

Managing Dredge Materials

In the State of Minnesota



Minnesota Pollution Control Agency

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Authors

Jeff Stollenwerk
Jeff Smith
Brett Ballavance
Julianne Rantala
Dale Thompson
Sandy Mc Donald
Emily Schnick

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Minnesota Pollution Control Agency

520 Lafayette Road North | Saint Paul, MN 55155-4194 | www.pca.state.mn.us | 651-296-6300
Toll free 800-657-3864 | TTY 651-282-5332

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Notice

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Contents

Background	1
<i>Purpose and audience.....</i>	<i>1</i>
Regulatory Determination	2
<i>Overview</i>	<i>2</i>
<i>Types of permits</i>	<i>5</i>
<i>No permit required</i>	<i>6</i>
<i>Other regulatory entities</i>	<i>7</i>
Environmental Risk Assessment	10
<i>Overview</i>	<i>10</i>
<i>Grain size analysis</i>	<i>11</i>
<i>Past industrial activities.....</i>	<i>11</i>
Sampling and Analysis	14
<i>Overview</i>	<i>14</i>
<i>Sediment characterization</i>	<i>14</i>
<i>Number and location of samples.....</i>	<i>19</i>
<i>Sampling methods</i>	<i>20</i>
Surface Water Discharges.....	20
<i>Effluent associated with the project</i>	<i>20</i>
Management Standards	21
<i>Overview</i>	<i>21</i>
<i>Re-handling, off-loading, and transportation of dredged material</i>	<i>21</i>
<i>Temporary storage and/or treatment of dredged materials.....</i>	<i>23</i>
<i>Long-term storage and disposal of dredged material</i>	<i>23</i>
<i>Site approval</i>	<i>24</i>
<i>Use or reuse of dredged material</i>	<i>27</i>
<i>Considerations for off-site facilities.....</i>	<i>29</i>
Permitting and Other Forms	30
<i>Overview</i>	<i>30</i>
<i>Permit application</i>	<i>30</i>
<i>Notification to managed dredged material without a permit (notification)</i>	<i>31</i>
<i>Annual dredged material report form</i>	<i>31</i>
Modified characterization and permit approach for urban stormwater ponds	32
Appendices.....	37
<i>Definitions</i>	<i>37</i>
<i>Best Management Practices for the management of dredged material</i>	<i>39</i>
<i>MNG990000 general permit authorization to manage dredged material</i>	<i>39</i>
<i>MPCA permitted disposal facilities accepting mixed municipal solid waste (June 2009)</i>	<i>40</i>
<i>Internet links and other resources.....</i>	<i>41</i>
<i>Resources for completing site assessments</i>	<i>41</i>
<i>Resources for dredged material characterization</i>	<i>41</i>
<i>Links to permitting forms.....</i>	<i>41</i>

Background

Purpose and audience

What is dredged material?

Dredged material includes material that is excavated at or below the Ordinary High Water Level (OHWL) of water basins, watercourses, public waters, or public waters wetlands, as defined by Minn. Stat. 103G.005. Examples of dredged material include sediment from the maintenance of dams and other hydraulic control structures; sediment from habitat improvement projects and other construction activities; sediment from the navigational dredging for shipping cargo and freight in Minnesota's commercial ports; and, dredge projects that require the removal of sediment from Minnesota waters at marinas and recreational boating areas.

Who is this manual for?

This guidance document is intended for use by project managers, including owners, operators, and/or consultants at projects or sites where dredged material is removed (generated), and is subsequently treated, stored, disposed and/or used or reused. In addition, this guidance document is intended for internal staff and other governmental entities to aid them in understanding the regulatory framework under which dredged material is regulated.

What is the purpose of this manual?

The purpose of this guidance document is to facilitate the proper management of dredged material by providing assistance to project managers and governmental entities. The objectives of this guidance manual are to:

- Provide a consistent and understandable regulatory framework for managing dredged materials.
- Promote consistency in the characterization and risk assessment of dredged material.
- Identify BMPs at dredged material sites to protect water quality at project sites.

Identify environmentally appropriate placement levels and management options for dredged material management in land-based systems.

This document is not intended to address issues related to dredging activity itself, or the inherent issues and regulatory controls associated with that activity. It is intended only to address the management of dredged materials, once removed from Minnesota waters, as well as the regulatory controls on the discharge of the effluent from dredge projects and/or management units.

If you have questions or need assistance with the use of this document, contact the Minnesota Pollution Control Agency (MPCA) at 651-296-6300, (metro area) or 800-657-3864 (out state). An electronic version of this document is available at the MPCA website at: <http://www.pca.state.mn.us/wfhy824>.

Regulatory Determination

Overview

Dredge projects and management areas have the potential to impact the environment. Carriage water and hydrostatic water from hydraulic or mechanical dredging processes, as well as stormwater runoff from dredged material management, transfer and off-loading sites, has the potential to pollute surface water when discharged to waters of the state. The management of dredged material also has the potential to affect groundwater through on-land management methods, if not managed in consideration of environmental risk factors.

Dredge projects may produce a variety of regulated wastes, including:

- dredged material
- wastewater from the dredge project and/or management area(s)
- stormwater originating within the boundary of the dredge project and/or management area(s)
- stormwater originating outside of the boundary of the dredge project and/or management area(s)

Regulated material

Dredged material is defined as a “waste” and “other waste material” by Minn. §Stat. 115.01. It is therefore the duty of the Minnesota Pollution Control Agency (MPCA), as set forth in Minn. §Stat. 115.03, subd. 1(e), to regulate the management and disposal of dredged material.

The MPCA's permitting role in the dredge program is for authorizing the on-land disposal or reuse of dredge materials, not the dredge activity itself. In-water disposal of dredged material is an activity that is regulated by the Minnesota Department of Natural Resources (MDNR) and/or the U.S. Army Corps of Engineers' (USACE), depending on the destined site of placement of the dredged material.

The MPCA utilizes the regulatory controls of the State Disposal System (SDS) permitting program, as described in this guidance document, to address the environmental issues associated with the management of dredged material and discharges from the dredge project and/or management area(s).

Depending on the situation, as described below and in the following section, a permit may be required for the management of dredged material in the state of Minnesota. The type of permit required will vary, depending on the level of pollutant contamination in the dredged material, whether effluent is being discharged, and how the dredged material and/or effluent are being managed.

A SDS permit may be required to store, treat, dispose and/or reuse dredged materials on-land in Minnesota if the dredged material originates from pollution remediation projects or from navigational channels and associated bays, harbors, docks and marinas from the following areas:

- Mississippi River downstream of River Mile 857.6 (which is approximately at the Soo Line Rail crossing near St. Anthony Parkway in Minneapolis)
- Minnesota River downstream of River Mile 27 (which is approximately two miles upstream of the CSAH 101 crossing at Shakopee)
- St. Croix River downstream of River Mile 26 (which is approximately three miles upstream of the East Chestnut Street crossing at Stillwater)
- St. Louis River downstream of the State Highway 23 crossing
- St. Louis bay or Duluth/Superior Harbor
- Out of state projects

Depending on the specific situation a permit may or may not be, required for the management of dredged material in the state of Minnesota.

Proposers of these projects should proceed to the flow diagram in Figure 1. If a permit is required, the type of permit required will vary depending on the level of pollutant contamination in the dredged material, whether effluent is being discharged, and how the dredged material and/or effluent is being managed.

Note: If the project is not located in the areas above, an SDS permit for the management of dredged material is not required.

Projects involving **sediment removal from municipal or urban stormwater systems** should follow the management guidance in **Modified Characterization and Permit Approach for Urban Stormwater Ponds** (see Permitting and other forms section of this document).

A NPDES/SDS permit is required for any surface water discharge not authorized by Section 404 of the Clean Water Act, including stormwater (if the on-land area disturbed exceeds one acre). See Stormwater website for more information at: <http://www.pca.state.mn.us/water/stormwater/stormwater-c.html>. For non-stormwater discharges see: <http://www.pca.state.mn.us/water/wastewater.html>.

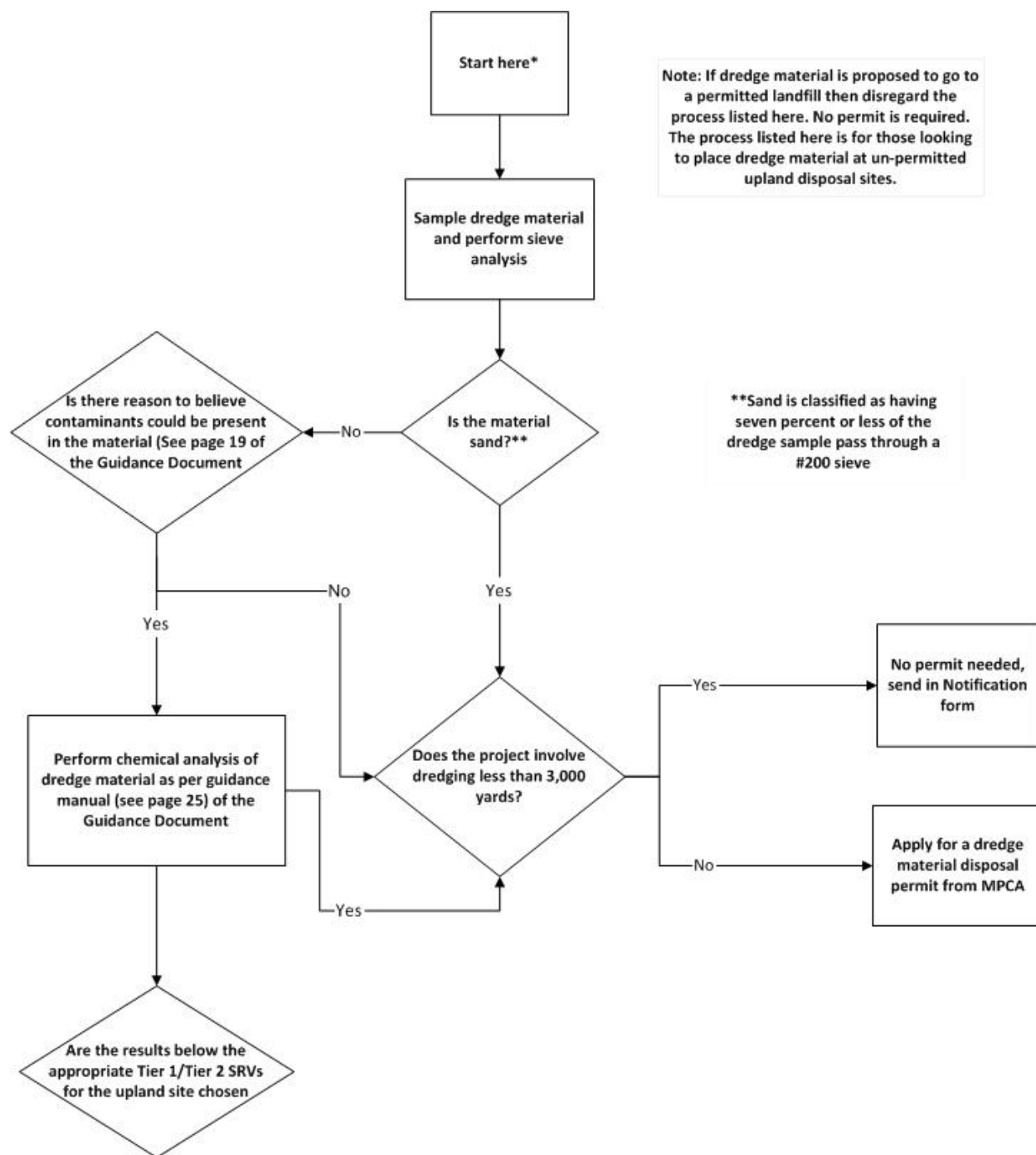
Projects not requiring a permit are *recommended* to follow the guidance and Best Management Practices (BMPs) described in this manual including submission of the "Notification to Manage Dredged Materials without a Permit" form. The MPCA is unable to provide additional technical assistance for these projects. The MPCA reserves the right to require a permit for any dredge material disposal or reuse if deemed necessary to achieve appropriate environmental protections.

Figure 1 is intended to guide users through the process of determining appropriate management options for dredged material, and the associated permitting requirements for various management methods. Answering "yes" or "no" to a question will lead to the respective answer, in terms of how to proceed through the flow diagram, and the regulatory controls of a particular management route.

There are a number of possible end results when determining the permitting requirements for your project, including the requirement to apply for an individual permit, the requirement to apply for coverage under the MNG99000 General Permit to Manage Dredged Materials, or that no permit is required. General permit number MNG990000 was previously in place to authorize the management of dredged material for sites or projects meeting the criteria outlined in the permit. This permit is currently expired and is in the process of being reissued. Until the MNG990000 is reissued, all projects required to obtain a permit are being issued individual permit coverage.

As noted in Figure 1, "de minimus" amounts of dredged material from projects involving the removal of less than 3,000 cubic yards of dredged material may not require a permit for the storage, disposal and/or reuse of this material if the material meets certain specifications.

Figure 1 Permit Decision Flow Diagram for Dredge Projects



For the purposes of making the de minimus volume determination, a “project” is defined as a discrete one-time excavation of material, or a series of dredging activities, such as with maintenance dredging, which involves multiple projects and multiple stages of a single project that are connected or are phased actions. Dredged material from connected or phased actions are to be summed over the course of a five year permitting window and considered in total in making the de minimus volume determination.

A “project” is defined as a discrete one-time excavation of material, or a series of dredging activities that are connected, or are phased actions.

Note: For dredge projects resulting from remediation projects being conducted under Superfund authority, disposal of dredged material within the Superfund project area is subject to Superfund preemption and is outside the scope of this guidance manual, as it is formally regulated under Superfund. If disposal outside the Superfund project area is selected however, the guidance contained in this document applies. The balance of this guidance document describes the characterization and management requirements for dredged material.

Types of permits

Permits issued for the management of dredged material are issued under the authority of state (SDS) regulations.

The SDS Program is structured to provide permit coverage for regulated activities in one of two ways:

- Most commonly, an “individual permit” is developed to be specific to the activities and types of pollutants managed from the facility.
- Alternatively, if there are common pollutants and issues that create a similar discharge at a number of facilities, a single, “general” permit can be developed.

Permits that would require identical limits and monitoring are more appropriately controlled by general permits. The more complex the discharge, the more likely an individual permit will be required.

General permit

General permit number MNG990000 was previously in place to authorize the management of dredged material for sites or projects meeting the criteria outlined in the permit. This permit is currently expired and is in the process of being reissued.

Once the general permit is re-issued, a specific project or site for the management of dredged material may be appropriately covered by general permit number MNG990000 if the following conditions are true:

General Permit number MNG990000 authorizes the management of dredged material.

- A characterization of the dredged material indicates the material is not a hazardous waste and is below the Soil Reference Values (SRVs) listed in the permit.
- Any site for the storage, disposal and/or reuse of dredged material is operated to protect ground and surface water.

Until the MNG990000 is reissued, all projects required to obtain a permit are being issued individual permit coverage. To apply for a permit, a permit application must be completed and submitted, which is included in the appendices section of this document. Once the general permit is reissued, MPCA staff review the application and determine whether the activity can be covered under the general permit or whether it needs to have individual permit coverage. If a specific activity does not meet the applicability criteria set forth in the general permit, coverage cannot be granted, and would have to be covered under an individual permit.

Individual permit

An individual permit is developed for a specific project or site activity and situation in mind. In the application process, the following type of information would be submitted for the respective management area(s) and/or project(s) to be covered by the permit:

- description of the dredge project and any management area(s)
- location of the dredge project and any management area(s)
- pollutants present in the material to be dredged

If a permit is issued for the specific project or site activity, the permit will be unique to the project and provide specific terms and conditions that must be met to legally discharge pollutants to waters of the state.

No permit required

As indicated by Figure 1, some types of projects do not require a permit from the MPCA. For example, the following types of projects do not require a permit from the MPCA for the management of dredged material:

- Projects involving dredged material originating from areas other than those described on page 2 of this manual.
- Projects involving the removal of **less than or equal to 3000 cubic yards** of material with no surface water discharge, and is either:
 - equal to or more than 93 percent sand, as determined by the grain size analysis
 - characterized as having contaminant values less than the relevant soil reference values for the proposed disposal option
 - disposed at a site or landfill that already has an MPCA permit that is approved to manage dredged material (Industrial Waste Management Plan)
- Projects involving the removal of more than 3000 cubic yards with no surface water discharge that is disposed at a site or landfill that already has an MPCA permit that is approved to manage dredged material (Industrial Waste Management Plan).

Some projects, including de minimus projects without a discharge, and those with disposal at an already permitted site, may not require dredge management permit.

For the purposes of making the de minimus determination, a “project” is defined as a discrete one-time excavation of material, or a series of dredging activities, such as with maintenance dredging, which involves multiple projects and multiple stages of a single project that are connected or phased actions. Dredged material from connected or phased actions are to be summed over the course of a five year permitting window and considered in total in making the de minimus determination.

A notification to manage dredged materials without a permit is recommended to be completed and submitted for all projects not requiring an MPCA permit.

For projects not requiring a permit, information pertaining to the project is recommended to be submitted to the MPCA. A Notification to Manage Dredged Materials without a Permit (Notification) is used for this purpose.

Notification

A Notification to Manage Dredged Materials (Notification) is recommended to be completed and submitted for all projects not requiring an MPCA permit. A Notification form is located on the MPCA website: <http://www.pca.state.mn.us/index.php/view-document.html?gid=6279>, and should be submitted **at least** 30 days prior to the initiation of dredge activities.

Management requirements for unpermitted projects

Dredged materials must be managed in a manner that protects ground and surface waters of the state. BMPs for the management of dredged material are specified in the MPCA fact sheet "Best Management Practices for the Management of Dredged Material" (wq-gen2-02, 12/11), included on the MPCA dredged materials website.

Stormwater permits for unpermitted projects

If managed in accordance with specified BMPs, permit coverage for industrial storm activities is also not required for projects not requiring a permit for the management of dredged materials.

Construction activities associated with dredge projects and dredged material management however, **are not exempted** from the requirement to obtain a separate construction stormwater permit, if required. Information about the construction stormwater program, permit information and permit application forms can be found on the MPCA website located at:

<http://www.pca.state.mn.us/water/stormwater/stormwater-c.html>.

Other regulatory entities

Projects that impact Minnesota's water resources are regulated by a variety of state, local, and federal agencies. Dredge activities must not be initiated until all applicable federal, state and/or local approvals that may be required for a particular project have been obtained. This includes, but is not limited to, state permits regulating activities in the bed of public waters as defined in Minn. Stat. 105 from the MDNR, federal permits for dredged or fill material from the USACE, and local permits from the appropriate Soil and Water Conservation District, county or local unit of government (LUG).

Projects that impact Minnesota's water resources are regulated by a variety of state, local, and federal agencies.

U.S. Army Corps of Engineers – Clean Water Act (CWA) Section 404 permit

The USACE Regulatory Programs include Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the CWA. The St. Paul District's regulatory jurisdiction covers the states of Minnesota and Wisconsin. An overview of USACE regulatory programs is located on the USACE website located at:

<http://www.mvp.usace.army.mil/regulatory/default.asp?pageid=799>. Under Section 10, a USACE permit is required to do any work in, over or under a Navigable Water of the US. Waterbodies have been designated as Navigable Waters of the United States (U.S.) based on their past, present, or potential use for transportation for interstate commerce. These waters include many of the larger rivers and lakes, such as the Minnesota, St. Croix, and Mississippi rivers; and Lake Superior and the Mississippi headwaters lakes.

Under Section 404, a USACE permit is required for the discharge of dredged or fill material into waters of the United States (US). Many waterbodies and wetlands in the nation are waters of the U.S. and are subject to the USACE Section 404 regulatory authority.

The MPCA has the option to waive its 401 certification of specific projects. A waiver of 401 certification does not relinquish the owner/operator to obtain any other applicable permit for the proposed project.

Early in 2000, the St. Paul District replaced all USACE Section 404 nationwide permits across Minnesota and Wisconsin with a combination of statewide regional general permits and letter-of-permission evaluation procedures. Permit information and permit application forms can be found on the USACE website located at: <http://www.mvp.usace.army.mil/regulatory/>.

For more information about USACE permits or federal regulatory requirements pertaining to dredge activities, contact the St Paul District of the USACE. A listing of USACE permitting staff for Minnesota counties can be found on the USACE website located at: <http://www.mvp.usace.army.mil/regulatory/default.asp?pageid=687>.

Minnesota Pollution Control Agency – CWA Section 401 Certification

The information in this section was taken from the MPCA's website describing the 401 certification program located at: <http://www.pca.state.mn.us/water/401.html>.

According to the federal Clean Water Act, anyone who wishes to obtain a federal permit for any activity that may result in a discharge to navigable waters of the U.S. must first obtain a state Section 401 water quality certification to ensure the project will comply with state water quality standards. Federal permits include Coast Guard Section 10 permits, Federal Energy Regulatory Commission permits and USACE Section 404 permits.

For example, if someone proposes to discharge dredged or fill material into navigable waters of the U.S., including wetlands; they must obtain a Section 404 permit from the USACE and a Section 401 water quality certification from the MPCA. The Section 404 Corps permit is by far the most common federal permit issued in Minnesota that requires a Section 401 determination from the MPCA.

During 2001-2006, the MPCA predominantly waived its Section 401 determination on projects required to obtain a Section 404 Corps permit, due to budget constraints. In late 2006, however, the MPCA determined it would no longer systematically waive its Section 401 authority on all Section 404 applications, and criteria were established to itemize the type of projects the MPCA would review in the future. In early 2007, the MPCA provided resources for this and the staff is now implementing the criteria. More specifically, the MPCA is now using its Section 401 authority to review Section 404 Corps Individual Permit applications for projects that:

1. Are within areas that directly drain to impaired waters (or those close to being impaired), Outstanding Resource Value Waters (ORVWs), or trout waters
2. Affect more than three acres of private project and five acres of public road wetlands within ½ mile of listed Impaired Waters (smaller projects with special concerns may also be considered)
3. Have the potential to inundate or deepen by excavation greater than two acres of wetland or otherwise not regulated by the Wetlands Conservation Act
4. Result in typically large wetland fills or drainage (e.g., linear projects, mining activities, multi-purpose roads with new bed alignments, new judicial ditching that have the potential to affect downstream waters, flood impoundment or diversion projects, large development and projects that may have adverse impacts on the watershed)

Projects that fit these criteria are now being reviewed by the MPCA to ensure they will be in compliance with state water quality standards. In particular, the MPCA intends to ensure that no prudent and feasible alternatives to impacting wetlands are available, the project's impact on wetlands is minimized, and adequate compensatory mitigation will be implemented to protect the designated uses of the wetland and the water quality standards of the affected watershed. Projects in these areas that will be in compliance with the standards will receive an MPCA 401 Certificate, the conditions of which will be incorporated into the Corps 404 Permit and must be adhered to by the Permittee.

Projects that will not be in compliance with state water quality standards cannot be certified. The projects for which none of the above criteria applies will likely be waived by the MPCA; however, there may be circumstances when that will not be the case. On average, the MPCA receives approximately 60-70 applications for a Section 404 Corps Individual Permit each year.

Examples of activities that may require a Section 404 permit and a Section 401 water quality certification include: placing fill or excavating in a wetland, building in a wetland, construction of boat ramps, placement of riprap for erosion protection, construction of dams, dikes or bridges, stream channelization and stream diversion.

More information on Minnesota's 401 Certification Program can be found at: <http://www.pca.state.mn.us/water/401.html>. An overview of the 401 Certification Program is summarized on the Environmental Protection Agency (EPA) website located at: <http://www.epa.gov/glupo/sediment/glitem/sec401.htm>.

Minnesota Department of Natural Resources

For projects that potentially impact water resources, one or more permits from the MDNR may be required.

A water use permit is required for all water users in Minnesota withdrawing more than 10,000 gallons of water per day, from surface or groundwater, or 1 million gallons per year. Permit information and permit application forms can be found on the MDNR website located at: http://www.dnr.state.mn.us/waters/watermgmt_section/appropriations/permits.html.

Projects constructed below the ordinary high water level (OHWL), which alter the course, current, or cross section of public waters or public waters wetlands, as defined by Minn. Stat. 103G.005 may require a public waters work permit. Such projects may also require an aquatic plant management control permit or a fishery related permit.

- More information about the regulatory requirements for projects involving public waters work permits can be found on the MDNR website at: http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/requirements.html.
- More information aquatic plant management control permits can be found on the MDNR website at: <http://www.dnr.state.mn.us/shorelandmgmt/apg/permits.html>.
- More information about fishery related permits can be found on the MDNR website located at: <http://www.dnr.state.mn.us/permits/fishery/index.html>.

Environmental assessments

Environmental review looks at how a proposed project could potentially affect the environment and ways to avoid or minimize impacts before the project is permitted and built. Environmental review can be a one or two-step process - the shorter, less detailed Environmental Assessment Worksheet (EAW) or the longer, more complex and detailed Environmental Impact Statement (EIS).

Two key components of environmental review are:

1. A multi-program analysis of a proposed project's environmental effects.
2. A public comment process.

The environmental review process operates according to the rules of the Environmental Quality Board (EQB), but is carried out by a local government unit or a state agency, which is termed the "responsible governmental unit," or RGU.

Some projects may trigger the need for an environmental review. Minn. R. 4410.4300 contains a list of categories that require environmental review and the RGU for a given type of project.

Examples of categories that may affect dredging projects include the following:

- construction of a new or expansion of an existing barge fleet facility
- a new appropriation for commercial or industrial purposes of either surface water or groundwater averaging 30,000,000 gallons per month, or a new appropriation of either groundwater or surface water for irrigation of 540 acres or more in one continuous parcel from one source of water
- a new permanent impoundment of water creating additional water surface of 160 or more acres or for an additional permanent impoundment of water creating additional water surface of 160 more acres
- construction or expansion of a marina or harbor that results in a 20,000 or more square foot total, or a 20,000 or more square foot increase of water surface area used temporarily or permanently for docks, docking, or maneuvering of watercraft
- diversion, realignment, or channelization of any designated trout stream, or affecting greater than 500 feet of watercourse with a total drainage area of ten or more square miles

If an EAW is required for a particular project, a permit cannot be issued until a negative declaration has been made by the entity required to complete the EAW (RGU).

More information about the Environmental Assessment process can be found on the EQB website at: <http://www.eqb.state.mn.us/program.html?id=18107> or the MPCA website located at: http://www.pca.state.mn.us/programs/envr_p.html.

Environmental Risk Assessment

Overview

In determining the most appropriate management method for dredged material, an evaluation of the reasonable likelihood for a given pollutant to be present in the material must be made. A determination as to whether a pollutant has 'reasonable likelihood' is done through a combination of empirical and technical evaluation of the sediment to be dredged, which may include sampling and analysis.

The following methods are used in preparing a risk assessment for the proposed dredging material:

- grain size analysis
- past industrial activities/sources of pollutants
- sampling and analysis of pollutants likely to be present

An evaluation of the reasonable likelihood for a given pollutant to be present in the material must be made, so that the proper management method for the material can be determined.

Grain size analysis

Begin the dredge site risk assessment by determining whether the material to be dredged is predominantly sand, gravel or pebble, or is comprised of other materials. Dredge material that is predominantly sand, gravel or pebble is unlikely to be contaminated, as pollutants do not generally adhere to these types of particles, and are therefore not incorporated into the sediment. Dredge materials that are primarily sand are unlikely to be contaminated and do not require additional chemical evaluation, and can proceed to permitting.

To demonstrate that dredged material from a given project or site is predominantly sand, 93 percent of the dredged material must be coarser than silt; i.e. only seven percent of the dredged material can be silty materials that are finer than sand. To make this determination, the following procedure must be used:

- a. Conduct a sieve grain size analysis using ASTM Method C-136 for the gradation analysis and ASTM Method D-2487 for classification.
- b. Determine the minimum number of samples required using Table 6, based on the total amount of material to be dredged.
- c. Conduct the analysis using the following US Standard sieves: 1", ½", 3/8", #4, #10, #100, and #200.
- d. Report the results for each of the discrete sample locations as a mass percentage of retained sediments.

If 93 percent or more of the dredged material is retained on a #200 sieve, that is, the material is coarser than silt, the dredged material is unlikely to be contaminated, and does not require additional evaluation.

In projects where more than 93 percent of the dredged material is coarser than sand, additional evaluation is not required.

Dredged material not excluded from additional analysis, as determined using the grain size analysis described above, must be more thoroughly characterized by evaluation of past industrial activities and analysis of dredged material for any pollutant has a reasonable likelihood to be present in the dredged material.

Continue the evaluation as described by the following sections. Analysis of base-line and additional sediment parameters are described in the following section.

Past industrial activities

Complete an examination of any historical records, data or maps that illustrate current and past land uses on the surrounding watershed, as well an examination of any existing sediment data or information pertaining to the project site. Performing this evaluation helps to identify the list of analytes that need to be tested by focusing only on pollutants that have a reasonable likelihood of being present in the sediment.

Resources that may be useful in making this determination include the following resources:

1. Figure 2, which contain a matrix of "Contaminants and Source Industries".
2. Appropriate maps, aerial photographs, or other graphics that show surface watercourses and groundwater flow patterns, land use, building locations, and other features.
3. A 'Phase I Site Evaluation' of the proposed site. Guidance on completing a 'Phase I Site Evaluation' can be located at: <http://www.pca.state.mn.us/publications/vic-gd8.pdf>.
4. Records of past spills and discharges (point and non-point) from various sources.
5. Current and past industrial, municipal and stormwater outfalls.

6. Levels of naturally-occurring parameters in the soils and sediments of the watershed and ubiquitous parameters (e.g., Polyaromatic Hydrocarbons, Polychlorinated Biphenyl, and heavy metals including lead and zinc) from anthropogenic sources.
7. Fish and wildlife public health advisories issued for the water body involved.
8. Location of a proposed project area in an impoundment behind a dam (soft sediments deposited in the impoundment may be contaminated from upstream sources).
9. Surface waters historically treated with copper and arsenic-containing herbicides or herbicides that may have contained dioxins as an unwanted manufacturing byproduct.
10. Location of former manufactured gas plants that may have historically discharged wastes including coal tars to the waterway. Mapped locations of former manufactured gas plant locations in Minnesota can be found online at: <http://www.hatheway.net>
11. Contaminated groundwater plumes from landfills and other sources (current and historical).
12. Other contaminant sources such as heavy outboard motor usage at marinas.
13. Presence of a brownfield in vicinity of the project site.
14. Identification of any contaminated sites along the waterway associated with the project, including those within the boundaries of, or in the vicinity of, any Superfund, Resource Conservation and Recovery Act of 1976 (PL 94-580, or remediation or other corrective action site. Use of the MPCA website at: <http://www.pca.state.mn.us/backyard/neighborhood.html> may facilitate this identification.
15. Field investigations of the proposed dredging site and the disposal location. During the site visit, the physical and biological characteristics of the site can be identified and linked to any of the file, map, and other information compiled from the reviews done on the subjects listed above.

The MPCA's website located at: <http://www.pca.state.mn.us/water/sediments/links-assessment.html> contains a listing of on-line resources for sediment evaluation.

Figure 2. Contaminants and source industries. Adapted from Inland Testing Manual (EPA/Corps, 1998.)

	Acenaphthene	Aldrin	Ammonia	Aniline	Arsenic	Benzo(a)anthracene	Benzo(a)pyrene	Cadmium	Chlordane	Chromium	Copper	Cyanide	DDE	DDT	Dieldrin	Endrin	Ethyl Parathion	Fluoranthene	Heptachlor	Hexachlorobenzene	Hexachlorocyclopentadiene	Lead	Mercury	2-Methylnaphthalene	Nickel	Oil and Grease	Organotin / Tin	PCB	Phenanthrene	Phosphorus	Pyrene	Selenium	Tetrachlorodibenzodioxin (TCDD)	Tetrachlorodibenzofuran (TCDF)	Toxaphene	Zinc	
Aluminum Die-casting								■		■															■	■											
Ammunitions											■																			■							■
Anti-fouling Paints											■												■	■				■									■
Automotive					■		■	■		■	■																■		■								■
Batteries																					■	■														■	
Boat Manufacturing / Boat Repair						■	■	■		■	■							■					■				■	■	■	■		■	■				■
Boat Refueling						■	■											■									■			■		■					
Chemical Manufacturing			■					■		■														■	■		■							■			■
Coal Gasification (MGP)	■					■	■					■						■						■		■				■		■					
Commercial Farming	■	■	■												■	■														■						■	
Corrosion Metallurgy										■	■	■											■			■										■	
Dairy			■																												■						
Detergents / Surfactants																														■							■
Dye	■			■																																	
Electrical								■			■												■	■		■			■				■				■
Explosives			■								■																										
Fish and Wildlife Consumption Advisory																								■				■									
Fruits and Vegetables			■																												■						
Leather / Tanning										■																											
Meat Products			■																																		
Metal Finishing / Refining				■	■		■	■		■	■	■										■	■				■	■									■
Metalurgical Processes					■																						■	■									■
Nitric Acid Manufacturing			■																																		
Oxide Manufacturing										■	■																										■
Pesticides / Fertilizers	■	■	■													■	■	■		■	■									■						■	
Petroleum Refining			■																				■											■	■	■	
Phosphate Mining																															■						
Photographic					■					■																					■		■				
Pigments / Inks			■	■																			■	■									■				
Plastics	■																						■														
Printing Plates																															■						■
Pulp and Paper Mills																								■		■	■							■	■		
Rubber																																■				■	
Steam Power				■	■		■	■		■	■												■			■											
Steel / Iron			■	■	■	■	■					■											■				■		■	■	■	■					■
Sulfuric Acid			■	■																																	
Textiles			■				■																														
Utilities																								■						■	■		■				■
Valuable Mineral Mining												■											■														■
Waste Water Treatment Plants			■						■	■	■												■	■		■	■		■		■	■					■

Sampling and Analysis

Overview

Characterization of sediment from the proposed dredge site must be completed **prior** to the initiation of dredging activity. Results of sediment characterization must be compiled and submitted for Minnesota Pollution Control Agency (Agency) review and approval with permit application or with the Notification to Manage Dredged Material without a Permit (Notification), as appropriate.

Additional monitoring and/or samples may be required for specific dredge projects and will be determined at the time of permit application or submittal of the Notification for the project. Any additional monitoring or sampling requirements will be specified by the Agency prior to permit issuance or general permit coverage.

Sediment characterization

Baseline sediment analysis

The baseline parameters, required analytical method and respective method detection levels specified in Tables 3 and 4 reflect the results of scientific research, and the experience of Agency and regulatory counterparts in dealing with dredge projects.

Dredged material not excluded from additional analysis, as determined using the grain size analysis must be analyzed for the analytes listed in Table 3. Note: If 93 percent or more of the dredged material is retained on a #200 sieve, that is, the material is coarser than silt, the dredged material is unlikely to be contaminated, and does not require additional evaluation.

Table 3. Base line sediment parameter list

Parameter	Analytical Method*
Arsenic	SW-846 6010 or 6020
Cadmium	SW-846 6010 or 6020
Chromium III	SW-846 6010 or 6020
Chromium VI	SW-846 6010 or 6020
Copper	SW-846 6010 or 6020
Lead	SW-846 6010 or 6020
Mercury	SW-846 7471
Nickel	SW-846 6010 or 6020
Selenium	SW-846 6010 or 6020
Zinc	SW-846 6010 or 6020
Total Phosphorus	EPA 365.3/365.4
Nitrate + Nitrite	
Ammonia-Nitrogen	
Total Kjeldahl Nitrogen	
PCBs (Total)	SW-846 8082
Total Organic Carbon	SW-846 9060
Sieve and Hydrometer Analysis	ASTM D-422

*Use the most current version available for Minnesota Certification for all analytical methods.

Additional sediment analysis

Based on the evaluation of historical land uses and the reasonable likelihood for pollutants in the sediment to be dredged, analysis of analytes beyond the baseline analytes may be required.

If it is established that it is reasonably likely for a pollutant to be present in sediment at a dredge site, the dredged material must be analyzed for the additional analyte(s) indicated. Table 4 lists additional pollutants of concern.

Table 4. Additional sediment parameter list

Parameter	Analytical Method*
Inorganics	
Barium	SW-846 6010 or 6020
Cyanide	SW-846 9012
Manganese	SW-846 6010 or 6020
Oil & Grease	SW-846 9071
Organics	
Aldrin	SW-846 8081
Chlordane	SW-846 8081
Endrin	SW-846 8081
Dieldrin	SW-846 8081
Heptachlor	SW-846 8081
Lindane (Gamma BHC)	SW-846 8081
DDT	SW-846 8081
DDD, DDE	SW-846 8081
Toxaphene	SW-846 8081
2,3,7,8-dioxin, 2,3,7,8-furan and 15 2,3,7,8-substituted dioxin and furan congeners	SW-846 8290
Polycyclic Aromatic Hydrocarbons (PAHs)	
Quinoline	SW-846 8270
Naphthalene	SW-846 8270
Pyrene	SW-846 8270
Fluorene	SW-846 8270
Acenaphthene	SW-846 8270
Anthracene	SW-846 8270
Fluoranthene	SW-846 8270
**Benzo (a) pyrene (BAP)/BAP equivalent	SW-846 8270

*Use the most current version available for Minnesota Certification for all analytical methods.

**The results for the following analytes should be used to calculate the BAP equivalent, as described by the MPCA document Polycyclic Aromatic Hydrocarbons, (p-eao2-03), and the Soil Reference Value (SRV) spreadsheet at <http://www.pca.state.mn.us/publications/c-r1-02.xls>. The BAP equivalent is compared against the soil reference value for Benzo (a) pyrene, above: Benzo (a) anthracene, Benzo (b) fluoranthene, Benzo (j) fluoranthene, Benzo (k) fluoranthene, Benzo (a) pyrene, Chrysene, Dibenz (a,j) acridine, Dibenz (a,h) acridine, 7,12-Dimethylbenz[a]anthracene, Dibenz (a,h)anthracene, 7H-Dibenzo(c,g) carbazole, Dibenz (a,e) pyrene, Dibenz (a,h) pyrene, Dibenz (a,i) pyrene, Dibenz (a,l) pyrene, 1,6-Dinitropyrene, 1,8-Dinitropyrene, Indeno(1,2,3-cd) pyrene, 3-Methylcholanthrene, 5-Methylchrysene, 5-Nitroacenaphthene, 1-Nitropyrene, 6-Nitrochrysene, 2-Nitrofluorene and 4-Nitropyrene.

For example, in the Great Lakes Basin, especially in the large tributaries and harbors, a more extensive list of parameters is required to properly characterize sediment. It is known that many of these tributaries have concentrations of polycyclic aromatic hydrocarbons (PAHs) from former coal gasification plants, urban run-off, oil spills, and vehicle and smoke stack particulate emissions that are deposited on the watershed. For projects involving sediment in urban areas associated with inland waters and Great Lakes tributaries, PAH analysis is required.

Analysis of parameters beyond the baseline analytes may be indicated based on the evaluation of historical land uses and the reasonable likelihood for pollutants in sediment to be dredged.

Two contaminants that bioconcentrate up aquatic food chains are highly bioaccumulative in upper trophic level organisms like game fish are Polychlorinated Biphenyls (PCBS) and mercury. In the risk assessment phase, fish consumption advisories issued by the Minnesota Department of Natural Resources (MNDR) should be reviewed to determine if the project area is in a water body included in the advisory. For projects involving sediment from waterbodies included in a fish and/or wildlife consumption advisory, mercury and PCB analysis, as relevant, is required.

Stormwater projects

Stormwater project proposers should also review the “Modified Characterization and Permit Approach for Urban Stormwater Ponds” section below.

Management levels

Based on the results of completed sediment characterization, that is, the type and level of pollutants in the material in comparison to established SRVs, dredged material is categorized into one or more Management Levels. The Management Level of a dredged material dictates the appropriate disposition of the material.

Dredged Material is categorized into three Management Levels:

- Level 1
- Level 2
- Level 3

Level 1 Dredged Material is suitable for use or reuse on properties with a residential or recreational use category.

Level 1 Dredged Material is characterized as being at or below analyte concentrations for **all** of the SRVs listed in the Level 1 SRV column of Table 5.

The SRVs incorporate the most common human exposure pathways (ingestion, dermal contact, and inhalation of contaminants volatilized from soil in outdoor air) using generic exposure assumptions. The Level 1 SRVs generally use a chronic residential exposure scenario, but are also protective of acute health effects in young children when acute toxicological data is available.

For dredged materials, the Level 1 SRV limits in Table 5 are the most restrictive.

Note: Exposure pathways in an agricultural land use setting have not been evaluated, and are therefore not an appropriate land use category for comparison to SRVs.

Dredged material is categorized into management levels, based on the level of contamination.

Level 2 Dredged Material is suitable for use or reuse on properties with an industrial use category.

Level 2 Dredged Material is characterized as being at or below analyte concentrations for **all** of the SRVs listed in the Level 2 SRV column of Table 5.

The Level 2 SRVs use an industrial exposure scenario based on average working adults according to a typical industrial site use. Level 2 SRVs are less restrictive than the Level 1 SRVs.

Level 3 Dredged Material is characterized as having significant contamination, as demonstrated by one or more analyte concentrations being greater than the Level 2 SRV column of Table 5.

Sites that have potentially important exposure pathways or other conditions that are not incorporated into a residential or industrial risk characterization must be evaluated in the context of a fully site-specific risk assessment for which site-specific SRVs are calculated that account for all potentially significant exposure pathways and characteristics of the site. Level 3 Dredged Material is considered to be significantly contaminated and must be managed specifically for the contaminants present.

In some cases a Level 3 Dredged Material may have levels of contaminants at levels subject to regulation under the Resource Conservation and Recovery Act (RCRA) and/or the Toxic Substances Control Act (TSCA), if PCB levels in sediment are 50 mg/kg or greater. In these cases, significant additional regulation applies, and disposal of the waste is strictly regulated.

Contact MPCA staff for additional information on regulatory requirements for disposal of Level 3 Dredged Materials.

Larger projects may produce dredge materials that can be segmented into areas with dredged materials that are distinctly different from each other. Subsets of dredged material may be able to be managed differently from each other, depending on the Management Level applicable to each discrete subset.

If subsets of Management Levels exist within the project, dredged material may be managed separately by levels, i.e. each subset of dredged material is managed at the relevant Management Level; managed at the most restrictive Management Level, if separation and management by subset is not feasible or desired; or, managed at the most restrictive Management Level if subsets from a given project or multiple project, such as at a use/reuse staging area, are co-mingled prior to disposal.

Calculation of BAP equivalents

Minnesota uses Potency Equivalency Factors (PEFs) to evaluate toxicity and to assess risks of carcinogenic PAHs. A PEF is a relative estimate of toxicity of chemical compared to a reference chemical. Benzo (a) pyrene (BaP) was chosen as a reference chemical for carcinogenic PAHs because its toxicity is well characterized. The BAP equivalent should be calculated in accordance with the MPCA document **Polycyclic Aromatic Hydrocarbons**, (p-eao2-03), and the Soil Reference Value (SRV) spreadsheet at: <http://www.pca.state.mn.us/publications/c-r1-02.xls>.

More information on Minnesota Soil Reference Values found can be found on the MPCA website at: <http://www.pca.state.mn.us/cleanup/riskbasedoc.html#pathway>.

Table 5: Dredged material soil reference values

Parameter	Level 1 Soil Reference Value (SRV) (mg/kg, dry weight)	Level 2 Soil Reference Value (SRV) (mg/kg, dry weight)
In-organics-Metals		
Arsenic	9	20
Cadmium	25	200
Chromium III	44,000	100,000
Chromium VI	87	650
Copper	100	9,000
Lead	300	700
Mercury	0.5	1.5
Nickel	560	2,500
Selenium	160	1,300
Zinc	8,700	75,000
Barium	1,100	18,000
Cyanide	60	5,000
Manganese	3,600	8,100
Organics		
PCBs (Total)	1.2	8
Aldrin	1	2
Chlordane	13	74
Endrin	8	56
Dieldrin	0.8	2
Heptachlor	2	3.5
Lindane (Gamma BHC)	9	15
DDT	15	88
DDD	56	125
DDE	40	80
Toxaphene	13	28
2,3,7,8-dioxin, 2,3,7,8-furan and 15 2,3,7,8-substitued dioxin and furan congeners	0.00002	0.000035
Polycyclic Aromatic Hydrocarbons (PAHs)		
Quinoline	4	7
Naphthalene	10	28
Pyrene	890	5,800
Fluorene	850	4,120
Acenaphthene	1,200	5,260
Anthracene	7,800	45,400
Fluoranthene	1,080	6,800
Benzo (a) pyrene (BAP)/BAP equivalent	2	3
* Benzo (a) anthracene	*Dibenz (a,h) anthracene	*3-Methylcholanthrene
* Benzo (b) fluoranthene	*7H-Dibenzo (c,g) carbazole	*5-Methylchrysene
* Benzo (j) fluoranthene	*Dibenzo (a,e) pyrene	*5-Nitroacenaphthene
* Benzo (k) fluoranthene	*Dibenzo (a,h) pyrene	*1-Nitropyrene
* Benzo (a) pyrene	*Dibenzo (a,i) pyrene	*6-Nitrochrysene
* Chrysene	*Dibenzo (a,l) pyrene	*2-Nitrofluorene
* Dibenz (a,j) acridine	*1,6-Dinitropyrene	*4-Nitropyrene
* Dibenz (a,h) acridine	*1,8-Dinitropyrene	
*7,12-Dimethylbenz[a]anthracene	*Indeno (1, 2, 3-cd) pyrene	

*The results for these analytes should be added together and treated as the BAP equivalent which is compared against the soil reference value for Benzo (a) pyrene, above

Number and location of samples

Number of samples

Analysis must be conducted on samples that are representative of, and in consideration of the dredged material and activities at the project site. At a minimum, the number of samples to be collected at a proposed dredge site is specified in Table 6.

In some cases, the minimum number of samples indicated on Table 6 will not be adequate to obtain representative samples, and properly characterize the dredged material. It is the responsibility of the generator of the dredged material to properly and completely characterize material to be dredged. All samples collected and analyzed must be reported.

In the event that the MPCA, upon review of the information submitted, determines that the dredged material has not been sufficiently characterized, additional sampling requirements will be specified prior to permit issuance or general permit coverage.

Table 6: Minimum number of samples for sediment characterization and evaluation.

Volume Planned for Removal, yd ³	Number of Core Sample Sites	Number of Sieve Analysis Sites
<= 1,000	1	3
1,000-30,000	3	6
30,000-100,000	5	10
100,000-500,000	6	12
500,000-1,000,000	8	16
>1,000,000	>8	>16

For projects involving excavation from multiple impoundments/basins, such as in Municipal Separate Storm Sewer System (MS4) cleanout projects, at least three samples should be taken from each impoundment/basin that is part of the project, except for small impoundment(s)/basin(s), from which at least one (1) representative sample must be taken. For the purposes of this guidance, an impoundment/basin is characterized as “small” if it has less than one acre of total surface area, and less than 1000 cubic yards of material is planned to be removed from the respective impoundment/basin. If applicable, the single sample in an impoundment/basin must be representative of the material to be removed, i.e. the sample should be taken roughly two-thirds of the distance from the inlet to the outlet, and should not be taken at the inlet or outlet of the impoundment/basin, or taken at the edges of the impoundment/basin.

For projects involving the disposal of dredged material, the MPCA may require samples to be taken from the proposed disposal site and analyzed for parameters found to be elevated in the dredged material sediment samples. The number and location of disposal facility site samples required will be specified by the MPCA based on the size and other characteristics of the site prior to permit issuance or general permit coverage.

Location of samples

Sample locations and depth must properly characterize the dredged sediment.

The MPCA may request reference or control samples outside the project area if review of sediment characterization suggests that some background sediment contamination is likely (e.g., PAHs are often elevated in urban settings from man-made sources). Ideally, the reference site would have similar physical and location characteristics as the project sediments.

Sampling methods

The following standards should be applied to the collection and handling of dredged material samples.

1. A laboratory certified by the Minnesota Department of Health must conduct analyses of dredged material.
2. Samples must be managed in accordance with ASTM E1391-03 Standard Guide for Collection, Storage, Characterization, and Manipulation of Sediments for Toxicological Testing and for Selection of Samplers Used to Collect Benthic Invertebrates.
3. All samples must be taken with a core sampler, or another MPCA approved method.
4. All sampling equipment must be properly cleaned prior to and following each sample collection.
5. Samples collected for PCB, pesticide and other organic analyses must be collected and processed using metallic (stainless steel preferred) liners, tubs, spoons, and spatulas. Samples collected for other chemical analysis, including heavy metals, must be collected and processed using non-metallic liners, tubs, spoons, and spatulas.
6. Core samples from the dredging site must be taken to the proposed dredging depth plus two feet, and must be analyzed from each distinct layer observed in the material to be dredged. If no strata formation exists, core samples shall be divided into two-foot segments, and each segment shall be analyzed for the required chemicals and characteristics. For cores extending into parent material, analysis of only the top two-foot segment of parent material is required.
7. Core samples must be visually inspected for the existence of strata formation, and a written description including position, length, odor, texture and color of the strata shall be provided to the MPCA.

U.S. EPA has recently published a guidance manual in regard to collecting, storing, and handling sediments for chemical and toxicological analyses:

U.S. EPA. 2001. Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual. EPA 823-B-01-002. U.S. Environmental Protection Agency. Office of Water, Washington, D.C.

Surface Water Discharges

Effluent Associated with the project

Depending on the set up of the dredging site, the dredged material and/or other site characteristics, excess carriage or conveyance water, or interstitial or pore water may be present at the management area and need to be managed appropriately. In addition, stormwater impacted by the dredging project and/or activities at the site, may need to be managed.

Discharges to surface water

The MPCA is not authorized to issue NPDES permits for discharges of dredged or fill material from dredge activities [40 CFR 122.3 (b)]. The USACE Regulatory Programs include Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. The St. Paul District's regulatory jurisdiction covers the states of Minnesota and Wisconsin.

A NPDES/SDS permit is required for any surface water discharge not authorized by Section 404 of the Clean Water Act, including stormwater.

Discharges to wastewater treatment facilities

Discharge from the dredge project and/or management area to a municipal wastewater treatment system is not allowed unless authorized by the pretreatment standards of the MPCA and the municipal authority.

In addition, if discharge is authorized, the transport of pollutants to a municipal wastewater treatment system must not interfere with the operation of the treatment system or cause pass-through violations of effluent limits or water quality standards.

Land application of effluent

As with the land application of dredged material, land application of effluent from the project and/or management unit may be a viable alternative for management of the effluent. Land application of effluent from a management unit or the project site requires permit authorization under an individual permit, so that appropriate environmental controls can be placed on the activity.

Management Standards

Overview

Once dredged material is excavated, it meets the definition of an “other waste” material, as defined by Minn. Stat. 115.01, subd. 9. Dredged material has the potential to affect surface and groundwater through on-land management methods if not managed in consideration of environmental risk factors.

In general, dredged material may be disposed at a permitted solid waste facility, through permitted on-site disposal, or through use or reuse for a beneficial purpose, including fill. Interim management methods, such as the short-term placement of dredged material during off-loading or re-handling activities, the temporary storage of dredged material for dewatering prior to reuse of the material, or the long-term storage of dredged material awaiting final disposal are often used for the management of dredged materials. These management methods can be used either at the dredge project site, at an off-site location, or a combination of the two.

Whether managed on-site or at another off-site location, there are a number of considerations for the proper management, mainly relating to mitigating the impact that the project and/or dredged material management area(s) have on stormwater entering, passing through or leaving the site(s).

Requirements for specific management areas are typically addressed in a dredged material management permit, either in the context of a general permit or an individual permit. A discussion of requirements for the management of dredged material, in general, follows.

Re-handling, off-loading, and transportation of dredged material

After excavation, dredged material is often placed in a temporary placement site, which may involve the re-handling, off-loading and/or transportation of dredged material. This interim management is often done to facilitate dewatering prior to final disposition of the dredged material.

Re-handling and off-loading loading activities

In general, sites for the management of dredged material must be managed to control runoff, including stormwater, from the facility to prevent the exceedance of water quality standards specified in Minn. R. chs. 7050 and 7060.

In addition, use of materials at the facility that may cause exceedances of groundwater standards specified in Minn. R. ch. 7060 must be limited and controlled. These materials include, but are not limited to, detergents and cleaning agents, solvents, chemical dust suppressants, lubricants, fuels, drilling fluids, oils, fertilizers, explosives and blasting agents.

All of the following standards apply specifically to sites used for the re-handling and off-loading of dredged material:

- Dredged materials must be managed in a manner so as to minimize the amount of material returned by spillage, erosion or other discharge to waters of the state during re-handling and/or off-loading activities.

Areas for their handling and/or off-loading of dredged material must be sloped away from surface water.

Transportation of dredged materials

All of the following standards apply specifically to dredged material transportation activities:

- Dredged materials must be managed in a manner so as to minimize the amount of material returned by spillage, erosion or other discharge to waters of the state during transportation activities.
- Dredged material hauled on federal, state, or local highways, roads, or streets must be hauled in such a way as to prevent dredged material from leaking, spilling, or otherwise being deposited in the right-of-way. Dredged material deposited on a public roadway must be immediately removed and properly disposed.

- The permittee must minimize vehicle tracking of soil or dredged material off-site at locations where vehicles exit the dredging storage.
- Tracked soil and/or dredged material must be removed from impervious surfaces that do not drain back to the dredged material storage, disposal and/or reuse facility within 24 hours of discovery, and placed in the storage, disposal and/or reuse facility site.

Temporary storage and treatment of dredged materials

Temporary storage is defined as storage of dredged material for a period of **less than or equal to one year**. Storage of dredged material at a site for more than one year, which begins when dredged material is first placed at the storage site, constitutes disposal. Note that disposal of dredged material is subject to additional standards (see discussion in the next section).

In general, sites for the management of dredged material must be managed to control runoff, including stormwater, from the facility to prevent the exceedance of water quality standards specified in Minn. R. chs. 7050 and 7060.

In addition, use of materials at the facility that may cause exceedances of groundwater standards specified in Minnesota R., ch. 7060 must be limited and controlled. These materials include, but are not limited to, detergents and cleaning agents, solvents, chemical dust suppressants, lubricants, fuels, drilling fluids, oils, fertilizers, explosives and blasting agents.

All of the following standards apply specifically to sites used for the temporary storage of dredged material and to treatment activities:

- The quantity of dredged material to be stored at the site must not exceed the quantity of material that can reasonably be managed at the site during the one year time period.
- Dredged materials must be managed in a manner so as to minimize the amount of material returned by spillage, erosion or other discharged to waters of the state.
- If dikes or berms have been constructed to contain temporary stockpiles of dredged material, they must not be removed until all material has been removed from the stockpile.

Long-term storage and disposal of dredged material

Storage of dredged material at a site for more than one year, which begins when dredged material is first placed at the storage site, constitutes disposal.

In general, sites for the management of dredged material must be managed to control runoff, including stormwater, from the facility to prevent the exceedance of water quality standards specified in Minn. R. chs. 7050 and 7060.

In addition, use of materials at the facility that may cause exceedances of groundwater standards specified in Minn. R. ch. 7060 must be limited and controlled. These materials include, but are not limited to, detergents and cleaning agents, solvents, chemical dust suppressants, lubricants, fuels, drilling fluids, oils, fertilizers, explosives and blasting agents.

Except for USACE placement sites authorized for use by the Corps in the USACE publication "Channel Maintenance Management Plan (CMMP), 4/96," sites for the long-term storage or disposal of dredged material must also meet specific requirements, which are detailed in an individual NPDES/SDS permit authorizing use of the site.

In general, the following types of standards apply to sites used for the long-term storage and/or disposal of dredged material:

- site approval
- site selection and use
- design requirements
- closure and post-closure requirements

Prior to the use of a site for the long-term storage or disposal of dredged material, it must be approved the MPCA.

Site approval

Prior to the use of a site for the long-term storage or disposal of dredged material, it must be approved by the MPCA. To request approval for a long-term storage or disposal site, an 'Initial Site Plan' must be submitted for MPCA review and approval. The 'Initial Site Plan' should be submitted with the permit application for management of dredged material.

An initial site plan consists of volume calculations for the final permitted capacity and a map of the facility. The map of the facility must include the permitted boundaries, dimensions, site contours, at contour intervals of two feet or less, soil boring locations with surface elevations and present and planned pertinent features, including but not limited to roads, screening, buffer zone, fencing, gate, shelter and equipment buildings, and surface water diversion and drainage. The initial site plan must be signed by a land surveyor registered in Minnesota or a professional engineer registered in Minnesota.

Site selection and use

Long-term storage and disposal facilities must not be sited in an area that is unsuitable because of topography, geology, hydrology, or soils.

Specifically, the facility:

- Must be located entirely above the high water table.
- Must not be located within a shoreland or wild and scenic river land use district governed by Minn. R. chs. 6105 and 6120.
- Must not be located within a wetland, unless the permittee has obtained all federal, state and/or local approvals that may be required for a particular project.
- Must be a least 50 feet from the site property line.

Design requirements

Facilities for the disposal of dredged material must be designed by a professional engineer registered in the state of Minnesota, and constructed in accordance with the design plans and specifications.

The following design standards apply to a facility used for the disposal of dredged materials:

- An earthen containment dike, or another MPCA approved embankment and/or other sediment control measure(s), must be established around the perimeter of the dredged material disposal facility (permitted waste boundary).
- Site preparation must allow for orderly development of the site. Initial site preparations shall include clearing and grubbing, topsoil stripping and stockpiling, fill excavation, if appropriate, drainage control structures, and other design features necessary to construct and operate the facility.
- The site must be developed in phases in accordance with an 'operational plan' to achieve final fill elevations as rapidly as possible. The design of each phase shall take into account weather conditions, site drainage, and the waste flow pattern into the site.

- Surface water runoff must be diverted around dredged materials disposal facilities to prevent erosion, and protect the structural integrity of exterior embankments from failure.
- Slopes and drainage ways must be designed to prevent erosion. Slopes longer than 200 feet shall be interrupted with drainage ways.
- Final slopes for the fill area must be a minimum two percent and a maximum 20 percent, and shall be consistent with the planned ultimate use for the site.
- Final cover must consist of at least 18 inches of soil with the top 12 inches capable of sustaining vegetative growth.
- For a system that will impound water (e.g. hydraulic dredging) with a constructed dike over six feet in height, or that impound more than 15 acre-feet of water, the system may be subject to state Dam Safety rules. More information about the Dam Safety Program can be found on the MDNR webpage located at: <http://files.dnr.state.mn.us/publications/waters/damperm.pdf>.
- The facility must be stabilized before any disposal in the facility is allowed:
 - The exterior slope of all permanent dikes or berms must be no steeper than three-to-one (horizontal to vertical) and be seeded with a soil fixative (e.g. mulch, blanket) applied within 72 hours of the completion of any grading work on the slopes.
 - Silt fences, if used, must be properly installed. The silt fences must be tall enough and installed at a sufficient distance from the base of the permanent dikes/berms or temporary stockpiles to create a reasonable secondary containment area.

Site management, limitations, and restrictions

A site used for the long-term storage or disposal of dredged material is regulated as a solid waste management facility. Use of the facility must proceed in an orderly, defined manner.

All of the following management standards apply to a facility used for the long-term storage or disposal of dredged material:

- Each fill phase must be outlined with grade stakes, and staked for proper grading and filling.
- All trenches or fill areas must be staked with permanent markers.
- A permanent benchmark must be installed on-site with its location depicted on the facility as-built plan.
- Run-on and run-off of stormwater must be controlled. The owner or operator must implement management practices designed to control run-on and run-off of stormwater from the disposal facility.
- Nuisance conditions resulting from the disposal of dredged material must be controlled and managed by the facility owner or operator.
- Cover slopes must be surveyed and staked during placement.
- Final closure of a dredged material disposal facility must be completed in accordance with an MPCA approved plan.

Additional standards apply to new or expanding sites used for the long-term storage or disposal of dredged material in order to prevent migration of pollutants from the site to surface water during construction activities.

The following standards apply to **new or expanding** long-term storage or disposal sites:

- The Permittee must plan for and implement construction practices that minimize erosion and maintain dike integrity.
- Erosion control measures must be established on all down-gradient perimeters prior to the initiation of any up-gradient land-disturbing construction activities.
- Surface runoff must be directed around and away from the storage and/or disposal facility site, until the site is stabilized, usually by assuring that vegetative cover is well-established.
- Sediment control practices shall be designed and implemented to minimize sediment from entering surface waters. The timing of the installation of sediment control practices may be adjusted to accommodate short-term activities such as equipment access. Any short-term activity must be completed as quickly as possible and the sediment control practices must be installed immediately after the activity is completed. However, sediment control practices must be installed before the next precipitation event even if the activity is not complete.

All erosion and sediment control measures shall remain in place until final stabilization has been established. Permanent cover or final stabilization methods are used to prevent erosion, such as the placement of rip rap, sodding, or permanent seeding or planting. Permanent seeding and planting must have a uniform perennial vegetation cover of at least 70 percent density to constitute final stabilization.

Closure and post-closure requirements

Planning for the care of a facility used for the long-term storage or disposal of dredged material after it is closed is as important as how the facility will be managed during its operational life.

Standards apply to how the facility is closed and how it is managed after it is closed to protect human health and the environment. In general terms, the facility must be closed in a manner that eliminates, minimizes, or controls the escape of pollutants to groundwater or surface waters, to soils, or to the atmosphere during the post-closure period. Specific requirements for a given site are specified in an individual permit, and provide for the following:

- closure plan
- closure procedures
- post-closure care

Standards apply to how a facility is closed and managed after closure to protect human health and the environment.

Closure Plan. A 'Closure Plan' for closure and post-closure care of long term storage and disposal facilities must be submitted for MPCA review and approval when use of the site is initiated. The 'Closure Plan' is typically submitted with the permit application for management of dredged material, and is kept on-site, along with any revisions to the Plan until the time of closure.

The 'Closure Plan' should identify the steps needed to close the entire site at the end of its operating life, and includes: a description of how and when the entire facility will be closed, along with the estimated year of closure and a schedule for completing each fill phase; an estimate of the maximum quantity of dredged material in storage at any time during the life of the facility; and, a cost estimate including an itemized breakdown for closure of each fill phase and the total cost associated with closure activities at dredged material disposal facilities.

The 'Closure Plan' must amend the plan whenever changes in the operating plan or facility design affect the closure procedures needed, and whenever the expected year of closure changes.

Closure Procedures. If closure is being initiated, the following procedures apply:

- The MPCA must be notified at least 90 days before final facility closure activities are to begin.
- The 'Closure Plan' must be implemented within 30 days of receiving the last shipment of dredged material for disposal.

- A detailed description of the waste types accepted at the facility and what the facility was used for, together with a survey plat of the site, must be submitted to the county recorder and the MPCA. The plat must be prepared and certified by a land surveyor registered in Minnesota. The landowner must record a notation on the deed to the property or on some other instrument normally examined during a title search, that will in perpetuity notify any potential purchaser of the property of any special conditions or limitations for use of the site, as set out in the 'Closure Plan' and closure document.
- A 'Certification of Closure' must be obtained from the MPCA.

Post-Closure Care. The following standards apply after final closure of a site used for the long-term storage or disposal of dredged material:

- Access to the facility must be restricted, either by the use of gates, fencing, or other means to prevent further disposal at the site, unless the site's final use allows access.
- The integrity and effectiveness of the final cover at the site must be maintained, including making repairs to the final cover system as necessary to correct the effects of settling, subsidence, gas and leachate migration, erosion, root penetration, burrowing animals, or other events.
- Prevention of run-on and run-off from eroding or otherwise damaging the final cover.
- Protection and maintenance of surveyed benchmarks used during the operational life of the facility.

Use or reuse of dredged material

Except in cases where the dredged material is heavily contaminated, the use or reuse of dredged material is a viable and suitable management method. Use or reuse of dredged material, where suitable, is highly recommended as a management option by the MPCA.

Management levels

Dredged material is categorized into one or more management levels based on the results of completed sediment characterization, that is, the type and level of pollutants in the material in comparison to established SRVs.

The Management Level of a dredged material dictates the use/reuse potential of the dredged material. Dredged Material is categorized into three Management Levels:

- Level 1
- Level 2
- Level 3

Level 1 Dredged Material is characterized as being at or below analyte concentrations for **all** of the SRVs listed in the Level 1 SRV column of Table 5.

Level 1 Dredged Material is suitable for use or reuse on properties with a residential or recreational use category.

Level 2 Dredged Material is characterized as being at or below analyte concentrations for **all** of the SRVs listed in the Level 2 SRV column of Table 5.

Level 2 Dredged Material is suitable for use or reuse on properties with an industrial use category.

Level 3 Dredged Material is characterized as having significant contamination, as demonstrated by one or more analyte concentrations being greater than the Level 2 SRV column of Table 5.

Level 3 Dredged Material is not suitable for use or reuse, and must be disposed of at an appropriate solid waste facility.

Land application of dredged material

Land application of dredged material is not commonly used and is probably most applicable to inland lake dredging projects with highly organic, mucky sediments which can be easily removed and land-applied by hydraulic pumping.

Land application of dredged material and/or effluent from a management unit or the project site requires permit authorization, except for de minimus amounts of dredged material, as described on page 5 of this document.

Land application of Level 1 and/or Level 2 (see Table 5) dredged material may be appropriate within the context of an individual permit, depending on the specific material and reuse proposal and levels of pollutants. Individual land application authorization of dredged material and/or effluent is evaluated on a case-by-case basis, with limitations based on the agronomic uptake of pollutants/nutrients by the planted crop is taken into consideration. In addition, individual permits can contain specific requirements and provisions where environmental safeguards specific to the given situation can be required and implemented. **Land application of Level 3 dredged materials is not allowed.**

Co-mingling of dredged materials

Depending on the project and sediment characterization, subsets of dredged materials may be identified, in which case, multiple Management Tiers may be applied. If subsets of Management Tiers exist within the project, dredged material may be managed separately by subsets, i.e. each subset of dredged material is managed at the relevant Management Tier; managed at the most restrictive Management Tier, if separation and management by subset is not feasible or desired; or, managed at the most restrictive Management Tier if subsets from a given project or multiple project, such as at a use/reuse staging area, are co-mingled prior to disposal.

Storage of dredged material prior to use or reuse is subject to storage requirements, based on how long the material is stored.

Storage of dredged material prior to use/reuse

The storage of dredged material prior to reuse or use is subject to the temporary storage requirements, or the long-term storage/disposal requirements, as applicable, based on the length of time the material is stored before it is used/reused.

Beach amendments

Some dredged materials may be suitable for use/reuse on beaches to replenish or prevent the erosion of beach material above the OHWL.

Use/reuse of dredged material as a beach amendment is not authorized under the context of a general permit for the management of dredged material. Use/reuse as a beach amendment is however, considered on a case-by-case basis in the context of an individual permit, where environmental safeguards specific to the given situation can be required and implemented.

In-water and deep water disposal

In-water disposal of dredged material at the same or another site may be a viable and legitimate use/reuse of a dredged material. In-water disposal differs from deep water disposal in that the dredged material is being legitimately used or reused for a specified purpose, such as fill material, whereas deep water disposal typically constitutes disposal. That is, the material is disposed of in deep water for the purposes of disposal.

Deep water disposal of dredged material is not authorized. In-water disposal of dredged material is an activity that is regulated by the MDNR and/or the USACE, depending on the destined site of placement of the dredged material. For more information on permits that may be required for this activity, refer to the 'Other Regulatory Entities' section of this document.

Considerations for off-site facilities

Even if managed at another off-site location, the generator of the dredged material, as well as the operator and/or owner of the site, if different, is responsible for the proper characterization and management of dredged material.

The generator of the waste may not relinquish control of the dredged material if there is reason to believe that it will not be managed in accordance with applicable management standards.

Sites used for the management of dredged materials must be specifically authorized to receive and manage dredged material. In most cases, this authorization comes from an NPDES/SDS dredged material permit that is issued by the MPCA; these requirements are discussed in detail in the sections that follow. In some cases however, the regulatory mechanism for this authorization does not come from a dredged material management permit.

USACE placement sites

The USACE has extensively reviewed sites that are suitable for dredged material management in the St. Paul District; suitable sites are compiled in the USACE publication "Channel Maintenance Management Plan (CMMP), 4/96." An electronic version of this document can be located on the USACE website located at:

<http://www.mvp.usace.army.mil/navigation/default.asp?pageid=167&subpageid=321>.

Use of an USACE placement site does not require re-approval of the site, but must be approved in the Corps' CMMP document and indicated in the permit for the dredged material

Each suitable site is identified by name and number, and is graphically represented with specific boundaries and characteristics on a site map. A given site may or may not be owned and/or operated by the USACE, and may or may not have been used for dredged material management in the past.

Sites identified by the USACE as suitable for dredged material management may be used for dredged material management under the context of a dredged material management permit, notwithstanding a discharge from the site, without being re-approved by the MPCA. Although these sites are, in essence, pre-approved, a given site must be identified in the permit for a given project prior to using the site.

MPCA permitted solid waste facilities

In some cases, management of dredged material at an MPCA permitted solid waste facility may be a desirable management method. In order to dispose of dredged material at a solid waste facility, the facility must be permitted to receive the waste – recall that dredged material meets the definition of a solid waste. For permitting, a facility must have an approved industrial waste management plan that identifies where and how industrial waste at the facility will be managed; dredged material must be explicitly authorized for disposal at the facility prior to disposal of the dredged material.

A separate permit is not required for the disposal of dredged material at a solid waste management facility with an approved industrial waste management plan for dredged material, notwithstanding a discharge from the site or other activities requiring a permit.

A listing of MPCA permitted solid waste facilities is listed in the appendices section of this document, or can be located electronically at the MPCA webpage located at:

<http://www.pca.state.mn.us/publications/reports/solidwaste-facilitylist.pdf>.

The generator of the waste is responsible for ensuring that the facility has an approved industrial waste management plan for the disposal of dredged material.

Permitting and Other Forms

Overview

The MPCA's permitting role in the dredge program is for authorizing the on-land disposal or reuse of dredge materials, not the dredge activity itself. In-water disposal of dredged material is an activity that is regulated by the MDNR and/or the USACE, depending on the destined site of placement of the dredged material.

In cases where a permit is not required, a notification to manage dredged materials without a permit (Notification) must be completed and submitted. See page 2 for permit criteria

Permit application

To apply for a permit to manage dredge materials and/or discharge effluent from the dredge project site and/or management unit(s), the appropriate forms should be completed and submitted at least 180 days before the anticipated date of dredging, to allow ample time for processing of the permit.

Current versions of permitting forms are maintained on the MPCA website located at:

<http://www.pca.state.mn.us/water/permits/index.html>.

The following forms are applicable to dredge projects:

- Water Quality Transmittal Form (<http://www.pca.state.mn.us/publications/forms/wq-wwprm7-03.doc>)
- Attachment for Dredged Material Management (<http://www.pca.state.mn.us/publications/forms/wq-wwprm7-26.doc>)

The Permittee should fill in all blanks in the form, using 'Not Applicable' (N/A) to show that a response has been made. It is the responsibility of the applicant to fill out the application forms and attachments completely and accurately. Filling out the application completely means that there are no blank lines and all requested information has been provided. Incomplete applications will be returned.

Send the completed permit application, attachments (including plans and specifications, if applicable), and the applicable permit application fee as indicated on the Transmittal Form to:

Minnesota Pollution Control Agency
Beckie Olson, Permit Document Coordinator
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Checks should be made payable to the MPCA. Applications that are submitted without an authorized signature, the required application fee, and applicable attachment(s) will be returned.

Upon receipt of a completed application, MPCA staff will review the application and determine whether the activity can be covered under the general permit to manage dredged material, or whether it needs to have individual permit coverage. If a specific activity does not meet the applicability criteria set forth in the general permit, coverage cannot be granted, and would have to be covered under an individual permit.

Notification to managed dredged material without a permit (notification)

For projects not requiring a permit, information pertaining to the project is recommended to be submitted to the MPCA for review prior to initiation of dredge activities. A Notification to Manage Dredged Material without a Permit (Notification) is used for this purpose, and should be submitted **at least** 30 days prior to the initiation of dredge activities.

- Current versions of dredged materials publications are maintained on the MPCA website located at: <http://www.pca.state.mn.us/water/dredgedmaterials.html>.

If, after review of the Notification submitted, the Agency does not concur with your determination that a permit is not required for the project, the Agency will notify you of this determination within the 30 day time period. Dredging activity may not commence until the discrepancy has been resolved and a permit issued for the project, if required.

Annual dredged material report form

An annual report detailing the generation and disposition of dredged material is required for projects requiring a permit, even if no dredging occurred during the preceding calendar year.

Annual Dredged Material Reports are due by February 1 of each year for the preceding calendar year.

Note: The annual dredged material report form is only required for permitted projects.

Current versions of dredged materials publications are maintained on the MPCA webpage located at: <http://www.pca.state.mn.us/water/dredgedmaterials.html>.

The annual 'Dredged Material Report' must be done on an MPCA form must include the following information:

- Dates of dredging.
- Volume of material placed into storage or disposal facility.
- Any incidents, such as spills, unauthorized discharge and/or other permit violations which may have occurred.
- Water level records for the disposal facilities of hydraulic dredging projects.
- Such information as the MPCA may reasonably require of the Permittee pursuant to Minn. R. 7001 and Minn. Stat. chap. 115 and 116 as amended.
- For disposal facilities, the dates of 'Periodic Site Inspections' and the status of erosion control measures at the disposal facility.
- For disposal facilities, the dates, the volume of dredged material removed from the disposal facility, and the method and location of the disposition (disposal or reuse) of such materials.
- For facilities that used or reused dredged material during the previous calendar year, the report must also include:
 - A written description of the use or reuse of the dredged material.
 - A written determination of the use category and appropriate Soil Reference Values.
 - The results of an evaluation of the level of contaminants in the dredged material proposed for reuse for the respective SRVs.

Modified characterization and permit approach for urban stormwater ponds

Sediment characterization

This section specifically addresses the process to be used for municipal or urban stormwater systems. The modified permit process and requirements are described below. Protocols for the baseline sampling parameters in sediment, as described previously, have been modified for projects involving the removal and management of sediment from an urban stormwater treatment system. A stormwater system will accumulate sediment in many different parts of a stormwater system including stormwater ponds, sediment basins, or other management practices used to pre-treat stormwater in a treatment train approach. For simplicity all are hereafter referred to as stormwater ponds that may or may not be a part of a Municipal Separate Storm Sewer System (MS4). The baseline set of parameters identified in the Dredge Manual are modified here based on current knowledge of typical urban stormwater runoff and appropriate consideration of the environmental risk associated with sediment from stormwater systems.

Because the land use within the drainage area of a stormwater pond can be unique you must also consider and use the sediment risk assessment approach. Use the risk assessment process to evaluate the land use types within the drainage area for each stormwater pond to determine if the parameter list should be supplemented. The risk assessment and the sampling process will determine if the sediment can be re-used, with or without restrictions. The sediment removed may be re-used as fill material, treated for reuse by a proven method or disposed of in a permitted lined landfill. It is important that the risk be properly assessed to avoid the cost of future cleanup or other future liability. The sediment generator (owner of the stormwater facility) may be held responsible for damages or future liability due to improper evaluation, reuse or placement of contaminated sediment. If it is determined early in the

process that all the sediment is to be removed and disposed of in a permitted landfill then the sample parameter list may be altered as necessary to meet the landfill facility requirements. The MPCA will monitor sample results and may modify the baseline list of parameters in the future. The current baseline parameters are as follows (check the MPCA website periodically for an updated parameter list to determine if any parameters have been added or removed:

- Copper
- Arsenic
- Polycyclic Aromatic Hydrocarbons (PAHs), both carcinogenic and non-carcinogenic

This information in this section should be used for planning your sampling, laboratory analysis and finally for data analysis and decision making on stormwater pond sediments.

The list of PAHs for analysis includes both non-carcinogenic PAH and carcinogenic PAH (cPAH) chemicals. Minnesota uses Potency Equivalency Factors (PEFs) to evaluate the toxicity and to assess the risk associated with cPAHs. A PEF is a relative estimate of toxicity for a chemical compared to a reference chemical. Benzo (a) pyrene (BaP) was chosen as a reference chemical for cPAHs because its toxicity is well characterized. The BaP equivalents are further explained in fact sheets and guidance found on the MPCA website.

A spreadsheet can be used to calculate **BaP Equivalents for PAHs** for sediment samples. The spreadsheet can be set up to multiply the laboratory sample result for each parameter by the Potency Equivalency Factor (PEF). The products are summed to determine the BaP Equivalent for each sample allowing comparison to the SRVs and management levels described below.

When the laboratory detects a cPAH present in the sample at a concentration greater than the Method Detection Level (MDL) but less than the Reporting Limit (RL), a specific procedure must be followed to complete the analysis. In some cases the laboratory may detect the presence of the chemical but must provide an estimate of the concentration level for that parameter in the sample. When this occurs the laboratories are supposed to use a "J" flag on lab sheets to indicate that the value is an estimate between the MDL and RL. Laboratory reports must be attached to the permit application and the MPCA also requests that the permittee highlight any value on the data summary sheet when a "J" flag is needed. For purposes of the BaP calculation when the lab reports a value between the MDL and the RL, the MPCA policy for storm ponds is to substitute one-half (1/2) the reporting limit for the estimated sample result and that value will be multiplied by the PEF to calculate the BaP equivalent. A template for the spreadsheet to summarize sediment sample data is provided on the Stormwater MS4 web page of the MPCA website.

As background information on this policy, there are at least three (3) ways of handling values below the RL (sometimes also labeled as Non-Detects (ND)) to calculate the BaP equivalents:

1. The most conservative is to substitute or use the value of reporting limit as the value in the BaP calculation
2. Substitute one-half (1/2) the reporting limit in the BaP calculation
3. Use a zero for the sample value in the BaP calculation

For purposes of storm pond dredging decisions and using the summary spreadsheet, please use method #2. This will require the permittee to change the formula in spreadsheet from the (estimated parameter value times the PEF) to (0.5 times the Reporting Limit times the PEF). The existing formula in the template provided will need to be changed for each of the appropriate cells within the range of cells AE29 to AN53 from the default formula to the formula appropriate for a "J" flagged value. Those sample results with received a "J" flag and should be highlighted with the appropriate background color on the spreadsheet for clarity and transparency purposes.

The permittee may attach a narrative comparing the outcome with calculations using all three (3) methods and a recommended course of action if desired. Always provide units for all factors and report sample results on a **dry weight basis in mg/kg** unless otherwise noted.

Storm pond sampling

Regardless of the volume of sediment to be removed, it is important to determine if the sediment presents a potential adverse impact to human health or the environment. Proper risk evaluation, sampling protocol and site consideration for where the sediment will be reused or disposed is necessary. Observing and testing for the particle size is often a cost effective way to begin characterization of dredge material. You may want to consider collecting samples for particle size evaluation during pond surveys or inspections to help in advance with maintenance activity planning. Visual and physical observation of sediment may reveal that sediments are too fine to justify the cost of particle size sample analysis. If, however, the particle size distribution test indicates that 93 percent or more of the sediment is retained on a #200 sieve, then it is helpful to know this factor early in the project planning. When the sediment is 93 percent or more sand, then the sediment is unlikely to be contaminated and chemical laboratory analysis will not be required. The MPCA does not require a permit or reporting of results for small maintenance projects, however, the process described herein is provided to ensure that proper consideration is given to potential impacts of sediment material. Use Table 7 below in place of Table 6 of the Dredge Manual to determine the number of cores and sediment samples recommended evaluating for stormwater facility maintenance.

Each stormwater pond may have unique characteristics which makes it very difficult to provide guidance on sampling locations; use good professional judgment for selecting the number and location of core samples. Core sampling is the most accurate method for storm pond sediment sampling. The minimum recommendation is to obtain one composite sample for each two (2) feet of sediment. Also be aware that if there are significant changes in sediment color or texture the contaminant level may also change. While core samples are preferred, other appropriate sampling methods may be utilized if the method is described in the field notes. A sediment (boring) log should describe the equipment, changes in color and texture of the sediment sampled. Sampling is not required for small removals of individual sediment deltas by pond inlets or outfalls. Sampling is recommended if maintenance is performed at multiple inlet locations and if the material consolidated at one location is greater than 500 cubic yards. Sediment from maintenance of individual stormwater inlets and outfalls may be combined and stockpiled for composite sampling as one project if desired (refer to Management Levels section regarding co-mingling different management levels). This information should be kept as a part of your MS4 maintenance records.

This procedure requires review of the sediment sample data and permit application review **only** when project maintenance activity exceeds an estimated 3,000 cubic yards **and** chemical sample data indicate that the dredge material **exceeds** management level 1 (see When a Permit Required is).

Maintenance projects planned to dredge sediment from multiple ponds should be evaluated and sampled separately, however, the projects can be consolidated into one permit application. When sediment is observed in the field to be mostly fine particles, sediment should be tested for contaminant levels and the test for particle size distribution can be eliminated if it will not contribute to decision making for reuse. Samples must be representative of the material to be dredged. An evaluation of past and current land use along with a risk assessment of pollutant sources is needed to identify additional parameters for lab testing. Information on location and depth of samples must be included on a site map and attached to the application. Project managers must use good professional judgment to develop a reasonable sampling plan. In some cases the minimum number of core samples below may not be adequate to obtain representative samples and properly characterize the dredge material. It is the responsibility of the generator of the dredge material to properly characterize the material to be dredged. Results from all samples collected and analyzed must be submitted to MPCA when a permit application review is required. Table 7 uses dredge volume to establish sampling and permit requirements.

Table: 7 Minimum recommended number of samples and permit requirements

Estimated Volume of Dredge Material (cubic yards)	Number of samples for Particle Size Distribution recommended	Maintain records at the MS4	Minimum recommended number of samples for analysis	Permit review required if >3000 cubic yards of sediment & exceeds level 1
0 to 100	0	Y	0	
100 to 500	1	Y	1	
500- to 3,000	2	Y	2	
3,000-30,000	3	Y	3	Y
30,000-100,000	5	Y	5	Y
100,000-500,000	6	Y	6	Y
500,000-1,000,000	8	Y	8	Y
1,000,000	X>8	Y	>8	Y

Management levels

Laboratory results from the completed sediment characterization are used to determine the management level; management levels are determined by MPCA based on established SRVs. For more detail on SRVs refer to the item labeled “Risk-Based Guidance for the Soil - Human Health Pathway” on the MPCA website at: <http://www.pca.state.mn.us/cleanup/riskbasedoc.html>. Based on sample results dredged material may be segregated and handled in one or more management levels. The management level of a dredged material determines the appropriate handling and disposition of the material. Larger projects may produce dredge materials that can be segregated for health, environmental or economic reasons into volumes of sediment that have distinctly different particle sizes and/or contaminant levels from each other. Subsets of dredged material may be managed in a different manner. **Avoid mixing sediment with high levels of contamination with low level contaminated material.** If sediments of different management levels are co-mingled prior to disposal they must be managed at the highest management level measured. Stormwater pond sediments are categorized into the same three management levels as other dredge material; for stormwater ponds management level 3 is modified as follows:

- Level 3 Dredged Material is characterized as having significant contamination and must be managed appropriately for the specific contaminants present. If PAHs are the only contaminants present at Level 3 they may be treated to reduce the contaminant levels by a proven treatment method if there is an operating permitted facility. Level 3 materials may also be reused or disposed of at a permitted landfill with an approved industrial waste management plan.

When is a permit required for stormwater pond dredging?

Stormwater ponds and similar facilities are part of the stormwater management system permitted under the NPDES/SDS program (refer to Minn. R. ch. 7090 for Stormwater permit requirements). Maintenance of stormwater facilities is required by the MS4 permit conditions in Minimum Control Measures five and six of the MS4 Permit (see parts V.G.5. and V.G.6). The MS4 General Permit issued in 2006 does not address the sediment dredging approval process specifically as a maintenance activity.

Beware that it is a violation of water quality rules to discharge turbid water from dewatering or dredge activity to a water resource without a permit. The water level in the stormwater pond must be maintained below the pond outlet for the duration of activity, protected or controlled to prevent turbid discharge in some other manner. BMPs for erosion and sediment control are necessary because dredge operations may cause the disturbance of soil around the facility as well as the location where sediment is reused or it is placed as fill material. Soil disturbing activity requires an NPDES/SDS Permit for

Construction Stormwater (CSW) Permit when more than one acre will be disturbed. In cases where more than one acre of soil is disturbed a CSW Permit will be required for the location where the dredge material is placed for reuse or as fill material. The MPCA does not require a CSW permit application if storm pond dredge material is taken to a permitted lined landfill. Other types of permits may be required for a site where treatment of the dredge material is to occur. A CSW Permit or Dredge Supplemental form as described below is **not** required if dredged material is reused at an MPCA permitted facility. Notification is not required for a storm pond dredge project if does not meet the criteria below. It is recommended that records of all dredge projects be maintained by the owner and operator of stormwater facilities.

The MPCA requires a CSW Permit Application, **Stormwater Facility Dredge Project Supplement form** (Dredge Supplement form) and stormwater pond sample data for review when the:

- a) sample results exceed management level 1
- b) estimated dredge volume exceeds 3000 cubic yards
- c) sediment is *not* going to a lined landfill or a permitted treatment/processing facility

For question number 9 – “project type” - on the CSW Permit Application form marks the “other” box and insert “dredge” into the explanation box. The Dredge Supplement form gathers information specific to the activity at the storm pond location. Permittees should receive a CSW Permit coverage letter within 7 days if all the information requested is clearly presented in the Dredge Supplement form and attachments. Sampling recommendations, records retention and sample data review requirements are based on project size criteria found in the previous chart. In situations where a permit application and review is not required, this information is considered part of the MS4 maintenance records and therefore MS4 Permittee must collect the information and keep all sampling and maintenance records on file for internal review, decision making and tracking of sediment disposal. The same procedures and record keeping are recommended for owners and operators not required to obtain and MS4 Permit.

On page 4 of the Dredge Supplement form there is a check list of information and attachments that must be submitted with a permit application. This information is needed for each stormwater pond to be dredged along with the laboratory reports:

1. Detailed map showing pond location, inlet(s) and outlet(s), sample locations, pond name or ID number. For example, this map can be placed on an aerial photo, GIS based map or storm sewer map.
2. As part of the narrative requested in question 4a, on the dredge supplement form, identify the stormwater drainage area (storm-shed) for each pond in acres and significant land uses.
3. In the narrative for 4a, provide the surface area of each pond in acres; average design depth and sediment depth before removal, in feet.
4. Approximate date of construction and last sediment removal action from stormwater pond

Lab data sheets must be submitted. A Storm Pond Data Summary Table in spreadsheet format is provided on the MPCA MS4 website under Revised Permit and Program forms:

<http://www.pca.state.mn.us/water/stormwater/stormwater-ms4.html> for a convenient way to summarize and graphically represent the sample data for review and decision making. In the future to improve turn-around time and efficiency, the MPCA is considering use of a website for dredge sample data entry and analysis.

Appendices

Definitions

Agency means the Minnesota Pollution Control Agency (MPCA).

Beach Nourishment means the disposal of dredged material on the beaches or in the water ward starting at or above the OHWL for the purpose of adding to, replenishing, or preventing the erosion of, beach material.

Beneficial Re-use means the re-use of dredged material, after the material has been dewatered, in projects such as, but not limited to: road base, building base or pad, etc.

BMPs means practices to prevent or reduce pollution of the waters of the state, including schedules of activities, prohibitions of practices, and other management practices and also includes treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge, or waste disposal or drainage from material storage, as defined in Minnesota R. pt. 7001.1020, subp.5.

Carriage, or Conveyance, Water means the water portion of a slurry of water and dredged material.

Carriage Water Return Flow means the carriage water which is returned to receiving water after separation of the dredged material from the carriage water in a disposal, re-handling or treatment facility.

Construction Activity means a disturbance to the land that results in a change in the topography, existing soil cover (both vegetative and non-vegetative), or the existing soil topography that may result in accelerated stormwater runoff, leading to soil erosion and movement of sediment into waters of the state. Examples can include clearing, grading, filling and excavating.

Design capacity means the total volume of compacted dredged materials, along with any topsoil, intermittent, intermediate, and/or final cover, as calculated from final contour and cross-sectional plan sheets that define the areal and vertical extent of the fill area.

Discharges of Dredged Material means any addition of dredged material into waters of the state and includes discharges of water from dredged material disposal operations including beach nourishment, upland, or confined disposal which return to waters of state. Material re-suspended during normal dredging operations is considered "de minimis" and is not a dredged material discharge.

Disposal Facility means a structure, site or area for the disposal of dredged material.

Dredged Material means any material removed from the bed of any waterway by dredging.

Dredging means any part of the process of the removal of material from the beds of waterways; transport of the material to a disposal, re-handling or treatment facility; treatment of the material; discharge of carriage or interstitial water; and disposal of the material.

Erosion Control means methods employed to prevent erosion. Examples include: soil stabilization practices, horizontal slope grading, temporary or permanent cover, and construction phasing.

Final Stabilization means that all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover (a density of 70 percent cover for unpaved areas and areas not covered by permanent structures) has been established or equivalent permanent stabilization measures have been employed. Examples of vegetative cover practices can be found in Supplemental Specifications to the 1988 Standard Specifications for Construction (Minnesota Department of Transportation, 1991).

Flood Event means that the surface elevation of a water body has risen to a level that causes the inundation or submersion of areas normally above the Ordinary High Water Level.

Grain Size Analysis means a method to determine dredged material and disposal site sediment particle size distribution.

Hazardous Waste has the meaning given in Minn. Stat. §116.06, subd. 11.

Impervious Surface means a constructed hard surface that either prevents or retards the entry of water into the soil and causes water to run off the surface in greater quantities and at an increased rate of flow than prior to development. Examples include: rooftops, sidewalks, patios, driveways, parking lots, storage areas, and concrete, asphalt, or gravel roads.

Impoundment means a natural or artificial body of water or sludge confined by a dam, dike, floodgate, or other barrier.

Interstitial, or Pore, Water means water contained in the interstices or voids of soil or rock in the dredged material.

MPCA means the Minnesota Pollution Control Agency, or Minnesota Pollution Control Agency staff as delegated by the Minnesota Pollution Control Agency.

Ordinary High-Water Level (OHWL) means the boundary of water basins, watercourses, public waters, and public waters wetlands, and shall be an elevation delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the ordinary high water level is the elevation of the top of the bank of the channel. For reservoirs and flowages, the ordinary high water level is the operating elevation of the normal summer pool. (Minn. Stat. §103G.005 subd. 14 and Minn R. 6120.2500 subp. 11.)

Pollutant means any sewage, industrial waste, or other wastes, as defined in Minnesota Statutes permit 115.01, discharged into a disposal system or to waters of the state.

Re-handling Facility means a temporary storage site or facility used during the transportation of dredged material to a treatment or disposal facility.

Run-off means any liquid that drains over land from any part of a facility.

Run-on means any liquid that drains over land onto any part of a facility.

Sediment means the unconsolidated inorganic and organic material that is suspended in and being transported by surface water, or have settled out and has deposited into beds.

"Significant Storm Event" means a storm event that is greater than 1.0 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 1.0 inch rainfall) storm event. The 72-hour storm event interval may be waived where:

- a. The preceding measurable storm event did not result in a measurable discharge from the facility.
- b. The Permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted.

Solid waste means garbage, refuse, sludge from a water supply treatment plant or air contaminant treatment facility, and other discarded waste materials and sludge's, in solid, semisolid, liquid, or contained gaseous form, resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include hazardous waste; animal waste used as fertilizer; earthen fill, boulders, rock; sewage sludge; solid or dissolved material in domestic sewage or other common pollutants in water resources, such as silt, dissolved or suspended solids in industrial waste water effluents or discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended, dissolved materials in irrigation return flows; or source, special nuclear, or by-product material as defined by The Atomic Energy Act of 1954, as amended. (Minn. R. 7035.0300, subp. 100.)

Stabilized means staked sod, riprap, wood fiber blanket, or other material that prevents erosion from occurring has covered the exposed ground surface. Grass seed is not stabilization.

Storage Facility means a structure, site or area for the holding of dredged material for more than 48 hours in quantities equal to or greater than ten cubic yards. Storage for more than 1 year constitutes disposal.

Treatment Facility in this permit means a natural or artificial confinement structure, site or area used for the separation of dredged material solids from the interstitial or carriage water.

Unconfined Disposal means the deposition of dredged material, in water, on the bed of a waterway.

Upland Disposal means the disposal of dredged materials landward from the ordinary high-water level of a waterway or water body.

Waters of the State means all streams, lakes, ponds, marshes, wetlands, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof.

Water table means the surface of the groundwater at which the pressure is atmospheric. Generally this is the top of the saturated zone.

Wetlands means those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Constructed wetlands designed for wastewater treatment are not waters of the state. Wetlands must have the following attributes:

- a. a predominance of hydric soils
- b. inundated or saturated by surface water or groundwater at a frequency and duration to support a prevalence of hydrophytic vegetation typically adapted for life in a saturated soil condition
- c. under normal circumstances support a prevalence of such vegetation

Best Management Practices for the management of dredged material

Current versions of dredged materials publications are maintained on the MPCA webpage located at: <http://www.pca.state.mn.us/water/dredgedmaterials.html>.

MNG990000 general permit authorization to manage dredged material

General permit number MNG990000 was previously in place to authorize the management of dredged material for sites or projects meeting the criteria outlined in the permit. As of the publication date of this document, the permit is expired and is in the process of being reissued.

MPCA permitted disposal facilities accepting mixed municipal solid waste (June 2009)

SW-87

Blue Earth County/ Ponderosa Sanitary Landfill
Scott Fichtner
507-389-8381
Blue Earth County Govt. Center
410 South 5th St.
PO Box 3566
Mankato, MN 56002

SW-89

Brown County Sanitary Landfill
Jane Starz
507-233-6644
PO Box 248
New Ulm, MN 56073-0248

SW-56

Burnsville Landfill Inc.
Mike Niewind
952-890-3248
2650 Cliff Rd W
Burnsville, MN 55337

SW-34

Clay County Sanitary Landfill
Kathy Maher
218-299-5002
805 11th Ave N
Moorhead, MN 56560

SW-143

Cottonwood County Sanitary Landfill
Mike Kirchmeier
507-831-2441
1355 9th Ave
Windom, MN 56101

SW-376

Crow Wing Sanitary Landfill
Doug Morris
218-828-2971
Crow Wing County
301 Laurel Street
Complex West
Brainerd, MN 56401

SW-017

East Central Sanitary Landfill
Allen P. Bonini
320-679-4930 x 102
East Central SW Commission
1756 - 180th Ave.
Mora, MN 55051-9802

SW-074

Elk River Sanitary Landfill
Deb Dehn
763-441-2106
22460 Highway 169 Northwest
Elk River, MN 55330

SW-015

Greater Morrison County Sanitary Landfill
Steve Backowski
320-632-2941 x. 122
Morrison County Public Works
Morrison County Courthouse
Little Falls, MN 56345

SW-079

Kandiyohi County Sanitary Landfill
Jeff Bredberg
320-231-6229
Kandiyohi County
505 Southwest Becker Ave.
PO Box 936
Willmar, MN 56201

SW-23

Lyon County Sanitary Landfill
Paul Henriksen
507-537-6733
504 Fairgrounds Rd.
Marshall, MN 56258

SW-92

Mar-Kit Sanitary Landfill
Gary Rice
218-843-2113
Kittson County
Route 1
Hallock, MN 56728

SW-11

Nobles County Sanitary Landfill
Eric Joens
507-376-9218
Nobles County
1224 2nd Ave
Worthington, MN 56187-2911

SW-355

Olmsted County - Kalmar Sanitary Landfill
Gene Mossing
507-285-8232
Olmsted County
2122 Campus Drive SE
Rochester, MN 55904

SW-045
Pine Bend Sanitary Landfill
Michael Ayers
651-457-2778
2495 East 117th Street
Inver Grove Heights, MN 55077

SW-124
Polk County Sanitary Landfill
Willard Wilson
218-435-6501
PO Box 605
Fosston, MN 56542

SW-90
Renville County Sanitary Landfill
Marlin Larson
320-523-3676
500 E DePue Ave
Olivia, MN 56277

SW-123
Rice County Sanitary Landfill
Mike Cook
507-332-6833
Courthouse
3800 E 145th St

SW-006
Spruce Ridge Resource Mgmt Facility
Mark Reinert
320-864-5504
Spruce Ridge Resource Mgmt.
McLeod Landfill Inc.
Rte 3, Box 70A
Glencoe, MN 55336

SW-131
Steele County Sanitary Landfill
Scott Goldberg
507-451-4842
Steele County Courthouse
590 Dunnell Drive
PO Box 890
Owatonna, MN 55060

SW-405
St. Louis County Regional Solid Waste Disposal
Ted Troolin
218-749 9703
Northland Office Building
307 1st St South, Suite 115
Virginia, MN 55792Dundas, MN 55019

Internet links and other resources

MPCA Dredged Material Management Page

Link: <http://www.pca.state.mn.us/water/dredgedmaterials.html>.

U.S. EPA Overview of Dredged Material Management Programs

Link: <http://www.epa.gov/glnpo/sediment/gltem/regul.htm>.

USACE Channel Maintenance Management Plan (CMMP)

Link: <http://www.mvp.usace.army.mil/navigation/default.asp?pageid=167&subpageid=321>.

Resources for requirements of other regulatory entities

USACE Regulatory Programs Information

Link: <http://www.mvp.usace.army.mil/regulatory/>.

USACE Listing of Permitting Staff for Minnesota Counties

Link: <http://www.mvp.usace.army.mil/regulatory/default.asp?pageid=687>.

USACE Listing of Useful Links

Link: <http://www.mvp.usace.army.mil/regulatory/default.asp?pageid=678>.

MDNR Public Waters Work Permit Information and Forms

Link: http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/requirements.html.

MDNR Aquatic Plant Management Permit Information and Forms

Link: <http://www.dnr.state.mn.us/shorelandmgmt/apg/permits.html>.

MDNR Fisheries Related Permit Information and Forms

Link: <http://www.dnr.state.mn.us/permits/fishery/index.html>.

MDNR Dam Safety Program Information

Link: <files.dnr.state.mn.us/publications/waters/damperm.pdf>.

401 Certification Program Information

Link: <http://www.epa.gov/glnpo/sediment/gltem/sec401.htm>.

Link: <http://www.pca.state.mn.us/water/401.html>.

MPCA Construction Stormwater Permit Information and Forms

Link: <http://www.pca.state.mn.us/water/stormwater/stormwater-c.html>

Environmental Review Information

EQB Link: <http://www.eqb.state.mn.us/program.html?ld=18107>.

MPCA Link: http://www.pca.state.mn.us/programs/envr_p.html.

Resources for completing site assessments

MPCA Guidance for Completing Phase I Investigations

Link: <http://www.pca.state.mn.us/publications/vic-gd8.pdf>.

MPCA "What's in My Neighborhood?"

Link: <http://www.pca.state.mn.us/backyard/neighborhood.html>.

MPCA Permitted Mixed Municipal Solid Waste Facilities

Link: <http://www.pca.state.mn.us/publications/reports/solidwaste-facilitylist.pdf>.

Mapped locations of former Manufactured Gas Sites in Minnesota

Link: <http://www.hatheway.net>.

Resources for dredged material characterization

MPCA Listing of Web References for Evaluating Contaminated Sediments

Link: <http://www.pca.state.mn.us/water/sediments/links-assessment.html>.

Sediment Sampling and Evaluation Guidance

U.S. EPA, U.S. Army Corps of Engineers, 1998. Evaluation of Dredged Material Proposed For Discharge in Waters of the U.S. - Testing Manual: Inland Testing Manual. EPA-823-B-98-004. Washington, D.C.

Link: <http://www.epa.gov/ost/itm/itmpdf.html>.

U.S. EPA, 2001. Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual. EPA 823-B-01-002. Washington, D.C.

Link: <http://www.epa.gov/waterscience/cs/collection.html>.

Wastewater and Upland Disposal Guidance, including Elutriate Testing

US Army Corps of Engineers, January 2003. Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities — Testing Manual. ERDC/ EL TR-03-1.

Washington, D.C.

Link: <http://www.el.erdc.usace.army.mil/dots/pdfs/trel03-1.pdf>.

Wisconsin Department of Natural Resources, 1997. Interim Guidance on the Use of Leaching Tests for Unsaturated Contaminated Soils to Determine Groundwater Contamination. PUBL RR-523-97. Bureau of Remediation and Redevelopment. Madison, WI.

Link: <http://www.dnr.state.wi.us/org/aw/rr/archives/pubs/RR523.pdf>.

Links to permitting forms

MPCA Water Quality Transmittal Form

Link: <http://www.pca.state.mn.us/publications/forms/wq-wwprm7-03.doc>.

MPCA Attachment for Dredged Material Management

Link: <http://www.pca.state.mn.us/publications/forms/wq-wwprm7-26.doc>.