

MINNESOTA DECISION DOCUMENT

3M Oakdale Disposal Site City of Oakdale, Washington County, Minnesota

SITE DESCRIPTION

Background

The 3M Oakdale Disposal Site (aka Oakdale Dump Site) is located along State Highway 5 in Oakdale, just west of Interstate 694. (Figure 1) The Site is listed on both the state and federal Superfund lists. It consists of three old dump sites (called the Abresch, Brockman, and Eberle Sites) at which the St. Paul based 3M Company and other companies disposed of industrial wastes containing Volatile Organic Compounds (VOCs) during the late 1940s and 50s. Disposal methods included burial and open burning. 3M also disposed of wastes at the Site that contained Perfluorochemicals (PFCs). PFCs are a family of synthetic compounds that have been used for decades to make products that resist heat, oil, stains, grease and water. 3M made PFCs from the late 1940s until 2002 at its manufacturing facility in Cottage Grove, Minnesota. However, the potential risks of PFCs and their presence in the environment have only become generally known to environmental regulators since the year 2000.

The Site was placed on the Superfund lists in the early 1980s due to soil and ground water contamination from VOCs, typically industrial solvents. In 1983, the MPCA, 3M and the United States Environmental Protection Agency (U.S. EPA) entered into a Response Order by Consent (1983 Consent Order (CO)) requiring 3M to investigate and implement response actions to address releases of VOCs at the Site. 3M implemented investigations and cleanup actions to address VOCs under the 1983 CO.

Cleanup actions to address VOC releases to soil and ground water at the Site included removing a large volume of waste material and contaminated soil, covering the Site with clean soil, and installing monitoring wells and a ground water pump-out system in 1984-85. The pump-out system is still in operation today. Some nearby residences whose shallow wells had VOCs in them were connected to the municipal water supply.

In 2004, after 3M disclosed that industrial wastes containing PFCs were disposed at the Oakdale Site, MPCA requested 3M to collect ground water samples from wells at the Site to be analyzed for Perfluorooctanoate (PFOA) and Perfluorooctane Sulfonate (PFOS). Results of these samples showed that PFOA and PFOS were present in the ground water at the Site. MPCA subsequently requested 3M to conduct a supplemental investigation to determine the extent and magnitude of releases of PFOA and PFOS to the environment at the Site. 3M completed this supplemental investigation in September 2006.

Figure 1



The 3 Dump Sites that Constitute the "Oakdale Dump"

STATEMENT OF PURPOSE

This Minnesota Decision Document (MDD) presents the selected response actions for PFC contamination at the 3M Oakdale Disposal Site and summarizes the facts and determinations made by the MPCA staff in approving the recommended response action alternatives.

Soil and ground water at the Site are impacted with PFCs and VOCs. Previous response actions have been taken by 3M to address VOC releases. The selected response actions in this MDD are intended to prevent human receptors and the surrounding environment from being exposed to contaminated environmental media that is currently on-site.

The Commissioner or his delegate has determined that the response actions set forth in this MDD are reasonable and necessary to protect the public health and welfare and the environment from the release and threatened release of PFCs from the Site.

DESCRIPTION OF PROBLEM

PFCs at the 3M Oakdale Disposal Site

Wastes containing PFCs were disposed at the Oakdale Site. These wastes have been released in the soil at the Site, to ground water flowing beneath the Oakdale Disposal Site, and to surface water in the vicinity of the Site. Ground water contaminated by PFCs has impacted the city of Oakdale's municipal wells and a number of private wells in western Lake Elmo.

The MPCA has installed Granular Activated Carbon (GAC) filters at a number of residences in Lake Elmo to remove PFCs from drinking water that exceeds the Minnesota Department of Health (MDH) health-based limits. 3M installed large carbon filters in 2006 at the Oakdale municipal water utility and provided a grant to the city of Lake Elmo to connect residences to the municipal water supply.

The MPCA and 3M signed a Settlement Agreement and CO on May 22, 2007 (2007 CO) requiring 3M to conduct an investigation and cleanup of PFC releases at and from the 3M Oakdale Disposal Site and two other 3M Disposal Sites (the 3M Woodbury and 3M Cottage Grove Disposal Sites). As part of its obligations under the agreement, 3M completed Remedial Investigations (RI) and Feasibility Studies (FS) for the Site, the focus of which was to identify threats to public health or the environment from releases of PFCs. The 2007 CO also required that in developing cleanup alternatives, primary consideration should go to those that excavate and destroy remaining PFC wastes; or excavate and dispose of PFC wastes in a permitted isolated, engineered containment facility.

The RI for the Oakdale Site showed that despite previous cleanup actions to address VOC releases, PFCs remained in a part of the Site called the Abresch area. The Abresch area is owned by 3M and covers about 55 acres straddling Highway 5 and bounded on the north by upper 35th Street, on the east by Hadley Avenue, on the south by railroad tracks, and on the west by Granada Avenue. The area north of Highway 5 is the location of proposed excavation and removal of PFC-contaminated material. There currently is a temporary fence in this area to control access during these activities. After excavation activities are completed, the area will be returned to an unfenced open space which 3M will monitor and maintain.

The part of the Abresch area south of Highway 5 was the primary location of previous removal actions to address VOCs and is where the previously constructed ground water pump-out system is located. Additional pump-out wells will be installed in this portion of the Site. This part of the Site will remain fenced to control access. One additional pump-out well will be located in the area north of Highway 5.

The objective of the FS is to evaluate various response action alternatives which address PFCs in soil and ground water at the Site, and to provide a recommendation for implementation. The MPCA reviewed and evaluated the alternatives and recommended a proposed cleanup plan for the Site.

The FS for the Oakdale Site was developed using guidance and remedy screening criteria developed by the U.S. EPA which are used in the federal and Minnesota Superfund programs. The FS evaluates, compares, and contrasts each remedy alternative for:

- short and long-term effectiveness
- reduction of toxicity, mobility, or volume through treatment
- implementability
- cost effectiveness
- overall protection of human health and the environment.

Summary of Alternatives

Remedy alternatives were developed in three categories: Site-Wide (SW), Soils (S), and Ground Water (GW). The following alternatives were developed for the FS:

Alternative SW-1 -- No Further Action. Standard baseline option evaluated at all Superfund Sites.

Alternative SW-2 – Institutional controls, access restriction, and ground water monitoring. Would include restrictive covenants to ensure that the future use of the area is limited to industrial/commercial purposes, fencing to restrict access, and prohibitions on new drinking-water wells. Ground water monitoring would continue for the long term.

Alternative GW-1 - Enhanced ground water recovery; air stripping and GAC pretreatment prior to sanitary sewer discharge. This alternative would expand and improve the existing pump-out system to capture and prevent migration of contaminants southeast of Highway 5, as well as decrease capture time north of the highway. This alternative would also control discharge of PFC contaminated ground water to surface water, most notably to Raleigh Creek. Discharge from the system would be treated by an air stripper to remove VOCs and by GAC filtration to remove PFCs, and then discharged via pipeline to a municipal wastewater treatment plant. PFCs are permanently destroyed when carbon filters are thermally regenerated. GW-1 was the only ground water alternative proposed in the FS. This type of system has been proven to be effective. MPCA has already approved the installation of the additional ground water pump-out wells as an interim response action under the 2007 CO. 3M is installing those wells and they will be operational prior to and during the excavation activities.

Alternative S-1 – Excavate soils to depth of 4 feet and disposal at a permitted industrial waste landfill for engineered, isolated containment. The three soil alternatives all are designed to remove PFCs in soils at the Site and reduce migration of PFCs from soils to ground water; they differ mainly in volume of soil removed and in degree of prevention of migration to ground water. Excavated areas under each of these alternatives would be replaced with clean fill.

Alternative S-2 – Same as S-1 but with deeper excavation (from 4-8 feet) to remove soil concentrations down to 30 ppm PFOS (the most environmentally serious PFC at this Site).

Alternative S-3 -- Same as S-1 but with deeper excavation (from 4 feet to the water table) to remove soil concentrations down to 6 ppm PFOS.

3M also submitted an Addendum to the FS which outlined proposed off-site disposal locations. 3M is recommending that the excavated PFC wastes from the Oakdale Site be taken to the SKB Landfill in Rosemount, Minnesota. SKB has proposed to build a separate engineered cell within its existing industrial waste containment facility at the SKB disposal facility to contain the excavated PFC-contaminated material. This separate cell would also be used for PFC wastes excavated from the Woodbury and Cottage Grove Disposal Sites. The MPCA has determined that the construction of this separate cell at the SKB Landfill for containment of PFC wastes from the 3M Disposal Sites meets the terms of the 2007 CO for engineered isolation and containment. The permit that MPCA recently re-issued to SKB allows for construction of this separate cell. Leachate from this separate PFC waste disposal cell will be collected and taken to the 3M Cottage Grove plant wastewater facility for treatment prior to discharge.

DOCUMENTS REVIEWED

MPCA's decision to select the remedy set forth in this MDD is based primarily on the following documents describing the Site as well as the effectiveness and cost analysis of response action alternatives for the Site.

- Ground Water Data Assessment Report Fluorochemical Investigation – 3M Company, July 2005
- Supplemental Fluorochemical Data Assessment Report – 3M Company, September 2006
- Assessment of the Effectiveness of the Existing Ground Water Recovery System – 3M Company, April 2007
- Remedial Investigation Report – Oakdale Disposal Site – 3M Company, June 2007
- Feasibility Study – Oakdale Disposal Site – 3M Company, January 2008
- Addendum to the Feasibility Studies for the Oakdale, Woodbury and Cottage Grove Sites - 3M Company, April 2008

ESTABLISHMENT OF RESPONSE ACTION OBJECTIVES AND SOURCE AREA CLEAN-UP CONCENTRATIONS

Response action objectives have been developed by the MPCA to minimize human exposure risk. Soil exposures will be addressed by removal of PFC contaminated soil, as well as backfilling with clean soil. Contaminated ground water will be controlled from migrating off-site to avoid impact to drinking water supplies and adjacent surface water bodies. Ground water that is pumped-out will be treated prior to discharge to the sanitary sewer system, thus reducing potential impacts to surface water bodies. The 2007 CO requires primary consideration be given to the excavation and destruction or excavation and engineered isolation and containment of PFCs at the Site. Response action objectives have been developed using Applicable or Relevant and Appropriate Requirements (ARARs) and are based on soil and ground water contamination data present in the MPCA Site files. The ARAR and other criteria considered by MPCA in selecting a remedy for the Site are listed below:

1. 29 CFR 1926. OSHA regulations for persons engaged in site-related activities
2. 40 CFR 264. Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities
3. 40 CFR 265. Interim Status Standards for Owners of Hazardous Waste Treatment, Storage and Disposal Facilities
4. 40 CFR 268. Land Disposal Restrictions
5. Minn. Stat. 103A. Provides State jurisdiction over surface water features, including wetlands such as lakes and ponds, and other wetland types
6. MPCA Soil Reference Values (SRVs)
7. MDH Health Risk Limits (HRLs) and/or Health Based Values (HBVs)

A. Response Action Objectives

The objectives for response actions at the Site are:

1. To eliminate unacceptable human risk exposure to PFCs in soil.
2. To reduce unacceptable human risk exposure to PFCs in ground water.
3. To reduce PFC concentrations in the surface water.
4. Re-establish an open space as a natural asset to the community.

RESPONSIVENESS SUMMARY

Pursuant to Minn. Stat. § 115B.17, subd. 2b (2006), the MPCA issued a public notice describing the MPCA-recommended response actions. The public notice was published in The Oakdale/Lake Elmo Review for the purpose of soliciting comments from the community. MPCA staff also held a public meeting at Oakdale City Hall to discuss alternatives and provide the public the opportunity to ask questions and provide comments on the proposed remedy. Three written comments were received at the public meeting.

One of the primary written comments received, along with comments made during the public meeting, concerned odors during excavation activities.

The area planned for excavation does contain some VOC concentrations which may cause odor issues. 3M has proposed, and the MPCA has approved, the installation of a Soil Vapor Extraction System (SVE) to reduce levels of VOCs found in soil, thus reducing potential for odor problems during excavation activities.

This system is installed and will operate until excavation activities commence. 3M has coordinated these activities with the City of Oakdale, and sent information concerning this installation to nearby residences.

Another primary comment received at the public meeting was to keep the public informed of activities at the Site. 3M has committed to keeping the public informed and aware of all activities undertaken or planned for the Site throughout implementation of cleanup actions. 3M intends to have additional public meetings and/or informational mailings to update the residences of future activities, and has established an informational repository at the Oakdale City Library. MPCA will provide updates on response actions at the Site through fact sheets available on MPCA's website and by quarterly reports to the MPCA Citizen Board at a regularly scheduled public meeting.

One other written comment received expressed concern that the investigations and proposed cleanup plans are taking too long and that 3M was not cooperating with the MPCA. In the 2007 CO with 3M, MPCA set specific time frames for completing the investigation and cleanup at the Oakdale Site. 3M has met all due dates and submittals required under the 2007 CO.

In addition to the written comments received at the public meeting, four comment letters were received during the public comment period.

One comment received from an environmental advocate, while commending the MPCA's work on this project, asked about MPCA's rationale for the proposed level of soil to be excavated. The MPCA makes decisions regarding the amount and concentrations of soil to be excavated based on SRVs for PFCs developed by MPCA staff. SRVs were developed to assist MPCA staff in the determining risks and making cleanup decisions related to potential human exposure to contaminated soil under certain land use conditions. In this case, all of the accessible soil in the affected area that exhibits PFC contamination will be excavated down to four feet below the ground surface and disposed off-site. In addition, those affected areas of PFC contaminated soil which exhibit concentrations of greater than 6 ppm of PFOS below four feet, will be excavated down to the water table. This concentration of 6 ppm is one-half of the Industrial SRV for PFOS.

This amount of excavation will remove greater than 95 percent of the mass of PFOS and PFOA in the affected area. The minimal amount of PFOS and PFOA that will remain and potentially migrate to ground water will be contained by the enhanced ground water control system. 3M currently owns this area of the Site and will continue to own this area. 3M will be required to record environmental covenants which impose land use restrictions to ensure that this area will not be redeveloped for residential use.

A second comment letter was received from the Washington County Board and the Washington County Department of Public Health, and commended the MPCA on the cleanup being proposed at the Site. One issue that the County would like to see evaluated further is the potential for beneficial re-use of the pump-out water. The current plan is to treat the pump-out water prior to discharge to the sanitary sewer. While the MPCA cannot dictate the use of the pump-out water for beneficial purposes, the MPCA can relay this recommendation to 3M for further consideration. The primary concern for the MPCA is that contaminated ground water is appropriately treated prior to discharge to ensure that receiving waters are adequately protected. As noted earlier, the MPCA has approved the installation of the additional ground water pump-out wells and those will be operational prior to and during the excavation activities.

A third comment letter was received from the Dakota County Environmental Management Department. The letter requested clarification as to how MPCA determines whether excavated soils must be managed and disposed as hazardous waste. Wastes containing PFCs have not been listed as hazardous wastes under state or federal hazardous waste regulations. The 2007 CO specified that excavated wastes from the 3M Disposal Sites cannot be considered hazardous waste based solely on the presence of PFCs.

Thus, the determination as to whether excavated soils are hazardous waste would need to be made on the basis of other contaminants or characteristics of the material. As noted, the area of excavation does contain soil contaminated with VOCs. Certain VOCs present at the Site (principally Toluene) are listed as hazardous waste in MPCA rules. However, under U.S. EPA guidance, contaminated media containing listed hazardous wastes removed from a Superfund Site may be disposed at an approved non-hazardous waste landfill if the concentrations of the contaminated media are below appropriate Industrial SRVs. 3M will be required to prepare a waste management plan outlining procedures for handling and disposal of the excavated soils. Any soils which exhibit VOC concentration levels above MPCA designated criteria will be required to be managed and disposed as hazardous waste, and thus will not be allowed to be disposed of at SKB. In addition, as noted above, 3M has been approved to install a SVE system in the area to be excavated. This will not only reduce the odor potential, but is expected to lower the concentrations of VOCs in the soil to levels below Industrial SRVs. 3M will be required to submit to the MPCA, updated soil analytical data following the operation of the SVE system and request a determination be made as to whether the excavated soil can be disposed as non-hazardous waste based on the concentrations of VOCs in the soil.

A fourth comment letter was received from a law firm representing the plaintiffs in a civil action against 3M. The commenter stated that 3M should remain financially responsible for the full cost of the cleanup at the Site. Under the 2007 CO, 3M is financially responsible for the entire cost of the cleanup, not only for 3M's direct costs of the cleanup, but for all costs associated with operation and maintenance to ensure the selected remedy remains protective, and for all MPCA costs to provide oversight of 3M actions. The commenter also stated that the citizens of Minnesota should receive the best cleanup plan regardless of cost. As noted previously, for feasibility studies done at Minnesota Superfund Sites the MPCA evaluates the alternatives, determines the effectiveness and implementability of each, reviews the cost effectiveness; and above all, determines if the proposed remedy is protective of public health and the environment. In this case, the MPCA has determined that the selected remedy for cleanup of releases of PFCs at the Oakdale Site is the best overall remedy. The commenter also stated that the excavated material be disposed at a more secure location than proposed. As noted previously, the SKB permit issued by the MPCA allows the construction of a separate cell to contain PFC contaminated wastes excavated from the 3M Disposal Sites. This permit specified requirements for design, construction and monitoring of this separate cell. As also noted previously, this facility meets the terms of the 2007 CO for disposal of PFC contaminated wastes in an engineered, isolated containment facility.

A copy of the Final MDD will be sent to 3M, the MDH, the City of Oakdale, the U.S. EPA and those submitting written comments regarding the proposed remedy.

MPCA's Selected Remedial Actions for the 3M Oakdale Disposal Site

The MPCA has selected a combination of the following alternatives outlined in the January 2008 FS as the remedy for PFC releases at and from the 3M Oakdale Disposal Site:

Alternative SW-2: Institutional Controls, Access Restriction, and ground water monitoring.

Institutional controls must be executed pursuant to the Minnesota Uniform Environmental Covenants Act, Minn. Stat. ch. 114E. A long term ground water monitoring plan will need to be submitted and approved by the MPCA, which includes appropriate monitoring of Raleigh Creek.

Alternative GW-1: Enhanced ground water recovery; air stripping/GAC pretreatment prior to sanitary sewer discharge. 3M will obtain appropriate Metropolitan Council Environmental Services permit for discharge of water to sanitary sewer. Monitoring of treated water discharged to the sanitary sewer system shall be done in accordance with an approved MPCA monitoring plan. As previously approved by the MPCA, 3M has begun installation of the ground water recovery system.

Alternative S-3: Excavation from 0-4 feet, enhanced soil removal in areas with greater than 6 ppm PFOS from four feet to water table, and disposal at existing off-site landfill. The MPCA has determined that the permitted SKB industrial waste disposal facility in Rosemount, with a separate cell for the PFC wastes, meets the requirement of the 2007 CO for an isolated, engineered containment facility for the excavated PFC waste material. The MPCA has further determined that the excavation and off-site disposal of PFC contaminated material from the Oakdale Disposal Site is necessary to protect public health and the environment from potential risk associated with the continued presence of the PFC contaminated materials. 3M shall submit for approval to the MPCA a waste management plan for the management and disposal of PFC-contaminated material excavated from the Site. In addition, under terms of the 2007 CO, and approved by the MPCA, 3M has installed a SVE, in the area of the Site to be excavated. The MPCA has determined that this combination of alternatives best meets the response action objectives for the Site, and meets the terms and conditions of the 2007 CO between 3M and the MPCA.

STATUTORY DETERMINATIONS

The selected response actions are consistent with the Minnesota Environmental Response and Liability Act, Minn. Stat. §§ 115B.01-.20, and are not inconsistent with the Federal Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601 *et seq.*, and the National Contingency Plan, 40 CFR pt. 300. The selected response actions are protective of public health and welfare and the environment.



Brad Moore
Commissioner
Minnesota Pollution Control Agency

11/4/08

Date



**Minnesota
Pollution
Control
Agency**

Remediation Division,
Superfund Program

3M Oakdale Disposal Site

Proposed cleanup plan for PFCs

c-s3-06 • May 2008

The Minnesota Pollution Control Agency is proposing a cleanup plan for the 3M Oakdale Disposal Site in Oakdale, Minn. The plan addresses contamination related to perfluorochemicals (PFCs) in wastes disposed of at the site by the 3M Company. This fact sheet describes the proposed plan and how the public can comment on the proposed cleanup alternative.

Background

The 3M Oakdale Disposal Site is located along State Highway 5 in Oakdale, just west of Interstate 694. The site is listed on both the state and federal Superfund lists. It consists of three old dump sites (called the Abresch, Brockman, and Eberle sites) at which the St. Paul-based 3M Company and other companies legally disposed of industrial wastes during the late 1940s and 50s. Disposal methods included burial and open burning.

The site was placed on the Superfund list in the 1980s due to soil and ground-water contamination from volatile organic compounds (VOCs), typically solvents. 3M completed site investigations and cleanup actions to address VOCs. Some nearby residences whose shallow wells had VOCs in them were put on city water.

Cleanup actions to address soil and ground-water contamination at the site included removing a large volume of waste material and contaminated soil, covering the site with clean soil, and installing monitoring wells and a ground-water pump-out system in 1984-85. The pump-out system is still in operation today.

PFCs at the 3M Oakdale disposal site

In 2004, PFCs were detected in pump-out wells at the 3M Oakdale Disposal Site. Prior to this time, the MPCA did not have analytical capabilities to sample and analyze for PFCs. PFCs are a family of synthetic compounds that have been used for decades to make products that resist heat, oil, stains, grease and water. 3M made PFCs from the late 1940s until 2002 at its manufacturing facility in Cottage Grove, Minn.

PFC-containing wastes were legally disposed of in four dumps or landfills (including, besides the Oakdale site, the 3M Woodbury site, Washington County Landfill, and disposal areas at the Cottage Grove facility). These wastes have contaminated ground water flowing beneath the disposal sites, which impacted several of the city of Oakdale's municipal wells and a number of private wells in western Lake Elmo. The MPCA has installed granular activated carbon (GAC) filters at a number of residences in Lake Elmo to remove PFCs from drinking water that exceeds the MDH health-based exposure limits. 3M installed large carbon filters in 2006 at the Oakdale municipal water utility and provided a grant to the city of Lake Elmo to connect residences to the municipal water supply.

Site investigations

The MPCA and 3M signed a Settlement Agreement and Consent Order in May 2007 governing investigation and cleanup of the four waste sites. As part of the agreement 3M completed Remedial Investigations (RI) and Feasibility Studies

c-s3-06

(FS) for the sites, the focus of which was to identify any remaining threats to public health or the environment from releases of PFCs at the sites. The Consent Order also required that in developing cleanup alternatives, primary consideration should go to those that excavate and destroy remaining PFC wastes; or excavate and dispose of PFC wastes in a permitted isolated, engineered containment facility.

The RI for the Oakdale site showed that previous cleanup actions had not removed all residual PFCs in a part of the site called the Abresch area. The Abresch area is shown on page 4. Straddling Highway 5, it is bounded on the north by upper 35th Street, on the east by Hadley Avenue, on the south by railroad tracks, and on the west by Granada Avenue. The Abresch area is owned by 3M and covers about 55 acres. The area north of Highway 5 is the location of proposed excavation activities. There currently is a temporary fence in this area to control access during these activities. After excavation activities are completed, the area will be returned to an unfenced open space which 3M will maintain.

The part of the Abresch area south of Highway 5 was the primary location of past waste removal actions and is where the current ground-water pump-out system is located. Additional pump-out wells will be installed in this portion of the site. This part of the site will remain fenced to control access. One additional pump-out well will be located in the area north of Highway 5.

Feasibility study

The objective of the FS is to evaluate various response action alternatives which address PFCs in soil and ground water at the site, and to provide a recommendation for implementation. The MPCA has reviewed the alternatives and is now ready to present its proposed plan for the site.

The FS for the Oakdale site was developed with guidance and screening criteria from by the U.S. Environmental Protection Agency which are used in the federal and Minnesota Superfund programs. The FS evaluates, compares, and contrasts each alternative for:

- short and long-term effectiveness
- reduction of toxicity, mobility, or volume through treatment
- implementability
- cost effectiveness
- overall protection of human health and the environment.

The FS for the 3M Oakdale site is available on the MPCA's Web page at www.pca.state.mn.us/cleanup/pfc/pfcsites.html.

Summary of Alternatives

Alternatives were developed in three categories: site-wide (SW), soils (S), and ground water (GW). The following alternatives were developed for the FS:

Alternative SW-1 -- No Further Action. Standard baseline option evaluated at all Superfund sites. Estimated cost: \$19,200.

Alternative SW-2 -- Institutional controls, access restriction, and ground-water monitoring. Would include deed restrictions to ensure the area remains zoned industrial/commercial, fencing to restrict access, and prohibitions on new drinking-water wells. Ground-water monitoring would continue for the long term (30 years). Estimated cost: \$577,000.

Alternative GW-1 -- Enhanced ground-water recovery; air stripping/GAC pretreatment prior to POTW discharge. This alternative would expand and improve the existing pump-out system to capture and prevent migration of contaminants southeast of Hwy 5, as well as decrease capture time north of the highway. Discharge from the system would go through an air stripper to remove VOCs and Granulated Activated Carbon filtration to remove PFCs, and then discharged via pipeline to a wastewater treatment plant (POTW). Estimated cost: \$4.63 million. (GW-1 was the only ground-water alternative developed in the FS because this type of system has been proven to be effective and permanently destroys PFCs when carbon filters are thermally regenerated)

Alternative S-1 -- Excavate soils to depth of 4 feet; disposal at existing off-site landfill. The three soil alternatives all are designed to remove PFCs in soils at the site and reduce migration of PFCs from soils to ground water; they differ mainly in volume of soil removed and in degree of prevention of migration to ground water. S-1 would remove soils to a depth of 4 feet and truck them to a licensed landfill permitted to accept industrial wastes. Excavated areas would be replaced with clean fill. Estimated cost: \$4.16 million.

Alternative S-2 -- Excavation to 4 feet and selective removal from 4-8 feet; disposal at existing off-site landfill. Same as S-1 but with deeper excavation to

remove soil concentrations down to 30 ppm PFOS. Estimated cost: \$5.6 million.

Alternative S-3 -- Excavation to 4 feet and enhanced selective soil removal from 4 feet to water table; disposal at existing off-site landfill. Same as S-1 but with deeper excavation (to the water table) to remove soil concentrations down to 6 ppm PFOS. Estimated cost: \$7.44 million.

3M has submitted an amendment to the Feasibility Study which outlined proposed off-site disposal locations. 3M is recommending that the PFC wastes from the Oakdale site, which are excavated be taken to the SKB Landfill in Rosemount, Minnesota. 3M and SKB have proposed to build a separate engineered cell at the SKB disposal facility to contain the excavated PFC waste material. This disposal location would also be used for PFC wastes excavated from the Woodbury and Cottage Grove disposal sites.

MPCA's recommended alternatives

The MPCA recommends implementing the following remedies at the Oakdale site:

SW-2: Institutional Controls, Access Restriction, and Ground-water monitoring

GW-1: Enhanced ground-water recovery; air stripping/GAC pretreatment prior to POTW discharge

S-3: Excavation from 0-4 feet, enhanced soil removal from 4 feet to water table, and disposal at existing off-site landfill. The MPCA has determined that the SKB facility in Rosemount, with the separate vault for the PFC wastes, does meet the requirement of the Consent Order for an isolated, engineered permitted facility to contain the PFC waste material.

MPCA staff believes this combination best meets the cleanup goals for the site. GW-1 and SW-2 would be implemented regardless of other alternatives chosen. Alternative S-3 will probably take two to three construction seasons to complete.

What are the next steps?

The MPCA will review any comments received and finalize the choice of remedial action(s), which will be documented in a Minnesota Decision Document (MDD). The MPCA's responses to comments received will be included in the Response to Comments attached to the MDD. Unless significant modifications to the proposed remedies described in this fact sheet are needed, design and construction of the selected remedies should begin in late 2008 or early 2009.

After the selection of the final remedy for the Site, 3M will prepare construction design documents for MPCA review and approval. These design documents will outline activities and have a more detailed schedule to complete the cleanup actions. Included in this plan will be such items as hours of operation, construction traffic flow, worker health, and safety and noise controls.

Public comment and meeting on proposed alternatives

Public review and comment on the proposed cleanup plan for the Oakdale site is an important contribution to the remedy selection process. The public is invited to submit written comments on this proposed plan through June 20, 2008. Written comments may be sent to Gary Krueger, MPCA, 520 Lafayette Road, St. Paul, MN 55155-4194 or email gary.krueger@pca.state.mn.us.

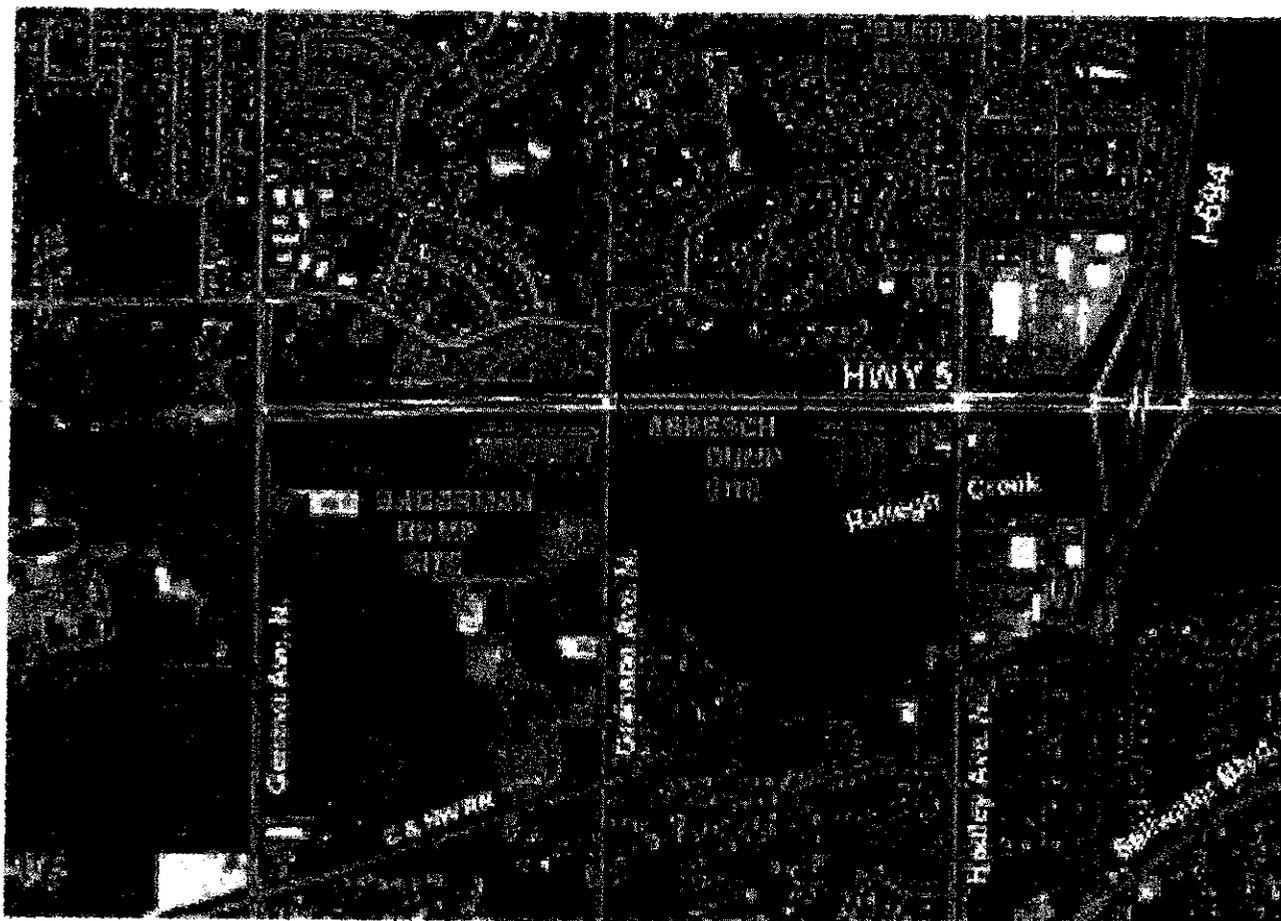
Table of alternatives (shaded = MPCA preferred alternatives)

Alternative	Description
1. SW-1	No further action
2. SW-2	Institutional controls, access restriction and monitoring
3. GW-1	Enhance pump and air stripping, GAC treatment
4. S-1	Excavate to 4 feet, offsite disposal
5. S-2	Excavate to 4 feet, selectively to 8 feet, offsite disposal
6. S-3	Excavate to 4 feet, selectively to water table, offsite disposal

The public is also encouraged to submit written comments in person at a public meeting on May 22, 2008 at Oakdale City Hall.

Where can I get more information?

The full FS, along with other site-related information, is available on the MPCA Web site at <http://www.pca.state.mn.us/cleanup/pfc/pfcsites.html>, or by contacting Ralph Pribble at the MPCA, (651) 296-7792 or ralph.pribble@pca.state.mn.us.



The 3 Dump Sites that Constitute the "Oakdale Dump"