

Decision Making Process for Dredged Material Management



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Preface

The Great Lakes Dredging Team is a partnership of federal and state agencies created to assure that the dredging of U.S. harbors and channels throughout the Great Lakes, Connecting Channels and tributaries is conducted in a timely and cost effective manner while meeting environmental protection, restoration, and enhancement goals. The Team was formed in 1996 in response to the recommendations from the Interagency Working Group on the Dredging Process, which released a report of its findings in December 1994. The Working Group recommended that "National Dredging Team and Regional Dredging Issue Teams be established to provide a mechanism for timely resolution of conflicts by involving all agencies, and maximizing interagency coordination."

The Great Lakes Dredging Team is composed of representatives from the following agencies and states:

Corps of Engineers	State of Illinois
Environmental Protection Agency	State of Indiana
Fish & Wildlife Service	State of Michigan
Maritime Administration	State of Minnesota
Natural Resource Conservation Service	State of New York
National Oceanic & Atmospheric Admin.	State of Ohio
	Commonwealth of Pennsylvania
Great Lakes Commission	State of Wisconsin

The Great Lakes Dredging Team has adopted a charter and work plan which are built around four main roles: advocate for dredging in Great Lakes region; facilitator in resolving regional dredging issues; implementor of recommendations from Working Group report, and; communicator with stakeholders and public. The Team has identified a number of dredging-related issues considered of regional importance, and this report was prepared in relation to all three: Dredged Material Management Plans, consistency and changes in regulatory requirements, and public outreach.

Additional information about the Great Lakes Dredging Team and on the decision making process for dredged material management are available on the Dredging Team's Internet home page:

www.glc.org/projects/dredging

Decision Making Process for Dredged Material Management

1. **Purpose.** Bottom sediments are dredged from the Great Lakes and its tributaries for a variety of purposes, including navigation maintenance, flood protection, waterfront construction, infrastructure, and environmental remediation. The management of dredged material is potentially regulated by a diverse mixture of federal, state and local statutes and the decision making process that is applied to determine if a dredging project is justified and the appropriate method(s) for disposal of dredged material will vary with the purpose(s) of the project and its proponents. This paper was prepared for the Great Lakes Dredging Team in order to describe the decision making process used by the U.S. Army Corps of Engineers (USACE) to determine the appropriate method(s) for management of dredged material from Federal navigation projects, to describe the key environmental laws and regulations involved in this process, and to identify the roles and responsibilities of other federal and state resource agencies and local proponents in this decision making process. Some aspects of this decision making process are applicable to dredging conducted by non-federal interests.

2. **Dredging Needs.** The USACE annually expends approximately \$20 million for maintenance dredging at Great Lakes harbors and channels. On average, about 4 million cubic yards of sediments are dredged from 35 federal navigation projects each year. These projects have been authorized by Congress with specific project limits; widths, lengths and depths. Congress authorized the USACE to maintain these projects for safe navigation use, but this does not necessarily require that the USACE maintain all parts of the harbor or channels at authorized dimensions. Many Great Lakes harbors that were Congressionally authorized in the 19th century no longer have vessels requiring commercial navigation depths, and it would be a waste of limited resources to maintain these channels at authorized depths.

Dredging needs are typically determined by USACE district offices through an ongoing communication with commercial and recreational navigation users and local or state agencies responsible for harbor or port facilities. The USACE collects bathymetric data at many harbors and channels on an annual basis, and long-term trends for shoaling are determined from this data, previous dredging records, and information supplied by users. Channel depths and widths may be maintained at less than authorized dimensions because there is no need for larger channels by users or in order to reduce the volume of sediments dredged because of disposal site limitations.

Funds for dredging and dredged material management at Federal navigation projects are a part of the USACE annual Operations and Maintenance (O&M) budget. This budget is initially prepared at the project level by the district Operations Project Manager (OPM) and contains numerous items of required work (i.e., surveys, sampling and testing, environmental compliance, design, plans and specifications, dredging contracts, etc.) . The OPM submits his work for review and approval to higher levels of authority. It generally takes about 12-14 months from the initial stages of budget development by the OPM to when the President releases his budget to Congress.

It takes another 8 months for project funds to be appropriated by Congress and signed into law by the President. This translates into about a 20-22 month process from initial budget development to when the project receives its funds.

It is recognized that work required at a project can change from the time it is scheduled to when funds are actually received. Unforeseen emergencies, equipment failure, or unanticipated changed conditions occur from time to time in a program as complex as O&M. Congress recognizes the need for flexibility within the O&M program and has given the USACE liberal reprogramming authority, within certain limitations. District and division reprogramming is generally permitted, within certain dollar limits, when it involves work in the President's budget and approved Congressional adds; work from a previous year which has slipped; an emergency has occurred; or acceleration of work in the next year's budget. Reprogramming not consistent with the above must be forwarded to USACE Headquarters for approval.

3. **Decision Making Process.** The determination to dredge a Federal navigation project and how to manage the dredged material has three interrelated components:

- Technical (Is the proposed dredging and management technically sound?)
- Regulatory (Will the proposed action meet applicable laws and regulations?)
- Economic (Does the Federal interest in the project justify the cost of the action?)

For many years, the USACE planned dredging and disposal projects focused primarily at the first two components. Economic justification of maintenance activities at individual navigation projects or specific dredging actions was rarely detailed, since the navigation projects had been authorized by Congress. This approach has changed dramatically in the past 10 years as a result of a decreasing budget for maintaining navigation projects and the inception of the Harbor Maintenance Trust Fund, which reimburses all Federal maintenance dredging and disposal expenditures from a value-based tax on commercial cargoes. During this time, economics became an equal to the other components in dredged material decision making.

In 1988, the USACE published a final rule (33 CFR 209, 335-338) which established the regulation on the disposal of dredged material from Federal navigation projects. Among other things, this regulation required that the USACE district determine the "Federal Standard" for dredged material disposal at specific projects, and that the expenditure of Federal funds for navigation dredging and disposal be based on this determination. The "Federal Standard" is defined in this regulation as the least costly disposal alternative which is engineeringly sound and satisfies applicable environmental regulations. This regulation standardized the USACE decision making process for dredged material disposal and formalized the three components mentioned above into the "Federal Standard".

The Federal Standard is a benchmark for determining the level of Federal funding that will be allocated for the disposal of maintenance dredgings from an authorized Federal channel. It is not a permit decision, and does not impact a dredge and fill permit determination under Section 404 of the Clean Water Act. The "Federal Standard" is determined by the District Engineer for individual dredged disposal projects, and the disposal alternative determined to be the "Federal

Standard” may not necessarily be the preferred alternative of other Federal agencies. The objective is to provide a “level playing field” for the expenditure of Federal funds. Should another, more costly disposal alternative be preferred by the project sponsor or other agency, the “Federal Standard” will be used to determine the share of project costs contributed by the USACE O&M funds. In hindsight, the term “Federal Standard” is easily misunderstood and has contributed to the controversy associated with decisions over the allocation of limited resources.

In 1993, the USACE initiated a program for the development of long-term plans for managing navigation projects. Districts were directed to develop a Dredged Material Management Plan (DMMP) for all deep-draft navigation projects. The DMMP identifies the dredging needs for the next 20 years and the method(s) for management of dredged material. The DMMP defines the “Base Plan” for managing dredged material using the same criteria as the Federal Standard. The DMMP also includes an economic analysis of the Federal interest in maintaining the navigation project.

The “Base Plan” and “Federal Standard” are virtually synonymous, differing only in the scale of application. An individual dredging activity will have a disposal method determined as the “Federal Standard.” A navigation project that requires dredging from several areas over a 20-year time frame will have a “Base Plan” that may include more than one disposal method, each of which meets the “Federal Standard” criteria. For example, the “Base Plan” for a Federal harbor might include beach nourishment with clean, sandy dredged material from the outer harbor, upland beneficial use with fine-grained material with low levels of contamination dredged from the river channel, and confined disposal for the more contaminated materials dredged in other areas of the channel.

The DMMP is conducted in two stages, as shown in the flow diagram on figure 1. A Preliminary Assessment (PA) is conducted at a limited scope. If the PA shows a lack of Federal interest in maintaining the project, dredging of the project is deferred indefinitely. If the PA shows that there is sufficient Federal interest and that dredged material management option(s) consistent with the Federal Standard are already available for the next 20 years, then a detailed DMMP is not required. If the PA shows that dredged material management option(s) consistent with the Federal Standard are not available for

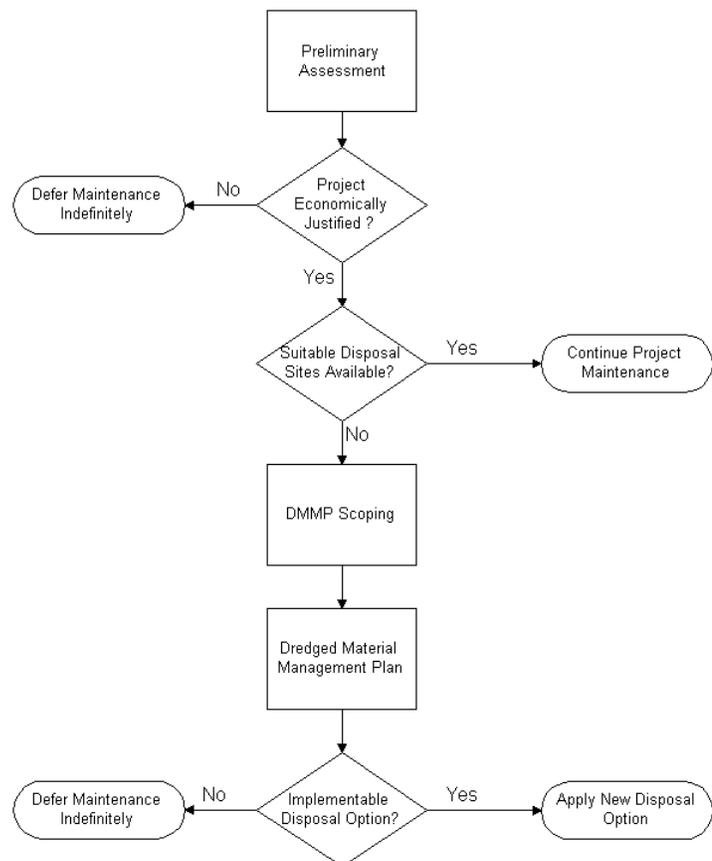


Figure 1. DMMP Process

the next 20 years, a detailed DMMP is prepared which evaluates management options, addresses environmental compliance and defines Federal and non-Federal cost sharing responsibilities.

The Corps of Engineers' procedures for evaluating management options for dredged material and defining the "Federal Standard" will be detailed using the three components introduced at the beginning of this section: technical, regulatory and economic. Following this, the roles and responsibilities of agencies and stakeholders in the DMMP process will be discussed, with specific attention to the most critical and controversial steps in the decision making process.

4. **Technical Component.** The options for managing dredged material might be divided into the following categories:

- open water placement
- beach/littoral nourishment
- capping (level bottom or CAD)
- beneficial use (upland)
- confined disposal
- treatment

The Corps of Engineers has developed technical guidance in the form of Engineer Manuals for districts to use in evaluating the feasibility of dredged material management options and in design and construction management. In addition, the USACE has developed a number of computer models specifically for the analysis of dredged material management options.

Open water placement involves the discharge of dredged material directly to the lake. Hydraulically dredged material may be discharged by pipeline a short distance offshore. Mechanically dredged material may be placed in bottom-dump barges or scows and towed to disposal sites several miles away. Discharged dredged material settles through the water column and deposits on the bottom at the disposal site. The dredged material may remain in a mound at the site or disperse depending on the material's physical properties and the hydrodynamics of the disposal site. Open water placement is used with approximately 32% of Great Lakes dredged material (1993-1996). Most open water disposal sites in the Great Lakes are dispersive in nature. USACE guidance on the selection of open water disposal sites is available (USACE 1976) and computer models have been developed to simulate the development of mounds and movement of dredged material at open water disposal sites (Scheffner et al. 1995).

Beach/littoral nourishment involves the placement of dredged material directly onto a beach or into the shallow water. Beach nourishment is typically discharged by pipeline from a hydraulic dredge. Suitable dredged material is typically a fine sand, and may only stay on the beach for a limited time before being eroded into the littoral drift. Littoral nourishment involves a discharge to near shore, shallow areas, and is typically done with bottom dump scows when a mechanical dredge is used. Beach and littoral nourishment are used with approximately 12% of Great Lakes dredged material (1993-1996). USACE technical guidance on beach nourishment is available (USACE 1987a).

Capping is the placement of a contaminated dredged material in a subaqueous disposal site and covering the material with a layer of clean material. Level bottom capping is the placement of dredged material onto a level bottom surface, as shown on figure 2. Confined aquatic disposal (CAD) involves the use of a depression or excavated subaqueous pit for disposal to provide lateral containment, as shown on figure 2. Cap materials are typically a clean, sandy dredged material. Capping has been used extensively for management of dredged material in the ocean in New York and New England, but has not been used in the Great Lakes. USACE technical guidance on dredged material capping and computer models of cap placement are in development (Palermo et al., in prep)

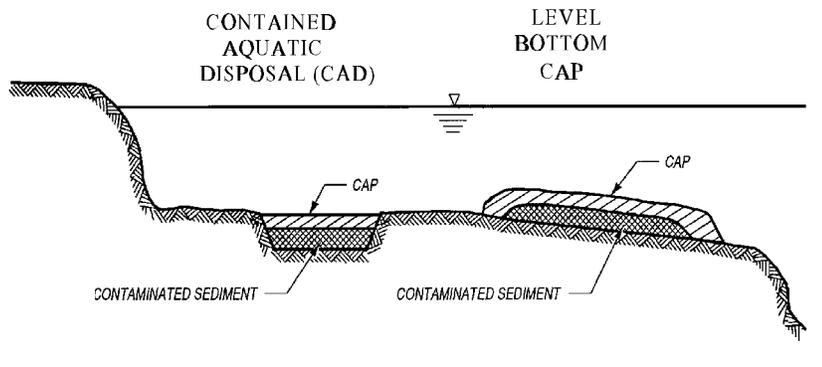


Figure 2. Level bottom capping and contained aquatic disposal (CAD)

Beneficial use of dredged material includes beach and littoral nourishment (as discussed above) and a variety of upland applications, described here. Upland beneficial uses for dredged material include construction fill, landscaping, agricultural applications and wetland/habitat enhancement. Dredged material from Great Lakes harbors has been used for these and other beneficial uses. For upland uses, dredged material is typically placed into a storage area or CDF for dewatering, and then transported by truck for use. The development of islands for wildlife habitat with dredged material is typically done by direct placement from a pipeline. The USACE has continuing authorities to provide federal funding (cost-shared) for the additional cost associated with beneficial use of dredged material for the protection, preservation and enhancement of wetlands and aquatic habitat. Port authorities in Duluth, Green Bay, Milwaukee and Toledo are actively pursuing the development of local markets or applications for dredged material. USACE technical guidance on beneficial use is available (USACE 1987a).

Confined disposal is the placement of a dredged material into a secure area where the sediment is physically contained. Confined disposal facilities (CDFs) are diked structures that have been built for the disposal of contaminated dredged material. Summary information on the 44 CDFs constructed by the USACE to serve Great Lakes navigation projects is provided in table 1. The size, shape, design and level of complexity of these facilities has varied widely depending on dredging quantities, methods of disposal, sediment contamination levels, state and local requirements and site characteristics. Contaminated dredged material can also be placed in commercial landfills, although this has been done more frequently with environmental cleanup dredging than with navigation dredging. USACE technical guidance on confined disposal is available (USACE 1987b) and several computer models have been developed to support CDF design and operation (Schroeder and Palermo 1990; Stark 1991; Myers and Brannon 1991).

Treatment technologies are available to destroy, extract, or immobilize sediment contaminants. These technologies are in varying stages of development, with relatively few available “off-the-shelf” at a full-scale. Treatment technologies have been used at a limited number of sediment remediation projects around the Great Lakes. Most developed technologies require sediments to be dredged, placed into a holding/storage area, and dewatered prior to treatment. No single technology can address the entire suite of contaminants present in many sediments. A number of treatment technologies were evaluated by the USACE as part of a Great Lakes study conducted 30 years ago (Buffalo District 1969). The USEPA Great Lakes National Program Office conducted a comprehensive analysis of sediment treatment technologies under the Assessment and Remediation of Contaminated Sediments (ARCS) Program. ARCS guidance on sediment treatment technologies is available (Averett et al. 1990; Allen 1994; USEPA 1994).

Technical Evaluation Process: Technical considerations can be an important part of a dredged material management decision. The suitability of a dredged material for beach nourishment and the feasibility of capping are at least partially a technical decision, based on physical properties of materials, site hydrodynamics and other considerations. The suitability of dredged material for some beneficial uses may be a technical issue based on the engineering properties of the material and the material needs of the intended use. The siting and design of a CDF requires a series of technical decisions related to the geotechnical or hydrodynamic environment of the site, selection of construction materials, etc. Despite the importance of these considerations, technical and engineering feasibility is rarely the “make or break” component of a dredged material management decision. Regulatory and economic components are more typically the critical path of dredged material decision making.

5. **Regulatory Component.** The environmental laws and regulations that apply to dredged material management can vary depending on the method and location of disposal and the physical and chemical nature of the dredged material. A summary of the major federal regulations that are potentially applicable is presented on table 2, and discussed below:

Clean Water Act, Section 404: Section 404 of the Clean Water Act of 1972 (PL 92-500), as amended, is the primary federal statute regulating the discharge of dredged or fill material into waters of the United States. Section 404 applies to the disposal of dredged or fill material into lakes, rivers and wetlands. It also applies to any “return water” from the upland disposal of dredged material, such as the effluent from a CDF. Section 404 does not apply to the placement of dredged material at upland sites, unless that site is a fill created in waters of the U.S.

Section 404 designates the USACE as the lead federal agency in the regulation of dredge and fill discharges, using guidelines developed by the USEPA in conjunction with the USACE. Federal regulations on the USACE permit program are contained in 33 CFR Parts 320-330 (Regulatory Programs of the Corps of Engineers). Section 404 permits are issued through USACE district offices. Some nationwide and regional permits have been issued to cover specific types of discharges. Section 404(g) of the Clean Water Act allows the USEPA to transfer a portion of the regulatory program for Section 404 to a qualifying state or Indian Tribe. Only one Great Lakes state (Michigan) has been transferred 404 permitting responsibilities. Permit applicants must

Table 2. Potentially Applicable Federal Environmental Laws and Regulations

Statute	Federal Regulation	Lead Agency	Potentially Applicable Activities
Clean Water Act			
Section 307	40 CFR 403	USEPA ¹	Discharge of CDF effluent to municipal sewer.
Section 401	40 CFR 121	State	Dredged and fill discharges to waters of the U.S.
Section 402	40 CFR 122	USEPA ¹	Discharges of CDF effluent. Stormwater discharges from CDF construction.
Section 404	33 CFR 320-330	USACE ^{1,3}	Dredged and fill discharges to waters of the U.S.
Rivers & Harbors Act of 1899			
Section 10	33 CFR 403	USACE	Construction in waterway and dredging.
Coastal Zone Management Act	15 CFR 923	State	Dredging, disposal in water, construction in the coastal zone.
National Environmental Policy Act	40 CFR 1500-1508	USEPA ²	Any significant federal action, including federal permit issuance.
Fish & Wildlife Coordination Act	16 CFR 661-667e	USFWS	Federal agency projects as well as Federal permits or licenses.
Endangered Species Act	16 CFR 1531-1544	USFWS	Government and private activities that could impact Federal threatened or endangered species.
Resource Conservation & Recovery Act	40 CFR 257-258	USEPA ¹	Storage, treatment, and disposal of any hazardous materials.
Toxic Substances Control Act	40 CFR 761	USEPA	Transport, handling and disposal of PCB-contaminated sediments.
CERCLA Section 107	43 CFR 11	NOAA, DOI, States	Resolution of natural resource injury liability associated with hazardous substances released as part of the cleanup process or through an assessment of natural resource damages.

¹ Program responsibility may be delegated to state.

² Document preparation the responsibility of proponent or permitting agency.

³ USEPA has the lead in development of Guidelines and implementation guidance, and retains veto authority

provide sufficient information to complete a 404(b)(1) evaluation, which is prepared by the permitting office.

Section 404 of the Clean Water Act (CWA) is a holistic regulation. The final determination of acceptability of any proposed discharge of dredged material considers the probable impact, including cumulative impacts of the proposed discharge, on the public interest. The CWA directs that 404(b)(1) Guidelines be promulgated by the Administrator of the USEPA in conjunction with the USACE. The development of these Guidelines and implementation guidance are USEPA's primary role in dredged material decision making. The first Guidelines were issued in 1975. The amendments to the CWA in 1977 and experience gained between 1975 and 1980 led to a revision of these Guidelines. This revision, at 40 CFR 230, became a final rule on December 24, 1980.

The 404(b)(1) Guidelines require consideration of potential impacts on the following:

- physical & chemical characteristics of aquatic ecosystem;
- biological characteristics of the aquatic ecosystem;
- special aquatic sites, and;
- human use characteristics.

As indicated above, the 404(b)(1) evaluation process considers potential impacts of a proposed dredged material discharge from many perspectives. Potential physical impacts of disposal considered might include the covering of spawning areas and benthic communities, potential alterations to current or water circulation patterns, or clogging of water supply intakes. These considerations in the 404(b)(1) evaluation should address most of the questions raised for determining Coastal Zone Management (CZM) consistency (discussed below). The 404(b)(1) evaluation also considers the potential impacts of contaminants in the dredged material on water quality and aquatic life. These considerations should answer the questions required for determining state water quality compliance for Section 401 certification (discussed below).

Because of the importance of the 404(b)(1) evaluation to dredged material decision making, a more detailed discussion of this evaluation is provided in Appendix A.

Clean Water Act, Section 401: Section 401 of the Clean Water Act provides the state authority to issue certification that proposed dredge and fill disposal activities will not violate applicable state water quality standards. Part 230.10 (a)(5)(b) of the Guidelines states that no discharge of dredged or fill material shall be permitted if it "causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable state quality standards". A Section 401 certification (or waiver) is required for any discharge regulated under Section 404. The 401 certification is not a permit, per se, but its denial has the same effect as a negative permit determination.

Procedures and requirements for 401 certification have considerable variation from state to state. A summary of the Section 401 requirements of the Great Lakes states is provided on table 3.

Table 3. Summary of State Section 401 Requirements

	401/404 Code and Date	Consideration of Management Options		Data Collection			
		Restrictions	Preferences	Written 401 guidance	Testing Reqts ¹	Approved Methods ¹	Decision Making on Testing ²
Illinois	35 IAC C(II) 395; 1981	Open water placement restricted to sand/larger grained material	Beneficial use encouraged	Y	P,E	P,E	Tiered, based on dredging method
Indiana	none	All options considered	Beneficial use encouraged	Developing	P,C,E,T	P,C,E,T	BPJ
Michigan	MAC R 92; 1973	All options considered	Beneficial use encouraged	Y	P,C,E,T,B	P,C,E,T, B	BPJ
Minnesota	Mn Rules Chapt 7001 & 7050	All options considered	Beneficial use required	Developing	project specific	P,C,E,T, B	BPJ
New York	none	All options considered		Y			BPJ
Ohio	OAC 3745-32, 19??	All options considered		Y	P,C,E,T	P,C,E,T	BPJ
Pennsylvania	none	All options considered		Limited			BPJ
Wisconsin	WAC NR 299, 1990	Open water placement prohibited	Beneficial use encouraged	Y	P,C,E,T,B	P,C,E,T, B	BPJ
Federal ³	40 CFR 230; 1978	All options considered	Beneficial use encouraged	Y	P,C,E,T,B	P,C,E,T, B	Tiered

¹ P = physical; C=bulk chemistry; E=elutriate; T=toxicity; B=bioaccumulation

² BPJ = best professional judgement

³ Federal requirements are under Section 404; regional guidance in “Great Lakes Dredged Material Testing & Evaluation Manual”

Table 3. Summary of State Section 401 Requirements (cont)

	Interpretation of Data				Regulatory Determination		Recommendations
	Approach	Mixing Zone Guidance	Mixing Zone Practice	Problem Parameters	Permit Issuance C=central R=regions B=both	Time Target (days)	
Illinois		N	Rarely considered	TSS, NH3	C		Advance coordination is essential
Indiana		N	Not usually allowed	NH3, metals, PCBs, pesticides	C	60	
Michigan		N			C	60	
Minnesota	Non-degradation	N	Limited	TSS, PO4, NH3, toxics	C	180	Advance coordination of sampling plans
New York		N		Dioxins/furans, PCBs, Pb, Cd, NH3, SO4	B	45/90	
Ohio	Consistency with WQ standards and Phosphorous Reduction Strategy	N	Not considered		C	60	Early coordination
Pennsylvania	Dredged material regulated as construction demolition waste.	N			R		
Wisconsin		Y	Not considered	PCBs, PAHs, metals	R		Earlier consultation on sampling & testing. Recognition of state open water disposal prohibition.
Federal	Contaminant determination made by comparing potential bioeffects of dredged material to material at disposal site.	Y	Modeled, using elutriate or toxicity test results		R	60	

All states have water quality standards developed in accordance with provisions of the Clean Water Act, reviewed and approved by the USEPA. However, only five of the eight states have codified 401 requirements and these requirements are not subject to the same review process as are water quality standards. In one case (Wisconsin), state 401 requirements include a general prohibition against open water disposal of dredged material. Other states have administrative policies (not-codified) encouraging beneficial use of dredged material. Some states issue Section 401 water quality certifications for a disposal site that are valid until the site is no longer usable. Other states issue 401 certifications for a specific time period or number of dredging cycles.

The USACE Final Rule for Operation and Maintenance of Army Corps of Engineers Civil Works Projects Involving the Discharge of Dredged Material into Waters of the U.S. or Ocean Waters (33 CFR Parts 209, 335, 336, 337, and 338) provides time frames for 401 certification (one year). The USACE will assume the state has waived 401 certification if the state agency does not respond in a timely manner. The USACE will not issue a 404 permit to a permit applicant or proceed with a USACE maintenance dredging project if a 401 certification is denied, even if the 404(b)(1) evaluation indicates that the proposed discharge would not have unacceptable, adverse impacts. In most states, USACE is able to conduct testing and evaluation procedures in a manner that satisfies the requirements of 404(b)(1) and Section 401. Disagreements between states and USACE over 401 certification have generally arisen where states have prohibitions against open water disposal, not allowed consideration for mixing, or where state standards include non-numerical criteria that are subjective or broadly defined.

The issuance or denial of a Section 401 Water Quality Certification is often the most critical element of a USACE dredged material disposal project, especially where the preferred management option is open water disposal or involves the construction of an in-water CDF. The role of Section 401 certification in a DMMP is discussed further in section 7. Appendix A describes the methods by which the 404(b)(1) evaluation addresses water quality compliance and mixing zones.

The Great Lakes states have revised their water quality standards in accordance with the Great Lakes Initiative (GLI). The GLI was developed by the USEPA, Great Lakes states, tribes, environmental groups, industries, and municipalities in response to the Great Lakes Water Quality Agreement, Great Lakes Toxics Substances Control Agreement, and Great Lakes Critical Programs Act of 1990. The GLI establishes minimum basin-wide water quality criteria to protect human health, aquatic health, and wildlife; a standard procedure for protecting existing levels of water quality (antidegradation procedures), and; implementation procedures for translating the criteria into enforceable limits on pollutant discharges (see additional discussion in Appendix A). Great Lakes-specific water quality standards adopted by states in conjunction with GLI procedures will be applied to dredged material discharges to the Great Lakes through the Section 401 certification process.

Clean Water Act, Section 402: Section 402 of the Clean Water Act established the National Pollution Discharge Elimination System (NPDES) permit program for point source discharges. NPDES permitting responsibility has been delegated by the USEPA to all Great Lakes states. Section 402 permits have been requested for specific dredged disposal operations

by some states. The USEPA Region 5 Water Division has distributed a policy statement defining circumstances where a CDF effluent would require an NPDES permit. USACE policy is that dredged material discharges are not a point source discharge, that Section 402 does not apply to dredged material discharges, and that the application of Section 402 would be redundant of Section 401 certification. Section 402 may be applicable to the stormwater discharge from an upland CDF site under construction, and perhaps some upland beneficial uses.

Clean Water Act, Section 307: Section 307 of the Clean Water Act directed the USEPA to develop pretreatment standards for industries. The National Pretreatment Program was established to assure that major industrial and commercial users of municipal sewer systems pretreated their discharges so that the publicly owned treatment works (POTWs) remained in compliance. Technology based standards were developed by the USEPA (40 CFR 403) to be implemented at municipal POTWs. The responsibility for the administration of the pretreatment program has been delegated by the USEPA to four of the Great Lakes states. Local municipalities and sanitary districts are responsible for the management of pretreatment programs for their wastewater systems, and must issue pretreatment permits to significant users. Section 307 could be applicable in a situation where the effluent from a CDF was routed to a POTW.

Rivers & Harbors Act: Any structures or work that impact the course, capacity, or condition of a navigable water of the United States must be permitted under Section 10 of the Rivers & Harbors Act of 1899 (33 CFR 403). The permit program for Section 10 permits is managed by the USACE. Activities subject to these regulations include dredging activities, construction of in-water CDFs, and open water disposal. Permits for Section 10 and Section 404 of the Clean Water Act are typically handled jointly by USACE district offices. The USACE coordinates Section 10 permits with the Coast Guard, which issues a notice to navigation.

Coastal Zone Management Act: The Coastal Zone Management Act of 1972, as amended (16 USC, 1451 et seq.) requires that federal actions reasonably likely to affect any land or water use or natural resources of the coastal zone, regardless of location, be consistent with approved state coastal management programs. Federal actions that require a Coastal Zone Management (CZM) consistency determination include: federal agency activities and development projects (including, for example, harbor and navigation dredging, dredged material disposal/management, beach nourishment, and construction of in-water or upland CDFs); private applicant activities that require federal licenses, permits or approval, and; state and local government activities conducted with federal assistance. The Act and subsequent amendments affirm a national commitment to the effective protection and rational development of coastal areas.

State CZM consistency review and enforcement is often managed by a different agency than that responsible for a state's Section 401 Water Quality Certification. Five of the Great Lakes states administer federally approved coastal management programs, including Michigan, New York, Ohio, Pennsylvania, and Wisconsin. Two of the remaining three states, Indiana and Minnesota, are each in the active process of developing a state coastal management program.

National Environmental Policy Act: Section 309 of the 1970 amendments to the Clean Air Act (PL 91-604) and the National Environmental Policy Act (NEPA) of 1969 (PL 91-190)

require a detailed statement on significant federal actions impacting the quality of the human environment. One of two types of NEPA documents must be prepared for any major federal action; an environmental assessment (EA) or environmental impact statement (EIS). The more detailed EIS is required where there are significant impacts on a significant resource.

The USEPA administers the NEPA program, but the agency that has the lead in the federal action is responsible for preparing and coordinating the NEPA document. The NEPA document is filed with the USEPA, who publishes a notice of availability in the Federal Register. A dredging project conducted by a federal agency or with federal funds would require NEPA compliance. In addition, the issuance of a permit under a federal regulatory program requires NEPA compliance. The permittee is required to provide the information and data required for a NEPA document to the permitting agency, who then prepare the EA or EIS.

NEPA is not a permit program, and can not force or deny any particular dredged material management decision. However, by requiring that the environmental effects of all reasonable management options are considered and documented, NEPA helps assure that the dredged material decision making process is open and comprehensive.

Fish & Wildlife Coordination Act: The Fish and Wildlife Coordination Act of 1934, as amended, requires consultation with the U.S. Fish and Wildlife Service (USFWS) and the fish and wildlife agencies of states where the “waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified” by any agency under a federal permit or license. Procedurally, the USACE typically requests a letter from the USFWS for maintenance dredging projects when a new disposal site is proposed, or when a significant change in operations is considered. The Fish & Wildlife Coordination letter identifies fish and wildlife resources which might be impacted by the proposed dredging and disposal operations, and identifies any threatened or endangered species within the general area of the proposed dredging and disposal operations. This letter is typically included in NEPA documents, as an attachment.

Endangered Species Act: The Endangered Species Act of 1973 provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend, both through federal action and by encouraging the establishment of state programs. The Act authorizes the following actions as well as others: (1) the determination and listing of species as endangered and threatened; (2) prohibits unauthorized taking, possession, sale, and transport of endangered species; (3) provides authority to acquire land for the conservation of listed species, using land and water conservation funds; (4) authorizes establishment of cooperative agreements and grants-in-aid to states that establish and maintain active and adequate programs for endangered and threatened wildlife and plants; (5) and directs the Secretary of Interior to develop and review recovery plans for listed species without showing preference for any taxonomic group and establishes recovery plan criteria for listed species.

In other areas of the country, compliance with the Endangered Species Act is a significant problem for maintenance dredging activities. A large dredge can kill a slow moving aquatic animal, like the sea turtle or manatee. Dredging does not appear to be a threat to endangered

species in the Great Lakes, since most are deterred from active navigation channels. However, confined disposal facilities have become nesting grounds for a number of birds and migratory waterfowl and the disposal operations at these facilities may have to be scheduled to avoid the destruction of active nests.

Toxic Substances Control Act: The Toxic Substances Control Act of 1976 (PL 94-469), as amended, regulates the manufacture, use, distribution, handling and disposal of a very limited number of materials defined as toxic substances, one of which is polychlorinated biphenyls (PCBs). TSCA is managed by the USEPA, and this authority can not be delegated. Specific activities which are regulated under TSCA include the handling, transport, treatment and disposal of dredged material that contains 50 ppm PCBs, or greater, and the disposal or management of dredged material that contains less than 50 ppm PCBs.

Amendments to the PCB regulations promulgated under TSCA were published in the Federal Register on June 29, 1998 (FR 35384-35474). Under these amendments, dredged material, or sediments, containing PCBs is considered "PCB remediation waste" and can be managed based on the concentration at which the PCBs are found. Cleanup of the sediments is generally based on the existing PCB concentration, risk, and/or the date the PCBs were originally released into the environment. Disposal of PCB remediation is covered under 40 CFR 761.61. There, TSCA provides several disposal alternatives. PCB-contaminated sediments from marine or freshwater ecosystems must be disposed of by TSCA-approved incinerator or land filling or by other risk-based alternatives specifically approved by the USEPA Regional Administrator. For sites which are not part of a marine or freshwater ecosystem, PCB-contaminated sediments may be disposed in a RCRA-approved hazardous waste landfill provided certain notification and certification requirements are met. Some states have additional regulations for PCB-contaminated materials independent of TSCA.

The TSCA amendments also include provisions to dispose or manage dredged material containing less than 50 ppm PCBs. Specifically, such low level contaminated material is to be disposed or managed in accordance with a permit that has been issued under Section 404 of the Clean Water Act or under Section 103 of the Marine Protection, Research and Sanctuaries Act, or the equivalent of either of these permits as provided for in the USACE regulations at 33 CFR 320. The beneficial use of dredged material containing less than 50 ppm PCBs would be governed by these regulations, guidance and permits.

Resource Conservation & Recovery Act: The Resource Conservation and Recovery Act (PL 94-580) broadly defines solid waste as "any garbage, refuse, sludge from a waste treatment plant, water supply plant or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Section 402 of the Federal Water Pollution Control Act, or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended."

Subtitle D of the Resource Conservation and Recovery Act (RCRA) authorizes states to issue solid waste disposal permits. As illustrated above, the federal definition of solid waste is very general, and few states have regulations which specifically identify sediments or dredged material as a category or class of solid waste. The USACE policy is that dredged materials are not a solid waste, and not subject to solid waste regulations. Some federal and state agencies do not concur with this policy. As a result, there is a considerable amount of confusion about the application of solid waste regulations to contaminated sediments. The application of state solid waste regulations to upland disposal (confined or beneficial use) is discussed further in section 7.

RCRA also regulates the storage, treatment and disposal of hazardous wastes (40 CFR 260-270). The USEPA is responsible for the administration of RCRA, and has established three lists of hazardous wastes under Subtitle C. If a waste is not listed as hazardous, it may still be covered by RCRA if it exhibits one of four hazardous waste characteristics: ignitability, corrosivity, reactivity, or toxicity. Contaminated sediments, except for sediments and sludges from specific industrial processes, are not listed hazardous wastes. The USEPA policy is that sediments which contain one or more listed hazardous wastes require handling as a hazardous waste. The USACE policy that dredged materials are not a solid waste and not subject to RCRA precludes dredged material from being a hazardous waste. As a result of this policy disagreement, there is some confusion about the application of RCRA to contaminated sediments. State solid and hazardous waste regulations are sometimes more explicit in regard to their applicability to dredged material.

CERCLA/SARA: The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA) established programs for environmental remediation and restoration. These are not regulatory programs. However, the presence of sediment contaminated with hazardous substances may give rise to cleanup and restoration liability under CERCLA/SARA, and this liability may have substantial bearing on proposed dredging and disposal activities.

Contaminated sediments may be addressed under CERCLA/SARA under two pathways. The first is where the waterway containing the contaminated sediments is scored under the Hazard Ranking System and proposed for listing on the National Priorities List. The Hazardous Ranking System is based on risk to human health and ecological impacts, and if the site is listed, the options for remediation of contaminated sediments are evaluated during a Remedial Investigation/Feasibility Study (RI/FS). The remediation of a Superfund project may be undertaken by the USEPA, state, or potentially responsible party (PRP). The decision making process for Superfund is unique and fairly self-contained. Most regulatory permit requirements are waived for Superfund projects, although the intent of these regulations should be satisfied.

When a part of a federal navigation project is listed as a Superfund site, the USACE typically defers maintenance activities in that portion of the project until after a Record of Decision has been signed and remedial actions completed. This is done to avoid compromising the position of the Federal Government in negotiations with PRPs, and to allow for remediation of contaminated sediments to be paid for by PRPs. In certain cases, Superfund investigations or negotiations may impact Great Lakes navigation if channels remain unmaintained while the contaminant issues are addressed.

The second pathway for CERCLA/SARA involvement with contaminated sediments is through the statute's natural resources damage liability provisions. Section 107 of CERCLA/SARA designates federal, state, and tribal trustees for natural resources and authorizes them to address releases of hazardous substances that injure or threaten to injure natural resources and services such resources provide to the public. The goal of the natural resource trustees is to protect natural resources by abating injury from hazardous substances and restoring injured resources and the services they provide for the public welfare. Natural resources are broadly defined in CERCLA/SARA as lands, fish, wildlife, biota, surface and ground waters and other resources held in the public trust.

Natural resources damage liability is addressed by the trustees to determine the extent of injury caused to natural resources and services they provide in order to determine the amount of restoration required. Liability can be resolved through the cleanup process in coordination with agencies responsible for the RI/FS or through the Natural Resource Damage Assessment (NRDA) process set forth in 43 CFR 11. While the resolution of natural resource liability is related to the RI/FS process and its concern for human health and environment, it is distinct in its focus on a broader range of impacts caused by hazardous substances. For example, contaminated sediments may injure natural resources (i.e., fisheries, navigable waterways, etc.), but they may also interfere with services provided by these natural resources (i.e., fishing, waterborne navigation). The National Oceanic and Atmospheric Administration (NOAA) is the primary natural resource trustee for waterborne commerce, and has the lead in resolving this category of natural resource liability in order to compensate for limitations or losses of this service caused by hazardous substances.

To date, experience with natural resource damage liability at Great Lakes sites with contaminated sediments is relatively limited and the coordination of dredged material management decision making with NOAA and other natural resource trustees is conducted through agency review and comment on NEPA documents, DMMPs and Section 404 permit applications. In order to restore the use of navigation channels and other associated natural resources, it will be necessary to more fully integrate natural resources damage liability considerations into the dredged material decision making process.

Regulatory compliance process: Regulatory compliance of a USACE dredging and disposal project can be accomplished in several ways. The vast majority of Great Lakes harbors have dredged material disposal sites (open water, beneficial use or CDFs) for which compliance was previously completed and no additional actions are necessary until the site is filled or conditions change. For most of these, regulatory compliance was completed in association with the preparation of the EA or EIS. The Section 404(b)(1) evaluation, CZM consistency determination and other necessary compliance items were typically included with NEPA documentation. In the future, the DMMP, with accompanying NEPA document will be the mechanism through which regulatory compliance actions are initiated.

6. **Economic Component.** The USACE navigation mission and authority to perform dredging and dredged material management at federal harbors and channels in the Great Lakes originates from enabling legislation summarized on table 4. Many of the Great Lakes harbors were authorized by Congress through River & Harbor Acts in the 19th century. Most of the harbors that were authorized prior to the Flood Control Act of 1936 included little or no economic justification (i.e., benefit:cost evaluation) and had little or no specific requirements for local sponsors. The economic justification requirements for new Civil Works projects have increased progressively since this Act.

Currently, the standard procedure for a proposed new commercial navigation project is to collect and analyze detailed commodity and vessel data to estimate transportation cost savings (benefits), which are then compared to project costs to determine if the project is economically justified. Detailed comparisons are made between benefits and costs with a project versus without the project. Both benefits and costs are annualized over a 50-year economic life and compared, with a goal that average annual benefits be at least equal to or greater than average annual costs for the project to be economically justified. Eligible benefits or savings with a new project are commonly referred to as National Economic Development (NED) benefits which are contributions to the nation's economy that increase the value of the national output of goods and services. An example is transportation benefits (that is, savings in transportation costs when comparing waterborne transportation against alternative competitive modes of transportation such as rail, or time and cost savings due to the elimination of a constraint in the existing navigation system which may be causing delays). Average annual costs include project construction costs and operation and maintenance costs. The economic analysis for such new projects is a very rigorous process.

The economic analysis process for DMMPs is somewhat different than that for a new navigation project, since the harbor is an existing federal project for which no changes are proposed. As such, in lieu of standard analysis procedure, a two-phase economic analysis process is followed. During the first phase of the DMMP study, a Preliminary Assessment (PA) is conducted. As part of the PA, a preliminary level of analysis comparing trends in the project's benefits and costs is conducted. Readily available data on vessel traffic and operations are used as benefit indicators which are compared to historical and current maintenance dredging costs. USACE and congressional documents for a harbor are investigated. The most recent study containing a National Economic Development (NED) benefit-to-cost analysis is used as a basis for comparing historic project benefits and project costs to current ones. If the trend in NED benefits exceed costs, continued maintenance dredging is considered to be economically justified. However, if the trend data show that costs exceed benefits, economic justification is considered to be uncertain at this level of analysis. Then, in the second phase, a standard, more detailed analysis is performed to determine if continued maintenance dredging is economically justified.

Just as the requirements for economic justification of new Civil Works project have steadily increased, it might be reasonable to expect the same for DMMPs and the operation and maintenance of existing navigation projects. Current DMMP guidance requires that economic justification for project maintenance be conducted incrementally with benefit analysis for separable reaches or segments of navigation projects. At navigation projects where the bulk of commerce

Table 4. Enabling Legislation Related to Dredged Material Management

Authority	Description	Non-Federal Cost Share ₁	Status
Rivers & Harbors Acts (various)	Authorized the USACE to operate and maintain specific federal navigation projects	Various	Active
Section 107, River, Harbor and Flood Control Act of 1960, as amended	Established a continuing authority for the USACE to construct small navigation projects	Based on channel depth (commercial); LERR plus 50% (recreational)	Active
Section 123, River & Harbor Act of 1970	Authorized the USACE to construct confined disposal facilities for disposal of contaminated sediments from Great Lakes harbors and channels	LERR, plus 25% construction cost, subject to waiver	Not active ₂
Section 204, WRDA 1986, as amended	Established cost sharing requirement for operation and maintenance of new navigation projects		Active
Section 204, WRDA 1992, as amended	Authorized the USACE to protect, restore or create aquatic habitat, including wetlands through the beneficial use of dredged material from federal navigation projects	25% of incremental cost increase over base plan	Active
Section 312, WRDA 1990, as amended	Authorized the USACE to dredge contaminated sediments outside authorized navigation channels for environmental remediation	50% of dredging costs, plus all disposal costs	Active
Section 201, WRDA 1996	Established uniform cost sharing policy for future dredged material disposal areas	Based on channel depth LERR, plus 35% for most Great Lakes harbors	Active
Section 217, WRDA 1996	Established policy for partnerships between the USACE and non-Federal interests for the development and use of dredged material disposal facilities	Same as Section 201, WRDA 1996	Active
	₁ LERR = lands, easement, rights-of-way, and relocations		
	₂ Authority closed for future CDFs, except for Green Bay		

utilizes only the outer harbor, benefits may not be sufficient to justify maintaining even limited depths in the river channel. Continued maintenance dredging at projects or project segments which have no commercial traffic contributing to the Harbor Maintenance Trust Fund is less than certain in light of Administration policies regarding recreational benefits and the litigation challenging the constitutionality of the Trust Fund.

In 1997, the USACE released a study on options for producing cost savings in the O&M budget (USACE 1997a). This study was prompted by the fiscal realities of recent years which have maintained a near-flat O&M budget, with increases not keeping pace with inflation. Among the cost saving measures identified in the report for consideration are reduced dredging at some projects, maintaining channels at narrower widths or shallower depths, and ceasing maintenance of some projects. While this study did not make recommendations about the discontinuance of operation or maintenance activities at specific Great Lakes navigation projects, it serves as an indicator that expenditures for dredging and other O&M activities will continue to be scrutinized carefully in the future.

7. **Decision Making Responsibilities.** The process by which decisions are made regarding dredging and dredged material management at federal navigation projects may involve numerous agencies at federal, state and local levels. It may also involve a number of funding authorities and environmental laws and regulations. The generalized process by which the USACE prepares a Dredged Material Management Plan (DMMP) was shown on figure 1. A detailed graphical representation of this process, linking the pertinent laws and regulations is provided in figure 3. The roles and responsibilities of the USACE, local sponsor, other federal agencies, state resource agencies and local stakeholders in the DMMP process are shown on table 5. USACE guidance on DMMPs is provided in Engineering Regulation ER 1105-2-100 (USACE 1997b).

For navigation projects requiring no dredging or where existing, approved disposal sites and methods are sufficient for the next 20 years, the DMMP process is simply a documentation of the status of federal interest in maintaining the project. This is executed in the Preliminary Assessment, which is prepared by the USACE district with input from local navigation users and harbor managers. The Preliminary Assessment is generally not controversial, except where the determination is that there is no federal interest in maintaining all or part of the project. The economic justification for continued maintenance of a navigation project is currently based on a trend analysis. So long as navigation use of the project or tangible indications of commerce (tonnages) or recreational benefits have continued to grow at a rate comparable to the increase in dredging and disposal costs, continued maintenance is assumed to be justifiable.

DMMP DECISION MAKING PROCESS

11/1/98

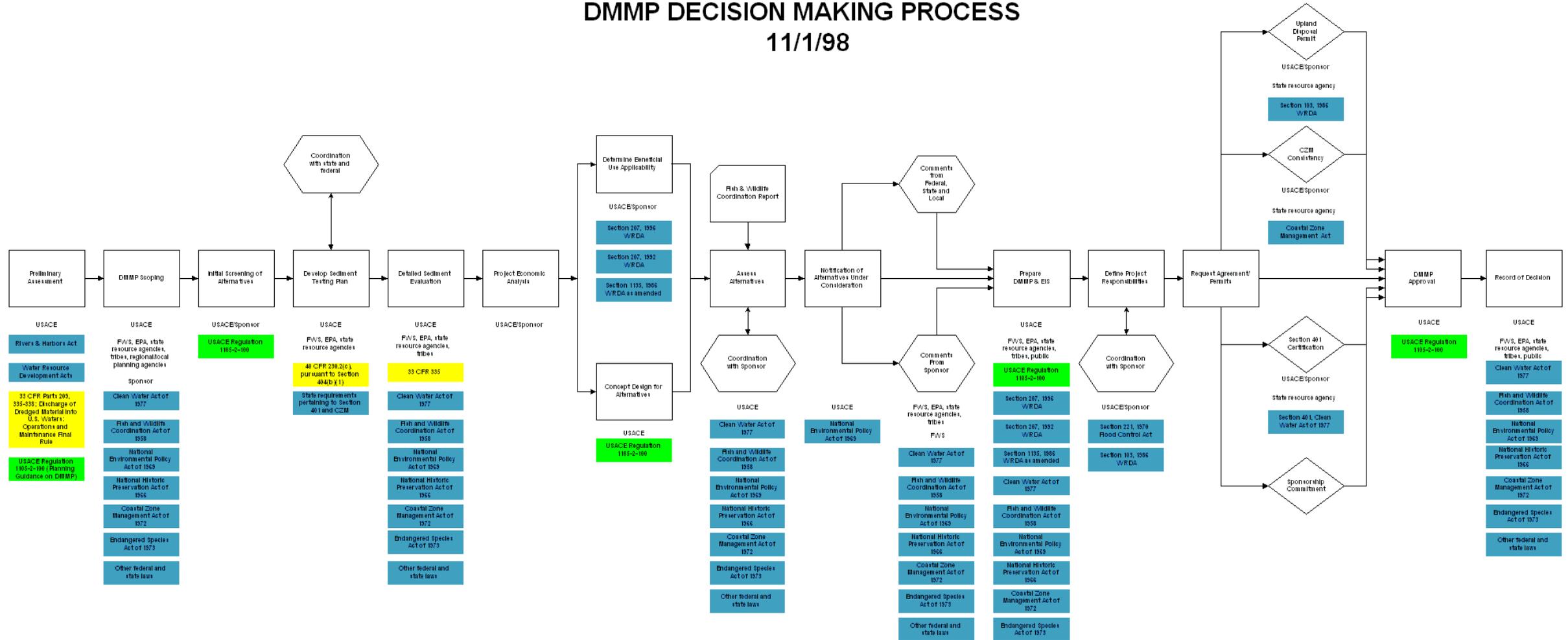


Table 5. Dredged Material Management Roles & Responsibilities

Activity	Principal Players	Role	Responsibility	Principal Authorities
Preliminary Assessment	USACE	<ul style="list-style-type: none"> - Preparer - Coordinator - Decision maker (District Engineer) 	<ul style="list-style-type: none"> - Maintain authorized federal project - Ensure 20-year future disposal capacity for dredged material 	<ul style="list-style-type: none"> - River & Harbor Acts - Water Resource Development Acts - 33 CFR Parts 209, 335-338, Discharge of Dredged Material into U.S. Waters: Operations and Maintenance Final Rule - USACE Regulation 1105-2-100 (Planning Guidance on DMMP)
DMMP Scoping	USACE FWS, EPA, state resource agencies, tribes, regional/local planning agencies Sponsor	<ul style="list-style-type: none"> - Facilitator - Inputer/commenters - Inputer 	<ul style="list-style-type: none"> - Ensure process open to all - Assure interests are considered per federal/state law and guidance Identify potential disposal alternatives and beneficial uses	<ul style="list-style-type: none"> - Clean Water Act of 1977 - Fish & Wildlife Coordination Act of 1958 - National Environmental Policy Act of 1969 - National Historic Preservation Act of 1966 - Coastal Zone Management Act of 1972 - Endangered Species Act of 1973 - other federal and state laws
DMMP Initial Alternative Screening	USACE/Sponsor	- Evaluators	- Screen out unreasonable alternatives (economic, environmental or engineering standpoint)	- USACE Regulation 1105-2-100
DMMP Detailed Assessment Sediment testing plan	USACE FWS, EPA, state resource agencies	<ul style="list-style-type: none"> - Developer/ implementor - Inputer/commenters 	<ul style="list-style-type: none"> - Follow EPA/USACE testing guidance - Identify & coordinate federal and state requirements 	<ul style="list-style-type: none"> - 40CFR 230.2(c), pursuant to Section 404(b)(1) - State requirements pertaining to Section 401 and CZM

Table 5. Dredged Material Management Roles & Responsibilities

Activity	Principal Players	Role	Responsibility	Principal Authorities
DMMP Detailed Assessment Sediment evaluation	USACE FWS, EPA, state resource agencies, tribes	- Evaluator - Inputer/commenters	- Identify federal standard - Identify and coordinate federal and state requirements	- 33 CFR 335 - Same as “Scoping” above
DMMP Detailed Assessment Economic evaluation of existing project	USACE/Sponsor	- Evaluator	- Determine viability of all project segments	
DMMP Detailed Assessment Determine beneficial use applicability	USACE/Sponsor	- Developer/coordinator	- Economical environmental enhancement	Section 207, 1996 WRDA Section 204, 1992 WRDA Section 1135, 1986 WRDA, as amended
DMMP Detailed Assessment Concept design for each alternative	USACE	- Developer	- Further refine impact and costs - Insure beneficial uses are considered	- USACE Regulation 1105-2-100
DMMP Detailed Assessment Assess/evaluate alternatives	USACE	- Evaluator	- Conduct impact comparison, screen out unreasonable alternatives	- Same as “Scoping” above
DMMP Detailed Assessment Notification of alternatives under consideration	USACE	- Coordinator	- Ensure compliance with federal Law	- National Environmental Policy Act of 1969
DMMP Detailed Assessment Request comments	FWS, EPA, state resource agencies, tribes FWS	- Commenters - Preparer	- Provide feedback on federal/state requirements - Prepare FWCA Report	- Same as “Scoping” above - Fish & Wildlife Coordination Act of 1958

Table 5. Dredged Material Management Roles & Responsibilities

Activity	Principal Players	Role	Responsibility	Principal Authorities
DMMP Selection of Alternatives Prepare/coordinate DMMP/EIS	USACE FWS, EPA, state resource agencies, tribes, public	- Preparer/coordinator - Commenter/reviewer	- Identify Base Plan and selected alternative - Ensure compliance with USACE regulation - Evaluation of feedback results in final determination of economic, engineering and environmental acceptability - Provide detailed feedback on federal/state requirements	- USACE Regulation 1105-2-100 - Section 207, 1996 WRDA - Section 204, 1992 WRDA - Section 1135, 1986 WRDA, as amended - Same as "Scoping" above
DMMP Selection of Alternatives Define project responsibilities	USACE/Sponsor	- Preparer/coordinator	- Develop cost sharing/Project Cooperative Agreement	- Section 221, 1970 Flood Control Act - Section 103, 1986 WRDA
DMMP Selection of Alternatives Request 401 Certification	USACE State resource agency	- Requester - Issuer	- Ensure compliance with federal law	- Section 401, Clean Water Act of 1977
DMMP Selection of Alternatives Request CZM Determination	USACE State resource agency	- Requester - Issuer	- Ensure compliance with federal law	- Coastal Zone Management Act
DMMP Selection of Alternatives Request upland permit (if req'd)	Sponsor State resource agency	- Requester - Issuer	- Ensure compliance with state permit requirements	- State environmental regulations (various)
DMMP Approval	USACE	- Decision maker	- Ensure compliance with USACE regulation	- USACE Regulation 1105-2-100

Table 5. Dredged Material Management Roles & Responsibilities

Activity	Principal Players	Role	Responsibility	Principal Authorities
Record of Decision	USACE FWS, EPA, state resource agencies, tribes, public	- Decision maker - Commenter/reviewer	- Ensure compliance with federal law - Ensure compliance with federal and state laws/regulations	- National Environmental Policy Act of 1969 - Same as “Scoping” above

At projects where existing disposal sites or methods will not be sufficient to accommodate the dredging needs for the next 20 years, a detailed DMMP must be prepared. The process for developing the DMMP involves a number of agencies and interests at different stages. The roles of these participants may be categorized as follows:

Sponsor	A non-Federal governmental body that can enter into agreements with the USACE to provide funding, lands, easements, rights-of-way, relocations, and may be required to operate and maintain certain project features.
Issuer	A federal, state or local agency that is responsible for the management of one or more regulatory programs, and may issue a permit, certification, determination or evaluation.
Inputer/commenter	Any agency, group or individual who reviews proposals, offers suggestions, makes comments or raises issues for consideration.

In some cases, a single entity may have multiple roles in the DMMP process. For instance, a state may be a sponsor for a disposal site, the issuer of CZM consistency determination and 401 water quality certification, and an inputer/commenter on the DMMP and NEPA documents.

The roles of key federal agencies in the DMMP and decision making process are summarized on table 6. Other federal agencies (not listed) that have an interest may participate in the scoping and review of the DMMP as well as review NEPA documents.

The decision making process illustrated in Appendix B and table 5 includes a number of steps that are routine and non-controversial. The rest of this section will focus on those steps that are considered critical and sometimes confrontational.

DMMP Scoping: The initial step in the development of a DMMP is often critical to success, for it is during this stage that participants are identified and some of the roles defined. The presence of a local or state governmental organization which may serve as a project sponsor is a key. Although commitments are not made at this stage, the absence of a prospective sponsor may result in the DMMP being deferred indefinitely. During the scoping stage, nongovernmental organizations (NGOs) with a potential interest in the projects should be identified and a dialogue initiated. This is not often as easy as it sounds. Many NGOs show little interest in projects until alternatives and sites have narrowed to a few, or one. Ideally, project scoping is conducted with prospective sponsor(s) identified and willing to assume some of the responsibilities of coordination with local NGOs from the start.

Sediment Evaluation: The development and implementation of a sediment testing plan is a critical step because the data derived from this evaluation is directly linked to the determination of environmental regulatory compliance. In the past, some USACE districts have developed sediment sampling and testing plans without consultation with other federal and state agencies. This has frequently resulted in disputes over the adequacy of the data and necessitated resampling and testing in some cases. The “Great Lakes Dredged Material Testing and Evaluation Manual”

encourages, in the strongest language possible, that districts develop sampling and testing plans in cooperation with federal and state resource agencies.

Table 6. DMMP Roles of Federal Agencies

Federal Agency	Decision Making Role(s)
Corps of Engineers	overall project coordination/implementation
Environmental Protection Agency	develop 404(b)(1) Guidelines develop 404(b)(1) implementation guidance review sampling/testing plans issue TSCA permit (if applicable) oversee Superfund actions (if applicable) oversee NEPA compliance
Fish & Wildlife Service	review sampling/testing plans prepare F&WS Coordination Act letter oversee Endangered Species Act compliance
National Oceanic & Atmospheric Administration	develop CZM guidance review sampling/testing plans lead Trustee for waterborne commerce
Coast Guard	prepare notice to navigation
All agencies	participate in project scoping review DMMP review NEPA documents

An invitation to review and comment on a proposed dredged material sampling and testing plan should enable districts to assure that data collected will meet the needs of state 401 certification, CZM consistency determination, or other regulatory requirements as well as the 404(b)(1) evaluation. Unfortunately, a few agencies take the opportunity to request data not relevant to the proposed dredged material management. On balance, though, there is far more to be gained from thorough coordination of sampling and testing plans than not.

Coordination of sediment sampling and testing plans is especially important where the regulatory guidance is lacking, such as for upland beneficial use. Although the USACE and USEPA have adopted some testing procedures for evaluating the potential environmental impacts of dredged material in beneficial uses (USACE/USEPA 1992) these procedures do not have the force of law as with the 404(b)(1) evaluation procedures. Most states do not have guidance or regulations explicitly dealing with beneficial use of dredged material. Consequently, testing protocols and interpretive guidelines may need to be developed on a case-by-case basis.

Section 401 Certification: Perhaps the most critical step in a DMMP recommending open water disposal or construction of an in-water CDF is the Section 401 Certification. This is entirely a state action, although the authority originates in the federal Clean Water Act. As illustrated on table 3, the Section 401 policies of the Great Lakes states range considerably. Section 401 directs that states certify that a proposed dredged material discharge will not violate state water quality standards, after allowing for mixing. This certification may come into conflict with the “Federal Standard” where states apply general policies restricting open water disposal of dredged material or where mixing zones are not allowed. Wisconsin is the only Great Lakes state with a codified policy prohibiting open water disposal of dredged material, except where used for beneficial purposes. Minnesota has a similar policy, although not codified and other states have policies encouraging beneficial use but still certify open water disposal.

In determining the “Federal Standard,” the USACE evaluates the impacts of a proposed dredged material discharge on water quality conditions. Section 404(b)(1) implementation guidance developed by the USEPA and USACE includes detailed procedures for evaluating the concentrations of contaminants at dredged disposal sites, and computer models for determining compliance with numerical water quality standards after consideration for mixing (USEPA/USACE 1998a). In some cases, state standards are not numerical concentrations. Where these non-numerical standards are related to potential impacts of contaminants on water quality or aquatic resources, the 404(b)(1) evaluation process should be able to address their concerns. For example, most numerical water quality standards were derived from toxicological studies of contaminants. The Great Lakes Dredged Material Testing & Evaluation Manual (USEPA/USACE 1998b) employs whole sediment and elutriate bioassays and bioaccumulation methods to determine if dredged materials contaminants would have significant adverse impacts. If these procedures do not address state concerns about specific contaminants, project-specific testing and evaluation procedures may be developed in tier 4 of the 404(b)(1) process.

The 404(b)(1) evaluation process is flexible enough to deal with almost any concern about impacts from dredged material disposal that are scientifically based. USACE policy on Section 401 certification is to seek an agreeable solution with states that is scientifically defensible. State policies that preclude open water disposal without consideration would negate the entire 404(b)(1) evaluation process and 404 regulatory framework. States with such policies have not attempted to demonstrate that open water disposal categorically causes unacceptable adverse impacts, but have justified these policies based on perceived public or political sentiment against open water disposal. Where a state determines that it will deny consideration of any open water dredged disposal activity for political or public perception reasons, the USACE policy is to follow the 404(b)(1) evaluation process and determine the “Federal Standard” irrespective of state policy or prohibition against open water disposal. In such cases, a conflict between federal and state interests is inevitable.

There are three paths to resolve these types of disagreements between the USACE and state. The first would be an adjudicated solution. Without speculating on the possible strengths or weaknesses of either side, it can objectively be stated that this approach is not likely to produce an amicable solution or enhance future relations between the USACE and state, and should be considered the option of last resort.

A second path for the resolution of this disagreement is legislative. Federal legislation to amend the Clean Water Act (Section 404) or directing the USACE to redefine the “Federal Standard” are feasible, although attempts to amend the Clean Water Act have not been successful in recent years and any general change to the USACE dredged material management policy which allows for more costly disposal methods at the total discretion of states is likely to be opposed by navigation users who contribute to the Harbor Maintenance Trust Fund.

In 1994, Illinois State Code was amended to enable bank disposal of material dredged from the Illinois Waterway. Prior to this rule change, Section 401 Water Quality Certification had been denied by the state when preliminary testing indicated the potential violation of water quality standards without allowance for mixing zones. The new rule defines an acceptable “area of dilution” where state standards can be violated. Outside of this area all standards must be met. As was the case in Illinois, amendment of state code is only feasible where the state agency responsible for Section 401 certification is agreeable to the change and with some level of support from ports or navigation industry groups.

The third (and preferred) method for resolving disputes over the “Federal Standard” determination is to seek an alternate disposal method that is acceptable to the state and cost comparable to open water disposal. The most commonly used alternatives to open water disposal for uncontaminated dredged material are beach/littoral nourishment, upland beneficial use and unconfined upland disposal. If the dredged material is predominantly sand, the material may be used for beach or littoral nourishment, often at no greater cost than open water disposal. However, the costs of upland disposal are commonly higher than open water disposal. Where the Federal Standard is open water disposal, the costs for this method of disposal serve as the baseline for federal funding from the navigation project. Any additional costs required for other disposal methods have to be borne by non-federal interests. However, where applicable, the Beneficial Use of Dredged Material program, authorized under Section 204 of the Water Resources Development Act of 1992 may be used to cost-share (75% federal/25% non-Federal) the incremental costs for beneficial use above the open water disposal baseline.

Role of USEPA: Where there has been a conflict between the USACE determination of the Federal Standard and a state’s position on Section 401 certification, there has been some confusion about USEPA’s ability to resolve the dispute. As mentioned above, USEPA’s primary role in dredged material decision making is through the development of the 404(b)(1) Guidelines and national and regional implementation guidance for 404(b)(1) evaluations. In this capacity, EPA can review dredged material testing and evaluation to determine if it follows the Guidelines and the Great Lakes Dredged Material Testing & Evaluation Manual. USEPA also oversees NEPA compliance, and in this capacity will review EA or EIS documents to determine if they meet the spirit and intent of NEPA.

Through Section 404(c), the USEPA maintains “veto power” over a Section 404 permit issued by the USACE. However, EPA position is that since the USACE does not issue itself a permit for disposal of maintenance dredgings, this veto authority is not applicable to disputes over the Federal Standard. Further, USEPA has stated that although it may support a state’s 401 determination in such a dispute, it would be totally outside it’s authority and mandate to direct the

Corps to modify its Federal Standard, as this is fundamentally a decision regarding the expenditure of federal funds. Consequently, it is entirely possible for USEPA to agree with the state's position regarding Section 401 noncompliance and have no opinion regarding the apparently conflicting Corps' Federal Standard determination.

Upland Disposal/Solid Waste Permitting: Federal and state laws and regulations governing management of dredged material in the water (or wetlands) are explicit and relatively straightforward. In contrast, federal laws relative to all types of upland disposal are virtually non-existent. Consequently, state regulation of upland disposal is unpredictable. In some cases, states have elected to "pigeon-hole" dredged material into one or more solid waste categories. This categorization often creates problems, as solid waste regulations were not designed for the management of large volumes of fine-grained soil particles with accompanying volumes of water.

At least one Great Lakes state (New York) has proposed solid waste regulations specifically for dredged material which identify acceptable beneficial uses based on contaminant levels. Most other states have no solid waste or other regulations specifically for upland management of dredged material. The application of RCRA testing and solid waste regulations has been utilized by some states. This approach, which is not supported by USACE, can serve as a basis for determining if a dredged material requires handling as a hazardous waste (a very rare occurrence), but fails to answer questions about the acceptability of the material for beneficial use or unrestricted upland disposal.

The lack of clear regulatory guidance for upland disposal has limited the beneficial use of dredged material. USEPA/USACE dredged material management guidance provides a general framework for evaluating upland disposal and beneficial use (USEPA/USACE 1992), and laboratory tests have been developed to evaluate contaminant uptake by plants and animals. However, these guidance have no federal regulatory foundation, and the testing procedures have no comprehensive interpretation guidance. Decision making procedures for upland disposal and beneficial use generally have to be developed on a project-by-project basis.

8. Summary. This paper has described the process used to make decisions regarding the management of dredged material at federal navigation projects in the Great Lakes basin. This process has seen significant changes in the past ten years resulting from new Corps regulations, the development of Dredged Material Management Plans (DMMPs), new dredged material testing and evaluation procedures, and overall reductions to the Corps' Operation and Maintenance (O&M) budget. Economics has become an equal to technical and regulatory components in dredged material management decision making.

The DMMP process has increased awareness of the roles and responsibilities of federal, state and local agencies in dredged material management. Recent legislation and the decline of the O&M budget have greatly increased the responsibilities of non-federal sponsors as cost-sharing partners and advocates for beneficial use of dredged material. The benefits of active and effective partnering on dredged material management include greater public and agency acceptance of management plans, enhanced beneficial use, and more reliable harbor and channel maintenance.

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Appendix A Section 404(b)(1) Evaluation

Overview: The preamble to Section 404 states that discharges of dredged or fill material to waters of the U.S. should be avoided where alternate means of disposal are practicable. Section 404(b)(1) of the Clean Water Act directs that Guidelines for the evaluation of proposed discharges be promulgated by the Administrator of the USEPA in conjunction with the USACE. The 404(b)(1) Guidelines issued in 1975, and revised in 1980, require consideration of potential impacts on the following:

- physical & chemical characteristics of aquatic ecosystem;
- biological characteristics of the aquatic ecosystem;
- special aquatic sites, and;
- human use characteristics.

Potential physical impacts of disposal considered might include the covering of spawning areas and benthic communities, potential alterations to current or water circulation patterns, or clogging of water supply intakes. The 404(b)(1) evaluation also considers the potential impacts of contaminants in the dredged material on water quality and aquatic life.

Implementation guidance: A key component in determining compliance with the 404(b)(1) Guidelines is the evaluation and testing procedure for the material proposed for discharge pursuant to 40 CFR 230.60 and 230.61. Guidance on the implementation of the 404(b)(1) Guidelines may be developed by the USEPA and USACE at national and regional levels. These implementation guidance must be consistent with the Guidelines. (Note that the Guidelines require formal rulemaking, and have the effect of law, while implementation guidance does not require rulemaking unless it changes the Guidelines). The first guidance manual on 404(b)(1) implementation, entitled "Ecological evaluation of proposed discharge of dredged or fill material into navigable waters" was published by the USACE in 1976. In 1990, the USEPA and USACE began efforts to update a portion of the 1976 national guidance manual.

The "Inland Testing Manual" (USEPA/USACE 1998a) provides national guidance on dredged material testing and evaluation procedures. These procedures provide only a portion of the information necessary for a complete 404(b)(1) evaluation, and are directed at the "contaminant determination" portion (40 CFR 230.11(d)), although the information obtained through these testing procedures is relevant to other parts of the 404(b)(1) evaluation.

Because the "Inland Testing Manual" varied from the Guidelines, the USEPA published proposed rulemaking in the Federal Register on January 4, 1995. The substance of this rulemaking was to include a definition of reference sediment comparable to that already used in ocean disposal regulations. The existing Guidelines base a contaminant determination on a comparison of the dredged material to sediment at the proposed disposal site. In contrast, the Marine Protection, Research, and Sanctuaries Act (MPRSA) uses a comparison of the dredged material to sediment at reference site for decision on ocean disposal of dredged material.

The USEPA and USACE offices responsible for the Great Lakes have developed regional testing and evaluation guidance in parallel with the "Inland Testing Manual" development. The draft "Great Lakes Dredged Material Testing & Evaluation Manual" was distributed for public review in December 1994. This manual, now finalized, is available through USEPA's Internet home page at: www.epa.gov/glnpo/sediment/gltem/

Contaminant determination: The "Inland Testing Manual" and "Great Lakes Dredged Material Testing & Evaluation Manual" apply a tiered approach to testing in order to develop sufficient information for a contaminant determination. The tiered testing approach is consistent with the procedures used for ocean disposal of dredged material under Section 103 of the MPRSA (USEPA/USACE, 1991), and is also generally consistent with the "Guidelines for project evaluation" developed by the International Joint Commission (IJC 1982).

The objective of the tiered testing approach is to make optimal use of resources in generating the information necessary to make a contaminant determination, using an integrated chemical, physical, and biological approach. To achieve this objective, procedures are arranged in a series of tiers with increasing levels of intensity. The initial tier uses available information that may be sufficient for completing the evaluation in some cases. Evaluation at successive tiers requires information from tests of increasing sophistication and cost.

The basic flow diagram for the tiered testing procedure is shown on figure A-1. The most logical and cost efficient approach is to enter Tier 1 and proceed as far as necessary to make a determination. There are two possible conclusions that can be made at each of the first three tiers: 1) available information **is not** sufficient to make a contaminant determination, or 2) available information **is** sufficient to make a contaminant determination. Where information is sufficient, one of the following determinations may be reached: a) the proposed discharge **will not** have unsuitable, adverse, contaminant-related impacts, or b) the proposed discharge **will** have unsuitable, adverse, contaminant-related impacts.

Tier 1 compiles existing information about the potential for contamination in the proposed dredged material. Disposal operations that are excluded from testing or have historic data sufficient for the contaminant determination may proceed to a determination without additional testing.

Tier 2 evaluates the potential impacts of the proposed discharge on water column and benthic environments using sediment physical and chemical data collected for this tier, and applied with computer models to project worst-case conditions for water quality impacts and bioaccumulation. Based on the results of Tier 2 evaluations, additional testing may be reduced or eliminated.

Tier 3 evaluates the potential impacts of the proposed discharge on water column and benthic environments using effects-based biological testing. The "Great Lakes Dredged Material Testing & Evaluation Manual" presents recommended procedures for biological-effects tests with six organisms, as summarized in table A-1, specifically for use in the Great Lakes Basin.

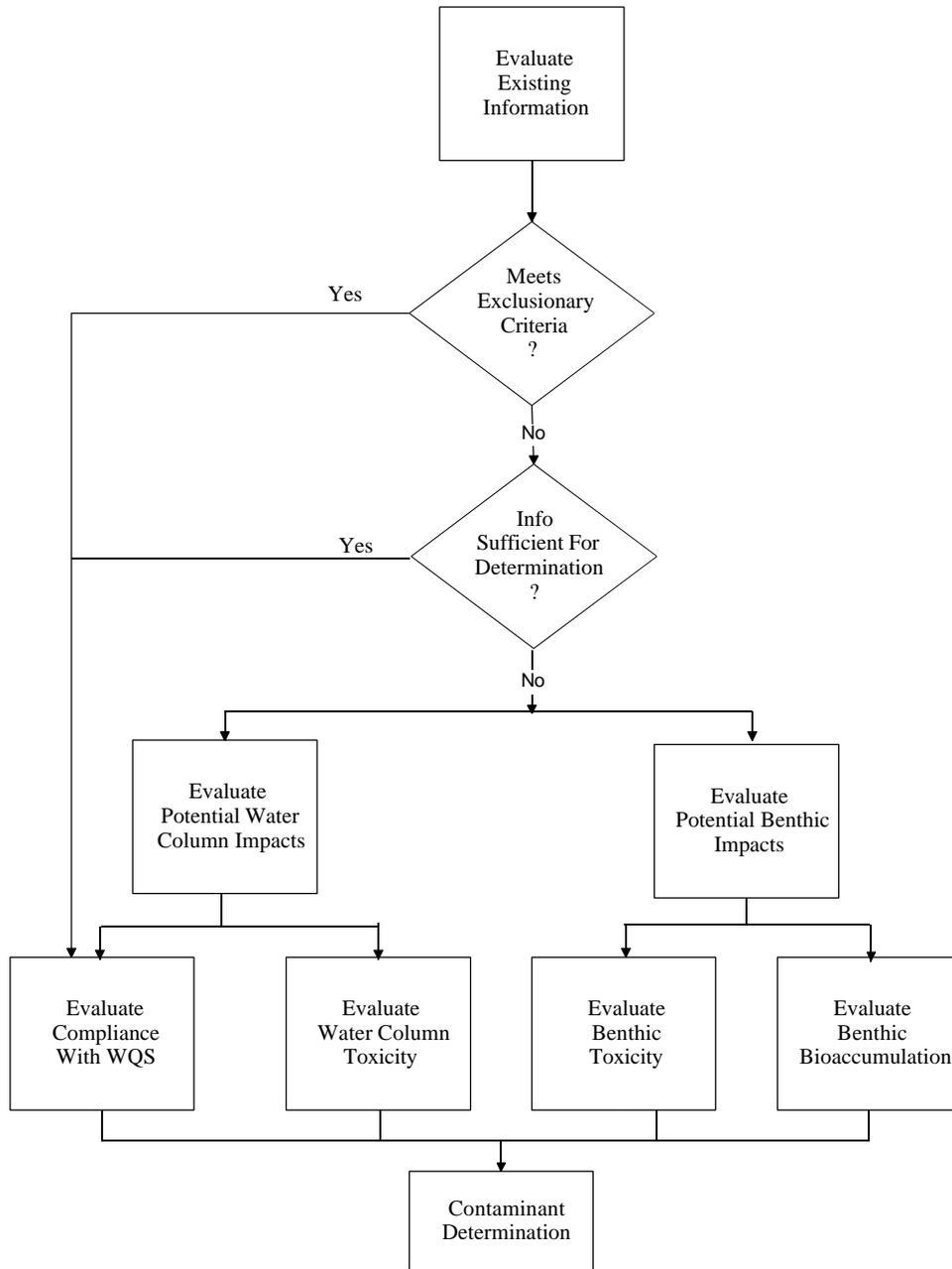


Figure A-1. Tiered Testing Flow Diagram

Tier 4 is only entered if the information provided by Tiers 1 through 3 is not sufficient to make a contaminant determination. The procedures used in Tier 4 are keyed to site specific issues not resolved by the standardized procedures of earlier tiers. It is intended that very few situations will require a Tier 4 evaluation.

Table A-1. Effects-based biological tests

Species	Test Type ¹	Endpoint(s)	Test Duration (days) ²
<i>Daphnia magna</i>	E	Survival/Survival and reproduction	2/21
<i>Ceriodaphnia dubia</i>	E	Survival/Survival and Reproduction	2/7
<i>Pimephales promelas</i>	E	Survival/Survival and Growth	4/7
<i>Chironomus tentans</i>	S	Survival and Growth	10
<i>Hyalella azteca</i>	S	Survival and Growth	10
<i>Lumbriculus variegatus</i>	S	Bioaccumulation	28

¹ Elutriate (E) or solid phase (S)

² Only short-term tests recommended for Tier 3 application.

With this tiered testing structure, it is not necessary to obtain data for all tiers to make a contaminant determination. It may also not be necessary to conduct every test described within a given tier to have sufficient information for a determination. The underlying philosophy is that only that data necessary for a determination should be acquired.

The sediment toxicity and bioaccumulation tests required for Tier 3 and 4 evaluation are more costly than physical and chemical tests. Since budgets for dredging and related testing and evaluation have not been increasing, there is a need to make decisions based on more extensive analyses of fewer samples. This trend has heightened the importance of advance coordination with federal and state resource agencies on dredged material sampling and testing.

Water Quality and Mixing Zones: The 404(b)(1) Guidelines require that the potential impacts of a dredged material discharge on water quality be evaluated with consideration for mixing. Part 230.11(f) of the Guidelines states that, "The mixing zone shall be confined to the smallest practicable zone within each specified disposal site that is consistent with the type of dispersion determined to be appropriate by the application of these Guidelines." The Guidelines lists the following factors to be considered in determining the acceptability of a proposed mixing zone:

- depth of water;
- current velocity, direction, and variability;
- degree of turbulence;
- stratification attributable to causes such as obstructions, salinity or density profiles;
- discharge vessel speed and direction, if appropriate;
- rate of discharge;
- ambient concentration of constituents of interest;

- dredged material characteristics, particularly concentrations of constituents, amount of material, type of material (sand, silt, clay, etc.) and settling velocities;
- number of discharge actions per unit of time, and;
- other factors of the disposal site that effects the rates and patterns of mixing.

USEPA/USACE guidance on implementation of Section 404(b)(1) Guidelines utilizes the STFATE (Short Term FATE) model to determine if a dredged material discharge will exceed state water quality standards outside a mixing zone (USEPA/USACE 1994).

Water quality compliance can be determined in Tier 2 or Tier 3. In Tier 2 there are two approaches available. The first approach employs a water quality screening model to assess the conservative, worst-case water quality impacts of the proposed discharge. This model assumes 100 percent release of sediment-bound contamination into the water column, and calculates the concentrations of contaminants at the disposal site, allowing for mixing. The second approach utilizes the results of sediment elutriate analyses together with the mixing zone model. The elutriate test involves the mixing of sediment and site water in a manner which simulates the agitation caused during dredging and disposal. Contaminants released into the water are measured and the results evaluated using the mixing zone model.

If a contaminant determination is not reached in Tier 2, the results of water column toxicity tests performed in Tier 3 are evaluated using the mixing zone model. The water column toxicity tests expose sensitive aquatic organisms to the dredged material elutriate, which may be diluted in series as the test solution. The concentration of elutriate which will cause 50 percent mortality of exposed test organisms (LC_{50}) is determined. If the concentration within the mixing zone exceeds 0.01 of this concentration, then the impacts of the proposed discharge are considered not in compliance with the Guidelines.

Relevance of Great Lakes Initiative: The Great Lakes Initiative (GLI) was developed by the USEPA, Great Lakes states, tribes, environmental groups, industries, and municipalities. The Great Lakes Water Quality Agreement between the U.S. and Canada and Great Lakes Governors' Toxics Substances Control Agreement established the basis for the development of consistent and integrated efforts to protect the Lakes from impacts caused by toxic substances. The GLI was begun in 1989. Subsequently, Great Lakes Critical Programs Act of 1990 mandated development of the GLI. USEPA issued the Final Water Quality Guidance for the Great Lakes System in March, 1995.

The GLI establishes minimum basin-wide water quality criteria to protect human health, aquatic health, and wildlife; a standard procedure for protecting existing levels of water quality (antidegradation procedures), and; implementation procedures for translating the criteria into enforceable limits on pollutant discharges. The states and tribes are required to adopt consistent, Great Lakes-specific water quality criteria for toxic pollutants in their water quality standards. The USACE comments on the draft GLI stated USACE interpretation that GLI was focused on point source discharges and does not apply to non-point source discharges, and specifically not to dredged and fill discharges regulated under Section 404. The USEPA position is that the focus of GLI is not only on point sources. Although several of the general implementation procedures

apply only to point sources, the balance of GLI applies equally to both point and non-point sources.

There is agreement that water quality standards adopted by states in conjunction with GLI procedures will be applied to dredged material discharges to the Great Lakes through the Section 401 certification process.