 in the 6-Yr Soil Phosphorus Management Plan under scenario #1, applying 14,000 gal of manure for three consecutive years of corn with 25% carryover in year 2 and 25%+ again in year 3, one would be applying excessive N in that scenario. This should be changed.

6) Will soil NO3 or NH4 tests be used when manure is applied to a field for consecutive years? If so, when and how?
Conclusion: Between site characteristics of the designated MAS including very high STP levels, sloping soils, shallow soils, numerous setbacks, and the improper N recommendations being used in the EAW, I am very concerned about the success of the proposed dairy expansion project. The large amount of manure being produced appears to require more “manure friendly” land area than has been designated in the 42/44 MAS, unless manure is applied to the strongly sloping and shallow soils, which will lead to significant environmental concerns.
EXHIBIT 2
Nitrogen BMP’s for Corn in Minnesota

Gyles Randall
Soil Scientist (Retired) and Professor Emeritus
University of Minnesota

The purpose of this report, prepared for the Minnesota Center for Environmental Advocacy, is to review and assess the Minnesota Department of Agriculture’s (“MDA”) current proposal (Nitrogen Fertilizer Rule) to adopt restrictions on the fall and winter application of nitrogen fertilizer and adopt a “menu” of potential water resource protection requires (“WRPR”) that could be required in specific areas of the state via an order of the Commission of the Department of Agriculture.

MDA is currently proposing to:
1) Restrict application of nitrogen fertilizer in the fall or to frozen soils in areas of the state overlying vulnerable groundwater.
2) Identify mitigation level areas based on well water sampling for nitrogen-N concentrations and adopt WRPR’s for mitigation levels 3 and 4.

While MDA’s proposal for adoptions of WRPRs is directionally correct, MDA’s proposed WRPRs are not designed to, and cannot independently, prevent and minimize the nitrate pollution to the extent practicable; or prevent nitrate pollution from exceeding the health risk limit.

The University of Minnesota’s recommended Best Management Practices (BMP’s) for nitrogen fertilizer use are found in a series of University of Minnesota Extension bulletins written for specific geographic areas of the state and were published in 2008. These recommendations fall within and provide specifics for the currently popular 4R approach (right application rate, right source, right time of application and right placement). These BMP’s were developed from research based on yield optimization and the production economics of corn and not specifically on water quality indices. Environmental metrics such as nitrate concentration in drainage water or in the soil at the end of the growing season have been frequently measured along-side of agronomic and production metrics over a 33-yr period by this scientist in research studies located at Waseca, Lamberton and in southeastern Minnesota. In the future, scientists must collect agronomic and environmental data side by side in numerous studies located around the state if a robust data set is to be built, allowing N BMP’s for Minnesota to be based on agronomic, economic and environmental water quality measurements.
Summary

General Recommendations

- Using the right/correct rate of N is a foundational BMP from an economic and water quality perspective. Of all fertilizer N management practices, rate of application has the greatest potential for influencing nitrate losses to ground and surface waters. When determining the total N rate to apply, all forms of N should be included, i.e., N in starter fertilizer, weed and feed N, and ammonium-N in phosphate fertilizers. Nitrogen credits from previous crops and manure applications, requiring record keeping by the farmer, should also be included. Two additional practices that are sometimes associated with N rate decisions must be discontinued. They are: (a) application of excess “insurance” N generally associated with fall application and (b) using yield goal multiplied by a set K factor to determine the N rate needed. Neither of these practices is economically or environmentally sound.

- Spring application of N fertilizers is highly recommended regardless of N source. Corn grain yields are higher and nitrate losses are lower.

- No N is to be fall-applied to medium-textured SE Minnesota soils, coarse-textured sandy soils, and vulnerable soils throughout the state.

- Use split applications of N on coarse-textured soils.

- Incorporate broadcast or inject sidedress applications of urea and UAN into moist soil to a minimum depth of three inches.

- Restrict present “Acceptable, but with risk” BMPs if nitrate levels in ground and surface waters increase or BMPs are not used.

- Ag advisers (retailers, consultants, etc.) play a huge role in educating farmers and in advocating universal use of the 4Rs (right rate, right time, right source and right placement).
  - record keeping may be needed and should be considered in the more vulnerable areas and for fall application

- Cover crops perform quite well in Minnesota if planted by Sept. 1 when following sweet corn, peas, small grains, or corn harvested for silage. Innovative, newly developed planting equipment or aerial seeding may be successful for establishing cover crops in corn and soybeans well before harvest but risk of failure needs to be acknowledged.

- Use nitrification inhibitors (NI’s) such as N-Serve and urease inhibitors (UI’s) such as Agrotain and Limus when they are appropriate for reducing losses of yield and N.
• Shifting a small portion of Minnesota’s corn acres to other non-N demanding crops, such as alfalfa into crop rotations or establishing perennials on marginal land areas would likely reduce nitrate losses more than simply implementing N BMPs for the current corn and soybean dominated landscape.

**Primary BMP recommendations for southern Minnesota**

**Recommended**
- Spring preplant application of ammonia and urea or split applications of ammonia, urea, and UAN are highly recommended.
- Under rain-fed (non-irrigated) conditions, apply sidedress N before corn is 12 inches tall (V7 stage).
- When soils have a high leaching potential (sandy texture), nitrogen application in a split application or sidedress program is preferred. Use a nitrification inhibitor (N-Serve) on labeled crops with early sidedressed N.

**Acceptable, but with greater risk**
- Fall application of ammonia + N-Serve after soil temperature at the 6-inch depth is below 50ºF in south-central Minnesota.
- Late fall or spring preplant application of ESN in south-central Minnesota.
- Spring preplant application of ESN in southeastern Minnesota.
- Spring preplant application of UAN.

**Not Recommended**
- Fall application of ammonia, urea, and UAN, with or without a nitrification inhibitor (N-Serve) in the 7-county area of southeastern Minnesota.
- Fall application of N to coarse-textured (sandy) soils.
- Application of any N fertilizer including MAP or DAP on frozen soils. (runoff in spring snow melt can be significant)
- Fall application of urea and ammonia without N-Serve and urea with N-Serve in south-central Minnesota.
- Fall application of UAN (28-0-0).

**Field research recommendations**
- Continue to conduct N rate research studies to determine corn yield response, net return to fertilizer N, N recovery in the corn plant, and residual soil nitrate in the soil profile in the fall after harvest and again the following spring (to determine leaching losses) on the medium-textured soils of SE Minnesota and similar vulnerable soils of the state. Collection of soil water at 5’ or tile drainage would be helpful. These complete sets of production and environmental data will be relied upon and necessary to make improved N management decisions for Minnesota in the future.
Conduct cover crop research to increase the success of earlier fall establishment or to select/develop those cover crops that tolerate limited light in dense corn stands in August. Perhaps combining cover crops with lower vegetative biomass corn hybrids would allow for improved early fall establishment. Research comparing the economic risk of reduced corn yields with different N management and cover crop scenarios vs. the environmental benefit of reduced nitrate losses to ground water should be conducted.

Crop rotation research involving a year or two of alfalfa in a rotation such as C-S-C-A-A or other crops is encouraged. Determining the efficacy of these rotations to reduce nitrate losses to ground and surface waters while optimizing net return would be particularly valuable in the vulnerable soils within areas of “high dairy cattle numbers”.

**General Conclusions**

Will the 4R approach be successful in reducing nitrate-N losses to surface and ground water to meet the goals of Nitrogen Loss Reduction Strategies being established?

My answers are:

1) The 4R approach is directionally correct and helpful but will not accomplish the goal by itself in a landscape almost completely dominated by corn and soybean.

2) Universal commitment will be needed within the agricultural community (ag advisers, retailers, consultants, farmers, land owners, commodity groups, agricultural interest groups, etc.) to advance the 4R concept consistently and quickly.

3) Shifting acreage away from corn to other crops not requiring N or other cropping systems is the most effective strategy as it decreases N inputs to the landscape consequently reducing N losses significantly to ground and surface water.

4) Nitrate losses to ground and surface water are quickly and substantially reduced by perennial crops compared to annual crops. Shifting some of the least productive row-crop acreage to perennial-based conservation practices could reduce nitrate losses significantly while minimizing soil erosion and sediment losses to water bodies. Crop diversification has numerous ecosystem benefits compared to the current and dominant corn-soybean rotation.
Review of Current Draft NFR

After thoroughly reviewing the 5/24/17 version of MDA’s NFR, the following three statements register my concerns and suggested revisions that should be considered.

1) The statement “after no fewer than three growing seasons, the commissioner shall conduct a re-evaluation” appears in lines 9.2-9.3, 9.12, 9.20, 14.17, 14.21 and 15.20. This seems to be an easy way to simply extend it to 4, 5, 6 or more growing seasons. Or will three growing seasons be firm unless extenuating conditions occur? Deleting “no fewer than” is suggested.

2) On page 11, line 11.19 states “i. for corn, using the acceptable range for the 0.10 ratio for corn at a minimum as defined in Fertilizing Corn in Minnesota”. Because the N rate range often has a range of 20 to 30 lbs. N/acre, I am concerned that the high end of the N rate range will often be used by corn producers. Using the high N rate in this range is not likely to reduce nitrate concentration below the health risk level as frequently as the low end of the N rate range. Therefore, I would strongly suggest replacing acceptable range with MRTN (Maximum economic Return to N). Making this change to MRTN would mean using the N rate that is midway between the high and low N rates of the range. For instance, if the range is from 140 to 170 lb. N/acre the MRTN would be 155 lb. N/acre. The 155 lb. N rate is the most economically optimum rate and would be a better environmental rate than the highest N rate (170 lb.) in the range. This change is especially important when dealing with mitigation levels 3 and 4. It is likely that the highest N rate in the range would lead to increased nitrate concentrations rather than reduced concentrations.

The N rate situation becomes worse when southern Minnesota producers use Iowa State University base MRTN recommendation rates, which are 20 to 30 lb N/A greater than Minnesota’s recommendations. If the producers or retailers use the high end of the Iowa MRTN range, the application rate becomes 30 to 40 lb N/A greater compared to Minnesota’s base MRTN rate recommendation.

3) Under Subpart 1. Mitigation level 3 on pages 24 & 25, another BMP should be added. I suggest: M. crop diversification including perennial crops and alternative species not requiring N fertilization such as a 5-yr crop rotation with at least one year of alfalfa, grass-dominated cover-crops, and perennial grasses on buffers and marginal land areas.
History

A series of BMP’s were identified and assembled by the University of Minnesota and the Minnesota Department of Agriculture (MDA) as part of the Nitrogen Fertilizer Management Plan developed by the Nitrogen Fertilizer Task Force coordinated by MDA in 1990 and 1991. A series of seven (7) bulletins were developed for specific areas of the state (generally based on specific soil and climatic conditions) and were published by the Minnesota Extension Service in 1993. These N BMPs were broadly defined as “economically and environmentally sound, voluntary practices that are capable of minimizing nutrient contamination of surface and groundwater”.

Based on numerous N research experiments between the early 1990’s and 2005, involving both crop production and nitrate-N loss data, another set of management guidelines were developed to assist crop producers to manage their nitrogen in ways that optimize profitability, reduce risk, and minimize loss of nitrate to surface and groundwater. Similar to the 1993 publications, these voluntary management practices were published in a series of U of M Extension bulletins in 2008 to be adopted on a statewide as well as a regional basis. In these publications, the management practices (BMP’s) have been divided into three categories: (1) recommended, (2) acceptable but with greater risk, and (3) not recommended. The risks can be either economic (input cost or yield) or environmental (potential for loss of nitrogen to ground or surface waters).

Nitrogen Management Practices

Rate of N Applied

Using the correct amount of N as opposed to extra “insurance” N optimizes crop yield while minimizing N loss to the environment. However, there are two factors leading to the optimum N rate: (1) N becoming available from the soil and (2) N added as fertilizer N to meet the crop’s total N need. Unfortunately, two uncontrollable factors (precipitation and temperature) affect the release of N from the soil as well as the amount of N needed by the crop.

For many years the optimum N rate for corn in the Midwest was determined by multiplying the yield goal times a factor of 1.2, i.e., 160 bu/A x 1.2 = 192 lb N/A minus N supplied by the previous crop. Nitrogen fertilizer recommendations in Minnesota used a somewhat similar process, but they also included the level of soil organic matter. By the late 1990’s this method of determining the rate of N to apply was being questioned by Minnesota and Midwest agronomic scientists. Consequently, a massive effort by them involved the collection and interpretation of data from hundreds of fertilizer N rate response studies with corn in Illinois, Iowa, Minnesota, and Wisconsin. The data showed yield goal was not a good predictor of the N rate needed. Instead, the recommended rate of N to apply was determined to be within a range of N rates, depending on the productivity of the soil, previous crop, and the ratio of the price of fertilizer N to corn price. Each year additional N rate studies are conducted in all states.
to increase the size and value of the database and to include the newest corn genetics and higher yield potentials.

For southern Minnesota with 109 sites, the range of N rates for corn after corn and corn after soybeans using a fertilizer N price of $0.35/lb and a corn price of $3.50/bu is 141-160 lb/A and 98-122 lb/A, respectively. The maximum economic return to N (MRTN) is 149 and 108 lb/A, respectively. Thus, on highly productive soils a N rate of 149-160 lb/A is recommended for corn after corn and 108-122 lb/A for corn after soybeans. On lower productively soils where the yield potential is less due to limited water holding capacity, the recommended N rates are 141-149 lb/A for corn after corn and 98-108 lb/A for corn after soybeans.

As one can see from this discussion the recommended N rates for corn are based totally on the production economics of corn as influenced by a large N rate response database and soil productivity. The economics or risk of N loss to ground or surface waters is not included because it is an uncontrollable factor and is not predictable at the time of N application.

Rate of N application has a huge effect on corn yield/production and on nitrate-N losses on both well-drained and poorly-drained soils. On a well-drained Port Byron soil in Olmsted Co., three-year average continuous corn yields ranged from 65 bu/A with 0 lb N/A to 164 bu/A with 140 lb N/A. Residual nitrate-N in the 0-7’ soil profile after harvest with the 0, 90, 120, 150 and 180 lb N/A rates averaged 35, 45, 65, 110 and 140 lb nitrate-N/A. These data clearly show the huge yield response to fertilizer N coupled with the large amount of nitrate-N remaining in the soil in the fall when the applied N rate was above optimum. These high levels of residual N would be expected to leach from the 0-7’ profile into the groundwater aquifers between Nov. 1 and mid-June the next year when corn roots would be taking up soil N and fertilizer N again. In a 5-yr study on the same soil, corn yields following soybeans averaged 72% of maximum yield with no fertilizer N (In other words, the soil supplied 72% of the N needed for maximum yield. The remaining 28% would come from fertilizer N). When 90 lb N/A was applied, yields reached 97% of maximum yield. When rates of 120 and 150 lb N/A were applied, yields attained 100% of maximum. Residual nitrate in the 0-5’ soil profile after harvest (Nov. 1) totaled 30, 40, 75 and 95 lb NO3-N/A for the 0, 90, 120 and 150 lb N/A fertilizer N rates. These data also support the high potential for large leaching losses of nitrate to groundwater aquifers when N rates applied are in excess of optimum.

In poorly drained soils the effect of N rate on corn yield, profitability, and nitrate loss to tile drainage is shown in Table 1. Compared with the standard 120-lb N rate applied in the fall, adding an additional 40 lb N/A (160-lb N rate) increased yield 6 bu/A (4%), increased net profit by $7/A (5%), and increased NO3-N concentration in tile water by 4.9 mg/L (37%). In other words, the economic gain from excess N was small compared to the large environmental effect of increased nitrate loss to water. On the other hand reducing N rate from 120 lb N/A to 80 lb/A reduced yield 22 bu/A (13%), reduced net profit $63/A (45%), and reduced NO3-N concentration in the water by 1.7 mg/L (13%). Greatest yield and profit with a minimal increase in NO3-N concentration (4%) was found with the spring-applied 120-lb N rate. (Net profit was calculated using corn = $3.50/bu, N fertilizer = $0.35/lb N, and N-Serve @ $10/A). These data clearly demonstrate two fundamental findings: (1) the importance of using the correct N rate as a cornerstone BMP from an economic and water quality perspective and (2) the net
return advantage (42%) of applying the correct rate of N in the spring compared to the fall with minimal effect on NO₃-N concentration (4%).

Table 1. Effect of N rate on yield of corn after soybean and nitrate-N concentration in tile drainage at Waseca (2000-2003).

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</tbody>
</table>

Compliance with applying the correct rate ("Right Rate") of fertilizer N does not come easily and without well-ingrained attitudes, thoughts, perceptions, and challenges from a variety of positions. First, because the price of N fertilizer has generally been low compared to crop price and because wet growing season conditions can cause loss of N, farmers will often apply an extra 20 to 50 pounds of "insurance N" to ensure that yield-limiting conditions do not occur due to insufficient N. This is particularly true in years when crop prices are high and the potential exists for a high net economic return to fertilizer. Second, no farmer, dealer, ag adviser/consultant or landlord likes to see N deficiency symptoms (yellow corn) occurring, especially early in the season. Dark green, robust, even-looking corn is a "hallmark" visual assessment of a grower's ability to profitably produce corn. Yellow, N deficient corn has been known to terminate land rental agreements. Third, N credits from previous crops and previous manure applications vary if various crops were grown and manure sources and rates differed from field to field. This requires careful record keeping if correct N rates are to be applied for each field. Fourth, the amount of soil N mineralized to become available for the growing crop can be variable and is at this time not easily predictable. Thus, applying a slightly greater amount of fertilizer N is often done. Fifth, farmers often do not make their own fertilizer N rate recommendations; they rely on their retailer/dealer or on an ag adviser/consultant. This can present a problem, especially for the retailer who has a service and a product to sell. Trimming the "safe" higher-than-recommended rate to the correct/right rate of fertilizer N may be good for the farmer and the environment, but it may not be good for the retailer's bottom line because of reduced fertilizer sales volume - - - a primary profit stream for them. This can put the retailer on a slippery slope especially if part of the service required by the farmer is to minimize loss of nitrate to ground and surface waters. Consultants on the other hand have a service to provide and sell, but no fertilizer product to sell. Thus, they can adopt their fertilizer recommendations more easily to a correct/right rate of application that considers the risks of both profitability and environmental losses of N to ground and surface waters. Sixth, the total N rate should include any N applied in a starter, weed and feed program, and contributions from phosphorus fertilizers such as MAP and DAP. Also, appropriate credits must be taken for previous legume crops and any manure used in the crop rotation. Seventh, historically fertilizer N recommendations have been made only from
the production perspective. Combining an environmental perspective with the production perspective may take time for some fertilizer N advisers, but adapting to change rather quickly with good record keeping will be a successful approach for improved water quality and profitable production.

In summary using the correct/right rate of N has a high potential for improving net economic return for farmers while minimizing the loss of nitrates to ground and surface waters.

Time of N Application and N-Serve

Time of N application has been an issue in the northern latitudes of the U.S. since anhydrous ammonia (AA) became available in the 1950’s. The thinking was that fall N would not be lost from soils that were frozen for 3-4 months during the winter. As a result, AA was being applied as early as the first week of October in the 1970’s. Under warm conditions when the fall soil temperature was in the 60’s, significant conversion of AA to nitrate (nitrification) occurred, which was then lost via leaching or denitrification. Since the rate of AA nitrification is a function of soil temperature, research on the process indicated that nitrification was slowed substantially at soil temperatures < 50ºF. Research on nitrification inhibitors (NI’s) such as N-Serve in the 1970’s and 80’s in Minnesota showed that they significantly inhibited nitrification. As a result the following BMP guidelines for fall application of N in southern Minnesota have existed since 2008:

Not Recommended

- Fall application of ammonia, urea, and UAN, with or without a nitrification inhibitor (N-Serve) in the 7-county area of southeastern Minnesota.
- Fall application of N to coarse-textured (sandy) soils.
- Application of any N fertilizer including MAP or DAP on frozen soils. (runoff in spring snow melt can be significant)
- Fall application of urea and ammonia without N-Serve in south-central Minnesota.
- Fall application of UAN (28-0-0).

Acceptable, but with greater risk

- Fall application of ammonia + N-Serve after soil temperature at the 6-inch depth is below 50ºF in south-central Minnesota.
- Late fall or spring preplant application of ESN in south-central Minnesota.
- Spring preplant application of ESN in southeastern Minnesota.
- Spring preplant application of UAN.

Recommended

- Spring preplant applications of ammonia and urea or split applications of ammonia, urea, and UAN are highly recommended.
- Under rain-fed (non-irrigated) conditions, apply sidedress N before corn is 12 inches tall (V7 stage).
When soils have a high leaching potential (sandy texture), nitrogen application in a split application or sidedress program is preferred. Use a nitrification inhibitor (N-Serve) on labeled crops with early sidedressed N.

As one can see by the above Time of N recommendations, the influence of soil texture (coarse, medium, and fine), precipitation and characteristics of the N source are dominating factors when determining the suitability of fall-applied N.

The following text describing some of the research conducted in southern Minnesota contains corn production and water (soil and tile drainage) data that support the above Time of N Application recommendations. Southeastern Minnesota is characterized by permeable silt loam soils with underlying fractured limestone bedrock. This "Karst" region, which also receives the greatest amount of annual precipitation in the state, is very susceptible to ground water contamination. Consequently, few studies have examined fall application with spring and in-season N applications receiving most attention. A 4-yr study conducted in Olmsted Co. showed little yield average difference among the time of application treatments, but in the wet year (1990, 1987-89 were dry) fall-applied AA with and without N-Serve produced lower yields and greater NO3-N concentrations in the soil water at 5’ than did spring applications (Table 2).

Table 2. Corn yield and NO3-N concentration in the soil water at 5 feet as affected by rate and time of application in Olmsted Co., 1987-90.

| Nitrogen Treatment   | Grain Yield 1990 | Grain Yield 1987-90 | conc. in soil water
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate Ib N/A</td>
<td>1990</td>
<td>1987-90</td>
<td>ppm</td>
</tr>
<tr>
<td>0</td>
<td>76</td>
<td>84</td>
<td>1</td>
</tr>
<tr>
<td>75</td>
<td>145</td>
<td>156</td>
<td>11</td>
</tr>
<tr>
<td>Spr., preplant</td>
<td></td>
<td>155</td>
<td>29</td>
</tr>
<tr>
<td>150</td>
<td>&quot; &quot;</td>
<td>167</td>
<td>43</td>
</tr>
<tr>
<td>225</td>
<td>156</td>
<td>167</td>
<td>43</td>
</tr>
<tr>
<td>Fall</td>
<td>145</td>
<td>169</td>
<td>43</td>
</tr>
<tr>
<td>150</td>
<td>Fall + N-Serve</td>
<td>148</td>
<td>50</td>
</tr>
<tr>
<td>75 + 75</td>
<td>Spr. + SD (V7)</td>
<td>154</td>
<td>47</td>
</tr>
</tbody>
</table>

1/ Fall, 1990. Determined using porous cup suction samplers.

A long-term study on poorly drained soils in south-central Minnesota, comparing late-October application of ammonia with and without N-Serve with a spring pre-plant application without N-Serve, showed distinct yield and environmental advantages for spring application, but not in all years (Table 3). Across the 15-yr period, corn yields averaged about 10 bu/A greater for the fall N + N-Serve and spring N treatments compared with fall N without N-Serve. Also, compared with fall application of N without N-Serve, NO3-N losses in the drainage water were reduced by 14 and 15% and N recovery in the grain was increased by 8 and 9% for fall N + N-Serve and spring N, respectively. However, corn yields were significantly affected by the N treatments in only 7 of 15 years. In those seven years, when April, May and/or June were wetter-than-normal, average corn grain yield was increased by 15 and 27 bu/A for the fall N + N-Serve and spring N treatments, respectively. In summary, the 15-yr data suggest that...
applications of ammonia in the late fall + N-Serve or in the spring preplant were BMP’s. However, when spring conditions were wet, especially in May and June, spring application gave substantially greater yield and profit than the fall N + N-Serve treatment. Therefore, fall N + N-Serve application is considered to be more risky than a spring, preplant application of ammonia. Moreover when N-Serve was not used, fall application of ammonia was more risky (lower yields) compared with fall application + N-Serve.

Table 3. Corn yield and NO₃-N loss to drainage water as affected by time of application and N-Serve at Waseca, 1987-2001.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Time of Application³¹</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Yr Avg. Yield (bu/A)</td>
<td>Fall</td>
<td>144</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>Fall + N-Serve</td>
<td>131</td>
<td>146</td>
</tr>
<tr>
<td>7-Yr Avg. Yield (bu/A)</td>
<td>Spring</td>
<td>14.1</td>
<td>12.2</td>
</tr>
<tr>
<td>Flow-weighted NO₃-N concentration in tile drainage from the corn-soybean rotation (mg/L)</td>
<td>Fall</td>
<td>38</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Fall + N-Serve</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spring</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

³¹ Rate of applications for 1987-1993 and 1994-2001 were 135 and 120 lb N/A, respectively.

³² Only those seven years when a statistically significant yield difference occurred among treatments.

³³ Nitrogen recovery in the corn grain as a percent of the amount of fertilizer N applied.

A split application of ammonia with 40% applied pre-plant and 60% applied sidedress at the V8 stage was compared with late October and spring preplant applications of ammonia (Table 4). In this 7-yr period, grain yields were significantly greater (6 bu/A) for the split-applied treatments, resulting in slightly greater N recovery in the grain compared with the fall and spring treatments. However NO₃-N concentrations in the tile drainage were also slightly higher with split-applied N than for the spring N and fall N + N-Serve treatments.

Table 4. Corn production after soybeans and nitrate loss as affected by time of N application and N-Serve at Waseca, 1987-93.

<table>
<thead>
<tr>
<th>N Treatment</th>
<th>Time</th>
<th>N-Serve</th>
<th>7-Yr Average</th>
<th>Flow-weighted NO₃-N conc. in tile drainage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Corn yield</td>
<td>N recovery</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>bu/A</td>
<td>%</td>
</tr>
<tr>
<td>Fall</td>
<td></td>
<td>No</td>
<td>131</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>139</td>
<td>37</td>
</tr>
<tr>
<td>Spring</td>
<td></td>
<td>No</td>
<td>139</td>
<td>40</td>
</tr>
<tr>
<td>Split</td>
<td></td>
<td>No</td>
<td>145</td>
<td>44</td>
</tr>
</tbody>
</table>

LSD (0.10): 4
A 6-yr study comparing fall versus spring application of N-Serve with ammonia showed a statistically and economically significant 10 bu/A yield response to N-Serve applied in the fall (Table 5). The 4 bu/A yield increase to spring-applied N-Serve was not statistically significant and is considered economically neutral. However, a yield response to spring-applied N-Serve occurred in years when June rainfall was excessive. Because these data do not suggest a consistently significant and economical response to N-Serve applied in the spring and because excessive June rainfall can not be predicted at the time of spring ammonia application, adding N-Serve to spring-applied ammonia is not considered to be a BMP at this time.

Table 5. Corn grain yield after soybeans as affected by fall and spring application of N-Serve with anhydrous ammonia at Waseca, 1994-99.

<table>
<thead>
<tr>
<th>N-Serve</th>
<th>Time of application</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6-Yr. Avg. Yield (bu/A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td>161</td>
<td>171</td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td>172</td>
<td>176</td>
<td></td>
</tr>
</tbody>
</table>

The corn yield data obtained in the above studies clearly support spring applications over fall applications regardless of N source (ammonia or urea). This is especially true when April-June rainfall was above average, causing denitrification and leaching losses of N. In addition, nitrate-N concentrations in tile drainage water were reduced (14 to 18%) with the fall N + N-Serve and spring N applications.

With spring application of N showing these increased corn yields and reduced nitrate losses to water, one would expect most fertilizer N to be spring applied. This is not true in Minnesota, however, as there has been a historic, fall application culture for fall-applied AA by both retailers and farmers when fall conditions allow (crops harvested, soils relatively dry, and soil temperatures cooling to below 50ºF). Fall application is often considered an advantage to either the retailer and/or farmer for the following reasons:

- Logistics – The workload is spread out for the retailer when a portion of the N is fall applied.
- Less storage space is required with a combination of fall and spring application. Storage space can be refilled during the winter.
- Less worry by the retailer about being able to receive and deliver the total amount of N needed in a timely manner. They question whether the fertilizer N infrastructure is able to supply and deliver the fertilizer in a timely manner when only spring applied?
- Fall application is often preferred by the farmer because more time is usually available in the fall.
- If the N is fall applied, the farmer does not need to worry about it in the spring when tillage and planting are the highest priorities. The worries only begin to occur later in the spring if the soils are warm and rainfall is plentiful, causing loss of the fall-applied N.
• Soils are generally more firm and better suited for application without compaction in the fall - - favored by both farmers and retailers.
• Fertilizer N is often somewhat cheaper in the fall - - - an economic plus for the farmer.

N Source and Time of Application
The N source used must also be considered when selecting the proper time of application. Studies at Waseca in 1981 and 1982 compared fall application of anhydrous ammonia and urea, with and without N-Serve, to spring application of the same. Two-year average corn yields (Table 8) indicate: (a) broadcast and incorporated urea was inferior to anhydrous ammonia when fall-applied, (b) spring application of urea was superior to fall application, and (c) a slight yield advantage for spring-applied ammonia compared with fall application was found when averaged across N-Serve treatments.

A subsequent study evaluated late October application of urea (4" deep band) and anhydrous ammonia with and without N-Serve compared to spring preplant urea and anhydrous ammonia. Three-year average yields show a 33 bu/A advantage for urea and a 14 bu/A advantage for ammonia when applied in the spring (Table 6). Nitrogen recovery in the corn plant ranked: spring ammonia = spring urea > fall ammonia > fall urea. The effect of N-Serve in this study was minimal. Yield response to the spring treatments were greatest in 1998, when April and May were warm and late May was wet, and in 1999 when the fall of 1998 was warm and April and May, 1999 were very wet. Significant yield differences were not found in 1997 when the fall of 1996 was cold and the spring of 1997 was cool and dry.

In summary, these studies clearly show reduced corn yield and N recovery for fall-applied urea regardless of N-Serve use. Thus, fall application of urea with or without a nitrification inhibitor (NI) should not be recommended in south-central Minnesota.

Table 6. Corn yield and N recovery in the whole plant as influenced by time of application and N source at Waseca, 1997-1999.

<table>
<thead>
<tr>
<th>Nitrogen Management</th>
<th>3-Yr Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Source N-Serve</td>
<td>Yield N Recovery</td>
</tr>
<tr>
<td>Fall Urea No</td>
<td>152 43</td>
</tr>
<tr>
<td>&quot; &quot; Yes</td>
<td>158 47</td>
</tr>
<tr>
<td>&quot; An. Ammonia No</td>
<td>168 60</td>
</tr>
<tr>
<td>&quot; &quot; Yes</td>
<td>170 63</td>
</tr>
<tr>
<td>Spr. Preplant Urea No</td>
<td>185 76</td>
</tr>
<tr>
<td>&quot; An. Ammonia No</td>
<td>182 84</td>
</tr>
<tr>
<td>&quot; None --</td>
<td>112 --</td>
</tr>
</tbody>
</table>

LSD (0.10): 8
Preplant-applied urea gave significantly greater continuous corn yields in a 3-yr study in southeastern Minnesota than did preplant-applied UAN (28%N). Yields for a split application of UAN were not significantly different from the preplant urea treatment. A 4-yr study in south-central Minnesota showed greatest corn yields following soybeans with preplant-applied urea (182 bu/A), followed by preplant and incorporated UAN (181 bu/A), and poorest yields with broadcast pre-emergence UAN (166 bu/A).

The results from the four above studies are not surprising and could have been predicted given the characteristics of the three primary sources of fertilizer N in Minnesota - - - anhydrous ammonia, urea, and UAN (a 50:50 blend of urea and ammonium nitrate). These three sources currently occupy 39, 50, and 11% respectively, of the fertilizer N used for crop production in Minnesota. Ammonium forms of N fertilizer such as anhydrous ammonia with a nitrification inhibitor should be used for fall applications. Urea and anhydrous ammonia (both ammonium forms) should be used for spring preplant applications to reduce the potential for early-season nitrate loss. Urea-ammonium nitrate (UAN) contains 25% nitrate, which is immediately susceptible to leaching, performs best when split applied or applied in-season. Under normal spring conditions anhydrous ammonia will take up to six weeks to nitrify from ammonium to nitrate while urea may take up to three to four weeks. This delay decreases the potential for leaching of nitrate during the last part of April and in May, when precipitation is greatest and crop demand for nitrogen and water is low.

Method of Application – Placement

Method of application or placement choices are generally not large contributing factors in the management of anhydrous ammonia or urea. Anhydrous ammonia is usually knifed into the soil about 7” deep. The only time AA placement becomes a decision factor is when sidedressing where the AA is usually knifed in between each of the rows but can be knifed in between every other row. The latter method is easy and requires less tractor horsepower. Yield comparisons show no difference between the two. Urea is usually broadcast on the soil surface and then incorporated with tillage. In some cases, urea is knifed in about 4” deep. Yield differences are generally not found between the two placement methods. UAN has myriad placement options ranging from broadcast on the soil surface with or without incorporation by tillage, to dribbling in bands on the soil surface, to being knifed in about 2-3” deep with preplant, pre-emergence, and sidedress application times or with a combination of split applications. Yield differences among placement systems show little consistency except that incorporation of UAN produces greater yields than UAN left on the soil surface and not incorporated. Dribbling UAN within 2” of the corn row at a rate of 20-30 lb N/A has also been quite effective.

Although not a specific application/placement method, incorporation of urea and UAN is generally recommended because of the possibility of volatilization losses of ammonium if rainfall does not occur within a few days of application. Broadcast application of urea for no-till corn is a problematic application method likely to result in ammonia volatilization especially under high urease conditions [high levels of surface residue and calcareous soils (pH>7.4)]. Urease inhibitors such as Agrotain and other products, reduce the potential of volatilization losses of N to the atmosphere. These products should be impregnated into the urea before broadcast application.
In other studies, sidedress application of urea and UAN at the V6 stage followed by cultivation a few days later resulted in corn yield reductions of 12 to 17 bu/A. These data suggest that the urea and UAN had not been incorporated sufficiently deep into moist soil to move down into the active root zone, thereby remaining positionally unavailable.

In summary, these data for southern Minnesota support the recommendation of incorporating or injecting broadcast or sidedress applications of urea or UAN into moist soil to a minimum depth of three inches.

Relative Effectiveness of Management Practices to Reduce Nitrate Losses

Various N and crop management systems can be employed to reduce the potential of nitrate loss from corn production systems to ground and surface (tile drainage) waters. The N management practices are commonly referred to as BMP’s (best management practices) - - - the ones discussed within the preceding portion of this document. The following discusses each of the management practices shown in Table 7 and their relative effectiveness at reducing nitrate losses. The estimates are based on my experience and professional judgment.

Nitrogen Management Practices

Rate of N: Of the five N management practices, rate of N application has the greatest potential for reducing nitrate losses. The data shown earlier in this document clearly shows the huge impact of fertilizer N rate on nitrate concentrations and losses in drainage and soil water. The wide range in effectiveness is related to the amount of excess N above the recommended rate, ranging from minimal effectiveness if the excess rate is small (10-20 lb N/A) to substantial if the applied excess N rate is large (>100 lb N/A). These large excess rates could occur from a combination of fertilizer N coupled with manure N including the buildup of labile soil N from high rates of past manure and fertilizer applications. Discontinuing the application of 20-50 lb of excess “insurance” N for corn would significantly reduce nitrate losses.

In looking to the future, it is important to continue N rate research studies to determine yield response, net return to fertilizer N, N recovery in the corn, residual soil nitrate in the profile of medium-textured soils of SE Minnesota, and nitrate concentration in soil water or tile drainage when growing new highly productive corn hybrids. These complete sets of production and environmental data will be relied upon and necessary to make improved N management decisions for the future in Minnesota. Research on remote sensing and in-season adaptive models may be helpful to provide diagnostic information to improve N rate decisions. It will be particularly useful to focus some studies on slightly less-than-recommended N rates for corn on highly productive soils to more clearly define the yield and economic effects/risk relative to the environmental effects/risk with this reduced N rate approach.

Another factor that clouds the optimum N rate picture is the high levels of labile organic N, which have accumulated in soils that have received long-term abundant to
excessive rates of manure or fertilizer N over the years. Because significant amounts of the labile organic N can be mineralized into available N each year from these soils, optimum fertilizer N rates could be rather small due to the large amounts of available soil N, yet nitrate concentrations leached into ground and surface waters could be large.

**Time of N:** Time of N application also can have a significant impact on reducing nitrate losses. This is particularly true if growers were to discontinue this application of extra “insurance” N when fall applying their fertilizer. Growers have additional options, - - - either add a nitrification inhibitor (NI) such as N-Serve to the recommended N rate and fall apply after the soil temps remain below 50ºF or switch to spring or in-season applications involving various N sources. The data shown throughout the earlier portion of this document consistently show the corn yield and economic advantage to spring application of N. Reductions in nitrate concentrations and losses are much smaller than the large and consistent yield advantages for spring-applied N. The greater effect of Time of Application for ground water under well-drained soils is the dominance of leaching and absence of denitrification on these soils.

As fall application of N becomes less popular, especially on vulnerable soils, due to economic and environmental risks and challenges, new Time of Application research must consist of various spring and in-season application times coupled with various N sources, placements, and inhibitors - - - both NI’s and UI’s. It is unlikely that these “new” combinations of sources, placement, timing, and inhibitors/additives will show a large advancement of reduced nitrate losses. But, it is important to identify combinations that improve net economic return for the farmer and improve logistics for the retailer.

**Source of N:** In the big picture source of N has little effectiveness on reducing nitrate losses. However, two examples stand out where N source plays a significant role: (1) urea applied in the fall with or without a NI in south-central Minnesota. With this treatment, corn yields are reduced, largely due to nitrate losses. (2) UAN applied in the spring to well drained soils may be lost due to excessive spring rainfall, necessitating an additional in-season application of N that leads to the total N rate exceeding the original rate recommended.

**Method/Placement of N:** The method or placement of N generally has very little effect on nitrate losses even though it may affect grain yield some. An exception could be the broadcasting of urea or UAN without a urease inhibitor (UI) for no-till corn where surface residues are abundant and/or soil pH is high. Significant volatilization of ammonium could occur requiring a supplemental application of additional fertilizer, which would bring the total N rate applied to exceed the recommended N rate recommended.

**Inhibitors (NI & UI):** Nitrification inhibitors (NI) such as N-Serve and Instinct currently play a role of improving the performance of fall-applied ammonia and hog manure. Urease inhibitors (UI’s) such as Agrotain and Limus reduce volatilization losses of ammonium fertilizers applied to the soil surface. Proper use of NI’s and UI’s allows improved N management, which in turn often improves corn yield but the effect on nitrate losses to water is yet unknown.
Table 7. Relative effectiveness of management practices to reduce nitrate losses to ground and surface waters in Minnesota

<table>
<thead>
<tr>
<th>Practice</th>
<th>Tile Drainage Poorly drained</th>
<th>Ground Water Well drained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of N</td>
<td>L-H (10-60)*</td>
<td>L-H (10-70)*</td>
</tr>
<tr>
<td>Time of N</td>
<td>L (10-30)</td>
<td>M-H (30-80)</td>
</tr>
<tr>
<td>Source of N</td>
<td>VL (0-10)</td>
<td>VL (0-10)</td>
</tr>
<tr>
<td>Method/Placement</td>
<td>VL (0-10)</td>
<td>VL (0-10)</td>
</tr>
<tr>
<td>Inhibitors (NI &amp; UI)</td>
<td>L (10-20)</td>
<td>L (10-20)</td>
</tr>
<tr>
<td>Fall tillage</td>
<td>VL (0-10)</td>
<td>VL (0-10)</td>
</tr>
<tr>
<td>Cover crops</td>
<td>L (0-30)</td>
<td>L (0-30)</td>
</tr>
<tr>
<td>Cropping system</td>
<td>VH (100)</td>
<td>VH (100)</td>
</tr>
</tbody>
</table>

* = Effectiveness (0 = VL to 100 = VH)

Crop Management Practices

**Fall tillage:** A 11-yr study was conducted at Waseca comparing no tillage with moldboard plowing for continuous corn. Moldboard plowing produced higher corn yields and slightly higher nitrate concentrations in the tile drainage but lower drainage volume. No tillage produced lower corn yields and slightly lower nitrate concentrations but greater drainage volume. Thus, nitrate loads (drainage volume X nitrate concentration) were not different between the two tillage extremes. This study conducted where soils are frozen from December through March produced data much different than are found in warm climates, where fall tillage stimulates nitrification of soil organic matter and hence greater nitrate concentrations and losses.

**Cover crops:** Cover crops are getting much notoriety in the U.S. for their ability to take up residual N remaining in the soil after corn. The cover crops (mainly cereal rye plus a host of other crops) are established in the fall for nitrate uptake in the fall, winter in some cases, and the spring before the next crop is planted. These cover crops perform well at more southern latitudes (below I 80) where fall establishment is successful. This is not the case in Minnesota where the window for establishment in the fall between corn harvest and fall freezing is small. Successful establishment occurs when the cover crops can be planted rather early, when soils are warm, when soil moisture is plentiful, and when the first fall frost is delayed. Additionally, the window in the spring for uptake of nitrate is often quite short between warm temps for uptake and planting of the next crop. A 3-yr study at Lamberton for soybean following corn showed excellent cover crop growth in one year (both fall and following spring) with superb uptake of nitrate. In another year, establishment of the cover crop was not possible due to the cold fall. In the third year, the crop was adequately established but further growth and N uptake was marginal at best. Examination of the 3-yr results and the 40-yr fall weather history at Lamberton led the scientists to predict that cover crops in a corn-soybean rotation would work well in 1 of 4 years in southern Minnesota. Cover crops can work extremely well in Minnesota if planted by September 1 when following sweet corn, peas, small grains, and corn removed for silage. Additional research on adopting cover crops for a corn-
soybean rotation in Minnesota is needed. Developing or selecting species that can germinate and then tolerate dense corn growth, limiting light in August and early September, is needed. Establishing a cover crop in mid-June and getting it to live within the dense and shaded conditions from mid-July until early September would be ideal. Also, out-of-the-box research such as planting a high yielding corn hybrid that has a low biomass characteristic at various reduced populations to provide sufficient light for growth of cover crops seeded in mid-June would be valuable. Depending on corn grain yield, N rate, net economic return, and cover crop sustainability, growth and N uptake, this could be an alternative to simply reducing or shifting X amount of corn acres to another non-N demanding crop to achieve meeting the goals of the N Reduction Strategy.

**Cropping Systems:** Cropping system really is the primary factor that controls the input of nitrogen, the management of nitrogen, and nitrate losses to ground and surface water systems. Corn-based production systems, whether they are continuous corn, a C-C-soybean rotation, or a simple C-S rotation all require large input loads of fertilizer N. To determine the influence of cropping system on drainage volume, nitrate concentration, and nitrate loss in tile drainage, a 6-year study (1988-93) was established at Lamberton, MN. Drainage occurred in 1990-93, and the results are shown in Table 8. Based on these seminal, well cited data, it is fair to say that cropping system has a greater effect on hydrology and nitrate losses than any other management practice. The perennial crops [alfalfa and Conservation Reserve Program plants (brome grass, orchard grass, timothy and alfalfa)] reduced drainage volume by 25 to 50% due to greater transpiration and reduced nitrate loses by >95%. Thus, shifting some of Minnesota’s approximately 8 million areas of corn to other crops requiring substantially less to no nitrogen would likely reduce nitrate losses more than implementing all of the previous nitrogen BMP’s and crop management practices discussed earlier.

Rather than simply shifting one or two million acres to another non-N demanding crop, it may be wise to encourage crop rotation research involving a year or two of alfalfa such as a C-S-C-A-A rotation or perhaps other crops to determine their efficacy at reducing nitrate losses to ground and surface water systems while optimizing net return. Because alfalfa requires different seeding and harvesting machinery and storage facilities than row crops, perhaps “neighbor” farmers could be incentivized to fulfill the alfalfa needs of the system. This may have merit especially in vulnerable soils within areas of “high dairy cattle numbers”.

**Table 8. Effect of cropping system on drainage volume. NO$_3$-N concentration, and N loss in subsurface tile drainage during a 4-yr period (1990-93) in MN.**

<table>
<thead>
<tr>
<th>Cropping System</th>
<th>Total discharge inches</th>
<th>Nitrate-N Conc. mg/L</th>
<th>N Loss lb/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous corn</td>
<td>30.4</td>
<td>28</td>
<td>194</td>
</tr>
<tr>
<td>Corn – soybean</td>
<td>35.5</td>
<td>23</td>
<td>182</td>
</tr>
<tr>
<td>Soybean – corn</td>
<td>35.4</td>
<td>22</td>
<td>180</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>16.4</td>
<td>1.6</td>
<td>6</td>
</tr>
<tr>
<td>CRP</td>
<td>25.2</td>
<td>0.7</td>
<td>4</td>
</tr>
</tbody>
</table>
Emerging 4R Practices Water Quality Research

In the October, 2015 issue of the Journal of Environmental Quality, a Technical Report was published by L.E. Christianson (U of Illinois) and R.D. Harmel (Texas A & M) entitled “4R Water Quality Impacts: An assessment and synthesis of forty years of drainage nitrogen losses”. They reviewed and quantitatively analyzed nearly 1000 site-years of subsurface tile drainage N load data to develop a more comprehensive understanding of the impacts of 4R practices (application of the right source of nutrients, at the right rate and time, and in the right places) within drained landscapes across North America.

They concluded that some of the 4R practices for reducing nitrate-N loads were stronger than others.

- Optimizing N rate was important and will continue to receive primary research and regulatory focus.
- The lack of significant difference between N application timing or application methods (placement and source) was inconsistent with the current emphasis placed on timing as a WQ improvement strategy.
  - Application timing analysis were complicated by differences in application rates between timing treatments; highest application rates resulted in greatest N losses.

Editorial Comment

Will the 4R approach be successful in reducing nitrate-N losses to surface and ground water to meet the goals of Nitrogen Loss Reduction Strategies being established?

My answers are:

1) They are directionally correct and helpful but will not accomplish the goal by themselves.
2) Universal commitment will be needed within the agricultural community (ag advisers, retailers, consultants, commodity groups, agricultural interest groups, etc.) to advance the 4R concept consistently and quickly.
3) Shifting acreage away from corn to other cropping systems is the most effective strategy as it decreases N inputs to the landscape and significantly reduces N losses to ground and surface water.
References


EXHIBIT 3
Manure Application Acres Proposed at Daley Farms & Drinking Water Supply Management Area Vulnerability

Site
📍 Daley Farm Site

Manure Acres

Daley Farms Proposed Application Acres

Existing Feedlots

Animal Unit (AU) Count
- 0 (No Data)
- 1-150
- 150-300
- 300-1,000
- 1,000-5,000

Drinking Water Supply Vulnerability
- High
- Moderate
- Low
- Wellhead Protection Area

Map produced by Andrea Mathews at MCEA on October 29, 2019. Map data sources include feedlots from the MN Pollution Control Agency, wellhead protection areas, and drinking water supply management area (DWSHA) vulnerability from the MN Department of Health, and base map aerial imagery from MNGEO with distance buffers from Daley Farms proposed sale and application acres digitized from the EAW for Daley Farms (2018) at a scale of 1:10K in ArcGIS Desktop (v10.5). Map produced in ArcMAP, v10.5, ESRI 2017. This map is meant for illustrative purposes only. MCEA is not responsible for any inaccuracies herein contained.
Kim & Mark

I'm a farmer in karst country and have been for 40 years. We have had our farm well tested several times, most recently in 2017. The MDA testing revealed that our well is contaminated with nitrates 3 times the maximum allowed for safe drinking water at 30 ml/liter. We cannot drink our water – and we can't install a reverse osmosis system (our well doesn't recharge fast enough), nor can we afford to dig a new well – especially since the MDA gentleman who came to test and retest our well explained to us that not only was our Prairie de Chien aquifer contaminated with nitrates & atrazine, the next deeper Jordan aquifer was also nitrate contaminated, so we would have to drill down to the "old water" in deeper aquifers where heavy metals have leached in. No solution to our water problem. And we are not the only ones in this situation.

Since the February 4th MPCA informational meeting in Lewiston concerning the proposed expansion of the Daley dairy farm and the potential dangers from toxic air emissions related to this farm, I have been increasingly concerned that you and other MPCA staff involved in the EAW process and in the permitting process are not addressing your primary obligation -- your MPCA mission to...

"Protect and improve the environment and human health"

Even before the original permitting process was revoked and remanded for additional examination, it was clear to me and many other southeastern Minnesota-karst country residents that a proposed project of this size requires a full EIS assessment, notwithstanding that it seeks to illegally abrogate a county ordinance by proposing to expand to four times the Animal unit cap in Winona County.
That said, it must be clear to you and all the MPCA staff involved that this proposed CAFO expansion does nothing to protect or improve the health of our environment or of our people. In fact, this proposed project only produces harms to the environment and to public health.

Some examples...

Harm #1) Degradation of air quality for public health –

Air quality monitoring for public health requires that the measuring instruments be calibrated at the local CAFO site or a comparable CAFO site nearby. None of that has been done by the MPCA, so you have no reliable data re: air emissions and public health.


MPCA's assumption that this expansion is a "typical dairy farm" in relation to its air and odor emissions is false. Our average "typical" dairy farm in Minnesota has 200 cows, (86%) with 10% of our dairy farms at 500 cows. There is nothing about this proposed expansion that is "typical."

An EIS is required to gather appropriate data and fully analyze these potential emissions harms.

Harm #2) Release of dangerous green house gases –

MPCA is not able to conduct a full greenhouse gas life cycle analysis as is required, so its air emission recommendations are inadequate, inaccurate and incomplete. Basically your recommendations are only suppositions with no basis in scientific data that the agency has gathered and with no consideration of how our increasingly unpredictable weather events will affect emissions.

"Within the agriculture sector, carbon dioxide emissions increased by 16.2 percent, methane emissions by 14.4 percent and nitrous oxide emissions by 7.3 percent since 1990, the EPA reported. Methane is 28 times as potent as carbon dioxide and nitrous oxide is nearly 300 times as potent.

The increase in methane emissions mirrors the rapid expansion of factory farm in the U.S. over the last two decades, where thousands of animals are raised in confined spaces and include massive manure lagoons...

As policymakers develop future climate policy, it will be critical that they differentiate between industrial, factory farm systems and regenerative systems of production that can help respond to climate change.”  https://www.iatp.org/blog/201904/latest-agriculture-emissions-data-show-rise-factory-farms
An EIS is required to determine how adverse weather events and problematic manure storage practices will impact air quality & climate change.

Harm #3) Increased nitrate contamination of public & private wells –

MPCA & EQB has heard on several occasions from leading karst region expert, Dr. Calvin Alexander, University of Minnesota, and from local karst resident, farmer & expert on karst geology, Martin Larsen, Olmstead County SWCD, about the grave risks to the groundwater aquifers in southeastern Minnesota, especially Winona County. You know the wells in townships surrounding this dairy farm and its proposed expansion, as well as the city of Lewiston, are already contaminated with nitrates above the minimum standard for public health. You know also the grave risks these nitrate levels pose to public health, beyond the well-established blue baby syndrome:

"recent health research, including work by the National Cancer Institute, suggests that the 10 milligram limit is out of date and should be lowered. He said the research shows “pretty troubling results” that link drinking water containing nitrate of 5 milligrams and even less to cancers and, possibly, birth defects."

MPCA failure to aggregate manure application plans from all permitted farms above 1000 animal units means that you really have no idea how much nitrogen from manure application (and from commercial fertilizer) is being spread in any given watershed. And your practice of allowing farmers to sell manure and transfer ownership with no MPCA evaluation of the consequences of these transactions (about 42% of acreage for manure application for this project is not under Daley Farm management) means that it is impossible for you to protect our precious water resources if you continue to fail in gathering the necessary data. And you know that liquid manure knifed into soils in the karst region can be in groundwater resources in a matter of hours unless all external conditions are close to perfect!

It is clear that an EIS is absolutely required to examine how manure application plans relate to potential adverse weather events, to soil conditions, temperatures, and plant cover.

Harm #4) Reduced quality of life and enjoyment of property –

Everywhere that huge CAFOs (over 1000 animal units) are permitted, farm neighbors suffer. Their wells are contaminated. They often cannot be outdoors because of poor air quality and odor. Their property taxes are
affected by local and county resources being stretched and depleted in attempts to correct water quality problems. Local economies are negatively impacted by losing small and mid-sized family farms, lost in the farm crisis as small dairy farms, most of Minnesota’s dairies, face the overproduction by CAFO dairies and discriminatory pricing.

You have an absolute obligation to order an EIS so that karst country residents in Winona County can have a clear picture of the risks and dangers in this proposed expansion.

Nowhere in your materials, the original EAW or the supplemental EAW, do you say or even suggest that this project will "protect and improve" our air and water quality, truly advance soil health principles to have an impact on climate change, bring benefits to the lives of local residents, local business, local farmers, really protect the health and well-being of our citizens. Instead, everything in these EAWs describes the harms in this proposed Daley CAFO expansion and your HOPE that these harms will be mitigated by "best practices" that are flawed...

"One problem that arises in BMP planning is the use of overly optimistic treatment efficiency values without recognizing the variability in the effectiveness studies. When scaled up to landscapes or watersheds the uncertainty can affect the ability to assess the success of management programs (Ogle et al., 2003). There has been a history of watershed management programs around the country not achieving established water quality objectives despite the implementation of hundreds or thousands of BMPs". P.15 Agricultural BMP Handbook for Minnesota 2017  
https://wrl.mnpals.net/islandora/object/WRLrepository%3A2955/datastream/PDF/view

In addition, I’d like to point out that your education outreach program has a traveling Karst exhibit that is being presented in our SELCO regional public libraries, showing exactly the risks and dangers that face our karst country. Perhaps you should look at what another part of your agency is actually demonstrating about the vulnerability of karst country.

https://www.pca.state.mn.us/karst-outreach

https://www.kaaltv.com/minnesota-news/minnesota-karst-exhibit-coming-to-local-libraries/5655926/?cat=10151&fbclid=IwAR2LCJHhinm_hTAvMO459oF1vN55-wnXJ3XyvqLccYUrH97ufLgI0UTbKjo

You have the mandate, the authority, the responsibility and the obligation to "protect & improve" our environmental health and our public health. You need to do that…it’s time to order an EIS.
Sincerely,

Elizabeth Slocum
Sheep Sorrel Farm
31005 County 7 Blvd
Welch MN 55089
RESPONSES TO COMMENTS ON THE INDIVIDUAL NPDES FEEDLOT PERMIT DURING THE ADDITIONAL COMMENT PERIOD (January 21, 2020 through March 6, 2020)

The Minnesota Pollution Control Agency (MPCA) received a number of comments on the State of Minnesota Individual Animal Feedlot National Pollution Discharge Elimination System (NPDES) Permit MN0067652 (Individual NPDES Feedlot Permit) during the additional comment period (January 21, 2020 through March 6, 2020). See Appendix I for the complete list. In this Appendix, the MPCA responds to comments, except for comments from commenter number 12. Response to comments from commenter number 12 are incorporated into the Contested Case Hearing Findings of Fact document. Comments in this document have been grouped by themes.

Comments received during the initial public comment period (October 1, 2018 through November 15, 2018) are found in Appendix A, which is contained within Appendix D. Response to comments received during the initial public comment period are found in Appendix B, which is contained within Appendix D.

For additional information on how the comments were grouped, please contact the MPCA.

OVERALL PROJECT COMMENTS

Comment 1-1: Commenters support the Project. (6, 7, 9)

Response: The comments are noted.

Comment 1-2: Commenters oppose the Project. (2, 3, 5, 10)

Response: The comments are noted.

Comment 1-3: Commenters request that the MPCA prepare an Environmental Impact Statement (EIS) for the Project. (5, 11, 13)

Response: The Comment is beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Although beyond the scope of applicable feedlot regulations, MPCA provides the following information on the need for EIS:

An Environmental Assessment Worksheet (EAW) was required for the Project. Additionally, MPCA prepared a Supplement to the EAW that specifically looked at greenhouse gas emissions relating to the Project.

The MPCA Commissioner, following the criteria in Minn. R. 4410.1700, subp. 7, will determine the need for an EIS after carefully reviewing all information in the EAW, the Supplement to the EAW, and public comments on those documents. The MPCA Commissioner will develop Findings of Fact and Conclusions of Law to support either a positive declaration on the need for an EIS or a negative declaration on the need for an EIS.
COMMENTS CONCERNING WINONA COUNTY REGULATIONS

Comment 2-1: Commenter states that the project can’t be permitted since Winona County has an animal unit (AU) cap that the Project would exceed. (11)

Response: Comment is beyond the scope of the feedlot rules (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, and Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090) and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Although beyond the scope of applicable feedlot regulations, MPCA provides the following information:
Daley Farms must comply with or seek a variance from applicable local restrictions such as the Winona County AU cap, but those local restrictions are separate from and do not impact the state feedlot permit process.

GROUNDWATER AND WELL COMMENTS

Comment 3-1: Commenters state concern for groundwater. (3, 4, 5, 11, 13)

Response: Minn. R. ch. 7020, contain specific requirements for locating, constructing, and operating feedlot facilities in Minnesota. The requirements found in rules are designed to provide protection to Minnesota groundwater. In accordance with the feedlot rules, the Project includes a liquid manure storage area (LMSA); engineered design plans and construction specifications; and a manure management plan (MMP) describing how manure from the Project will be applied at agronomic rates based on the nutrient needs of the crops. The MPCA staff reviewed the Project’s design plans, construction specifications, and MMP, and found them to meet Minn. R. ch. 7020 requirements. The design plans, construction specifications, and MMP are all incorporated into the Individual NPDES Feedlot Permit. The Individual NPDES Feedlot Permit does not allow any discharge of pollutants from the Project site to surface or groundwater. The MPCA staff reviewed these design plans and construction specifications and found them to meet Minn. R. ch. 7020 requirements. Additionally, Daley submitted, as a part of its Individual NPDES Feedlot Permit application materials, best management practices (BMPs) that it will implement to further protect groundwater quality.

Further, the design of the LMSA includes perimeter drain tile to control the seasonal water table near the LMSA and allow Daley to observe if the LMSA is leaking. The Individual NPDES Feedlot Permit requires Daley to monitor the tile line and report any discharge from the site to the Minnesota Duty Officer and the MPCA.

Additionally, as a part of its Individual NPDES Feedlot Permit application materials, Daley submitted BMPs that it will implement to protect groundwater quality beyond what is required under the feedlot rules. Daley will employ two or more of the following practices on field areas where liquid manure is applied:

1. Delaying manure applications in the fall until soil temperature is below 50 degrees as determined by the closest soil temperature monitoring location available on the Minnesota Department of Agriculture (MDA) soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by thermometer at a depth of 6 inches.

2. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied.
3. Adding a nitrogen stabilizing additive at product recommended inclusion rates to manure when manure is applied in the fall before soil temperatures are below 50 degrees as determined by the closest soil temperature monitoring location available on the MDA soil temperature network website https://app.gisdata.mn.gov/mda-soiltemp/ or documented by soil temperature taken by thermometer at a depth of 6 inches.

4. Planting/seeding a cover crop on field areas when manure is applied early in the fall before soil temperatures are below 50 degrees. The seeding of the cover crop must occur early enough in the fall so to allow for germination and growth of the cover crop before the end of the growing season in which it is seeded and provide a minimum of 80% coverage of the land surface after manure application has occurred.

5. Applying manure in the spring.

6. Split applying nutrients with no more than 90 pounds of predicted plant available nitrogen being supplied by manure applied in the fall and the remaining nutrient needs being supplied by either manure or commercial fertilizer applied in the spring.

7. Avoiding application of manure on field areas that are shallow to bedrock (less than 40 inches – based on soil survey information). This practice only counts as a second practice if it is used in conjunction with practices 1, 4, 5 or 6.

Comment 3-2: Commenter states concern that well water is already unsafe. (4)

Response: The MPCA acknowledges that well water in different locations in the region may have contaminants. Unfortunately, contamination is a regional problem, which many are working to address. The Project is not anticipated to increase existing contamination. See response to comment 3-1.

The Minnesota Department of Health (MDH) recommends private wells be tested for coliform bacteria once a year, nitrate every other year, arsenic and lead at least once, and manganese before a baby drinks the well water. For more information on well testing, please visit this website http://www.health.state.mn.us/divs/eh/wells/waterquality/tips.html, or call the MDH well management program at 507-206-2700.

Additionally, at Winona County’s Household Hazardous Waste Building, 225 West 2nd Street, Winona, well water test kits are available for a fee. Call for details and to insure kits are in stock. 507-457-6563.

AIR EMISSIONS AND ODOR COMMENTS

Comment 4-1: Commenter states concern about the air emission and odors emitted from the Project. (13)

Response: Daley used the AERMOD dispersion model to predict emissions of hydrogen sulfide, ammonia, and selected odorous gases from the Project. The model estimated pollutant concentrations from the Project, nearby feedlots and background concentrations. Based on the results of the modeling, the MPCA does not expect significant air quality impacts. Attachment T of the EAW contains the full modeling report. EAW Item 6, air and odor emissions, page 15, provide an assessment of odors.

Additionally, since Minnesota has no odor rule, odor complaints are typically handled at the county or local level as many counties, townships, and cities do have local odor nuisance rules. However, odor complaints may be submitted to the MPCA, and MPCA staff will do appropriate follow-up that may include monitoring of hydrogen sulfide levels at the feedlot property line. In many cases, whether the
MPCA or local authorities receive complaints, the odor may no longer be occurring as odors are transient and time-limited. It also may not be possible to determine the source of odors.

Minn. Stat. 116.0713 outlines requirements regarding livestock odor as it relates to ambient hydrogen sulfide standards:

(a) The Pollution Control Agency must:

(1) monitor and identify potential livestock facility violations of the state ambient air quality standards for hydrogen sulfide, using a protocol for responding to citizen complaints regarding feedlot odor and its hydrogen sulfide component, including the appropriate use of portable monitoring equipment that enables monitoring staff to follow plumes;

(2) when livestock production facilities are found to be in violation of ambient hydrogen sulfide standards, take appropriate actions necessary to ensure compliance, utilizing appropriate technical assistance and enforcement and penalty authorities provided to the agency by statute and rule.

(b) Livestock production facilities are exempt from state ambient air quality standards while manure is being removed and for seven days after manure is removed from barns or manure storage facilities.

(c) For a livestock production facility having greater than 300 animal units, the maximum cumulative exemption in a calendar year under paragraph (b) is 21 days for the removal process.

(d) The operator of a livestock production facility that claims exemption from state ambient air quality standards under paragraph (b) must provide notice of that claim to either the Pollution Control Agency or the county feedlot officer delegated under section 116.07.

(e) State ambient air quality standards are applicable at the property boundary of a farm or a parcel of agricultural land on which a livestock production facility is located, except that if the owner or operator of the farm or parcel obtains an air quality easement from the owner of land adjoining the farm or parcel, the air quality standards must be applicable at the property boundary of the adjoining land to which the easement pertains. The air quality easement must be for no more than five years, must be in writing, and must be available upon request by the agency or the county feedlot officer. Notwithstanding the provisions of this paragraph, state ambient air quality standards are applicable at locations to which the general public has access. The "general public" does not include employees or other categories of people who have been directly authorized by the property owner to enter or remain on the property for a limited period of time and for a specific purpose, or trespassers.

(f) The agency may not require air emission modeling for a type of livestock system that has not had a hydrogen sulfide emission violation.

MISCELLANEOUS COMMENTS

Comment 5-1: Commenters state concern that the Project is too big. (1, 13)
Response: Comment is beyond the scope of the feedlot rules (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, and Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090) and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Although beyond the scope of applicable feedlot regulations, MPCA provides the following information:

Comment 5-2: Commenters asks who is responsible for cleaning up if the farm fails. (1, 3)

Response: A feedlot operating under an NPDES permit is responsible for cleaning up any surface water or groundwater contamination that it causes.

Comment 5-3: Commenter asks how many mortalities are on a mega farm. (1)

Response: Comment is beyond the scope of the feedlot rules (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, and Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090) and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Although beyond the scope of applicable feedlot regulations, MPCA provides the following information:

The Feedlot Permit requires Daley to manage animal mortalities in compliance with the Minnesota Board of Animal Health rules. Daley will remove animal mortalities from the barn upon discovery and contact a rendering service. Prior to pick-up by a contracted rendering service, which typically occurs within 48 hours, Daley will store the animal mortality in an enclosed and shaded structure. Daley predicts a mortality rate of 2% for the Project. In the event of a catastrophic loss, Daley will follow the state of Minnesota Emergency Response Plan.

Comment 5-4: Commenter asks if Daley Farms will be asked to use solar power and wind turbines. (1)

Response: Comment is beyond the scope of the feedlot rules (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, and Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090) and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Comment 5-5: Commenter feels that no till and cover crop practices should be incentivized as they improve soil health, reduce runoff and help sequester carbon. (5)

Response: Comment is beyond the scope of the feedlot rules (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, and Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090) and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Although beyond the scope of applicable feedlot regulations, MPCA provides the following information:

Planting of cover crops is a management practice currently implemented by Daley Farms and a management practice they plan to continue to implement in the future.

Comment 5-6: Commenter states concerns regarding MPCA’s data management practices relating to manure management information from all feedlots over 1,000 AUs and MPCA’s ability to protect water resources. (13)
Response: Comment is beyond the scope of the feedlot rules (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, and Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090) and Individual NPDES Feedlot Permit requirements the Project is required to meet.

Although beyond the scope of applicable feedlot regulations, MPCA provides the following information: Feedlots over 1,000 AUs are required to have a MMP and keep a record of manure applications and/or transfer of manure. MMP information includes amounts of manure that will be generated by the facility and the amount of nutrients the manure will contain. The MMP also provides information regarding if the manure will be retained or transferred. When manure is retained the MMP provides the field locations where the manure will be applied. Manure application records are required for both retained manure and transferred manure. Manure application record information includes information regarding where the manure is applied.

Minn. R. ch. 7020 contains specific requirements relating to the application of manure from feedlot facilities in Minnesota. The requirements found in rules are designed to provide protection to Minnesota groundwater and surface waters and are based on University of Minnesota Extension Service recommendations. The rules require that nutrient (nitrogen) application rates from all sources (manure, commercial fertilizers, and nutrient credits from previous crops that were grown) not exceed the expected crop nitrogen needs for non-legume crops or the expected nitrogen removal for legume crops. In addition to applying nutrients from all sources at agronomic rates (nutrient applications based on nutrient needs of the crop that will be grown), the rules require nutrient testing of manure, soil testing, and calibration of equipment used for application of manure. MMPs are updated annually to adjust for newly measured levels of nutrients and crop needs. The requirements relating to manure application apply not only to the feedlot owner, but also anyone receiving manure from the Project.

Comment 5-7: Commenter states concerns relating to economic impacts that feedlot facilities over 1,000 AUs have on neighboring property owners. (13)

Response: The Comment is also beyond the scope of applicable feedlot regulations (U.S.C. 1251, 40 CFR pts. 52, 122, 123, 127, 412, Minn. Stat. ch. 115 and 116, Minn. R. ch. 7001, 7009, 7020, 7053, 7060, and 7090), and Individual NPDES Feedlot Permit requirements the Project is required to meet.