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Beneficial Uses of Great Lakes Dredged Material:

A Report of the Great Lakes Beneficial Use Task Force

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I. INTRODUCTION

> **Beneficial use** is the placement or use of dredged material for some productive purpose, such as beach/near-shore nourishment, habitat restoration, landscaping, amendments to agricultural soils, road construction fill, strip mine restoration or temporary cover for landfills. Beneficial uses may involve either the dredged material or the placement site as the integral component of beneficial use.
>
> – *Great Lakes Commission Task Force on Beneficial Use of Dredged Material*

The need to find and advance beneficial use alternatives to conventional dredged material management–alternatives to open water disposal and placement in a Confined Disposal Facility (CDF)–has been a topic of increasing importance to state, federal and local stakeholders. This need stems not only from diminishing CDF capacity and decreasing acceptance of indiscriminate open water disposal, but also from an emerging philosophy that, where possible, reuse and recycling of dredged material should take priority over disposal. The beneficial use of dredged material that is not contaminated or only mildly contaminated can allow CDF capacity to be reserved for the most contaminated dredged material. This can extend the life of Great Lakes CDFs where capacity is diminishing. New CDFs are costly to build and can be difficult to site. From an environmental standpoint, technological and regulatory developments to reduce/eliminate contamination or exposure to contamination has made beneficial use imperative. With proper testing and government guidelines that protect human health and the environment, beneficial use of dredged material offers a sustainable long-term management option for dredged material in the Great Lakes basin. However, numerous regulatory, financial and public perception issues continue to be major obstacles to beneficial use.

In January 1999, national stakeholders, including state agencies, the U.S. Army Corps of Engineers (the Corps), the U.S. Environmental Protection Agency, ports and other groups, convened in New Orleans, La., to discuss dredging and coastal management. Many recommendations from that workshop related to the need to overcome institutional, regulatory and financial obstacles to the beneficial use of dredged material. One outcome of the New Orleans meeting was a report that included a series of recommendations for promoting the beneficial use of dredged material.

Around the same time, The Great Lakes Dredging Team (GLDT) was grappling with issues around beneficial use. The GLDT was formed in 1996 as a partnership of federal and state agencies created to assure that the navigational 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. In September 1998, the GLDT sponsored a regional workshop on the beneficial use of dredged material. An outcome of the workshop was the GLDT's establishment of a Working Group on Beneficial Use. Subsequent work by the GLDT Working Group on Beneficial Use identified the need to increase public understanding of and develop national guidance for the beneficial use of dredged materials. Based upon this assessment, the GLDT endorsed a Great Lakes Commission proposal to address these issues. In late 1999, with support from the U.S. EPA-Great Lakes National Program Office (GLNPO) and endorsement of the Great Lakes Dredging Team, the Great Lakes Commission

embarked on a two-year project to advance beneficial use of dredged material in the Great Lakes basin.

The Great Lakes Beneficial Use Task Force was a critical element of the Great Lakes Commission's project. Task force members were appointed by members of the GLDT, which served in an advisory capacity to the task force. Task force members were charged with identifying state/federal concerns and priorities regarding beneficial use. Collectively, the task force served as a vehicle for state-federal cooperation in identification of mechanisms to overcome state and federal regulatory obstacles to beneficial use. The task force also provided oversight and input into the development of an informational booklet on the beneficial use of dredged material as part of the project.

Task force members participated in two meetings during the course of the project. In-person meetings were complemented by individual phone conversations, e-mails and review of written materials. At its first meeting in Chicago in June 2000, the Great Lakes Beneficial Use Task Force identified many obstacles to beneficial use and suggested ways to overcome them. Many of the obstacles and suggestions were similar to those identified at the national workshop in New Orleans. The lack of an effective state/federal regulatory framework for the beneficial use of dredged material was identified as a major obstacle to beneficial use. In response, a series of preliminary recommendations were developed to advance the beneficial use of dredged material. A second meeting of the Great Lakes Beneficial Use Task Force was held in Milwaukee, Wis. in October 2000 (in conjunction with the GLDT) to review and refine the preliminary recommendations.

Section II of this report contains the final findings and recommendations of the Great Lakes Beneficial Use Task Force. In Section III the Great Lakes Dredging Team has identified a strategy that prioritizes several recommendations and proposes actions for their implementation. Section IV of the report contains examples of beneficial use projects throughout the Great Lakes basin organized into six categories: beach/littoral nourishment, habitat restoration, topsoil creation/enhancement, capping, landscaping and construction materials. These examples are listed alphabetically by state under each category. Section V provides an overview of selected innovative technologies for treating contaminated dredged material for beneficial use. Section VI includes profiles of the regulatory framework for beneficial use of dredged material for each of the Great Lakes states. Appendix A is a Great Lakes Commission resolution titled *Making Beneficial Use of Dredged Material*, a policy priority as adopted in May 2001.

The review of the state regulations pertaining to beneficial use (as reflected in Section V of this report) substantiates the lack of any dedicated or coordinated regulatory approach to beneficial use. The findings in Section I further identify and confirm the specific obstacles, gaps and needs, which the recommendations are intended to address. These recommendations are presented for consideration by all dredged material management stakeholders. Their effective adoption and implementation depends on early and ongoing communication, coordination and cooperation among local, state and federal governments; the private sector; and the interested public.

II. FINDINGS AND RECOMMENDATIONS

1. **A more expansive, codified federal definition for dredged material and its beneficial use should be developed. In this definition, dredged material should be considered a distinct material, neither a solid waste nor a discharge. In addition, the definition should be broad enough to allow flexibility to incorporate multiple beneficial use options. The definition should be initiated through a stand-alone piece of legislation. Regional offices of federal agencies (i.e.,GLNPO, the Corps regional headquarters) could jointly develop a definition that could be a regional pilot for federal legislation. States should look to this definition when modifying/creating regulatory programs for beneficial use.**

   Most Great Lakes states consider dredged material a solid waste. Defining dredged material as a solid waste generally means that it must be regulated as such. As a result, public perception of dredged material tends to be negative and the use of dredged material is met with a variety of regulatory hurdles. Regulating dredged material as a "waste" severely limits beneficial use projects because the philosophy behind solid waste management (once the waste is generated) is one of containing wastes to prevent their escape into the environment. Though recycling or reuse has become commonplace in municipal, and to some extent, industrial waste management, the same concept has not yet pervaded the area of dredged material management. As a result, regulating dredged material as a solid waste, even under a series of "exemptions," is not optimal. A federal definition of beneficial use of dredged material would clarify that dredged material is distinct from solid waste, effluent, industrial waste and other materials. Based on this definition, modification of existing or development of new state and federal regulatory programs that promote reuse and/or recycling of dredged material is encouraged. The utility of a codified federal definition may vary among states; however, many states would benefit from the direction provided by a federal definition, which would offer an alternative framework to those states dissatisfied with current regulations that treat dredged material as a solid waste.

   No distinction should be made (explicitly or implicitly) between beneficial use and decontamination. Rather, the beneficial use of dredged material should be defined to include all possible management options other than disposal, whether upland, in-water or riparian. These uses would cover the spectrum from straightforward upland placement (e.g., fill, cover) to decontamination and reuse in any number of industrial or non-industrial applications.

   New York and Minnesota have avoided some of the problems associated with applying solid waste regulations to dredged material by identifying specific applications that define beneficial use of dredged material or by defining and regulating dredged material as a type of excavated material. In New York, dredged material ceases to be a solid waste if it is used in a manner that conforms to state regulations governing beneficial use. This practice is called a "Beneficial Use Determination," or BUD. In practice, this process is used specifically to avoid placing dredged material into the solid waste framework, which would complicate, if not prohibit, beneficial use. In Minnesota, regulating dredged material as an "excavated material" avoids having to manage it as a waste and provides opportunities for beneficial use.

2. **Testing protocols specific to dredged material should be developed and adopted by all Great Lakes states.**

   Because dredged material can vary widely in its physical and chemical properties (i.e., not all dredged material is heavily contaminated or sandy), a process should be established to test the material to identify appropriate beneficial uses. Contaminant testing procedures should be established that are specific to dredged material, a substance with its own unique physical and chemical characteristics. The *Great Lakes Dredged Material Testing and Evaluation Manual* developed by the U.S. EPA and the

Corps was designed as a decisionmaking tool for dredge and fill activities under Section 404 of the Clean Water Act. The manual could be considered a model protocol for testing when beneficial use involves in-water applications. The Corps' Technical Note DOER-C2 (May 1999) titled *Dredged Material Characterization Tests for Beneficial Use Suitability* and Technical Note DOER-C7 (July 1999) titled *Case Studies: Characterization Tests to Determine Dredged Material Suitability for Beneficial Uses* also provide detailed guidance on testing procedures for the beneficial use of dredged material. A regional upland testing manual, perhaps developed by the Great Lakes Dredging Team, with technical support from the Corps and U.S. EPA, that builds on these efforts may be a valuable tool for advancing beneficial use projects in the Great Lakes basin. The Corps has indicated interest in working with Great Lakes states in the development of such a regional testing manual and could provide technical assistance to the states in adoption of protocols.

3. **Risk-based guidance that establishes contamination thresholds or parameters for different beneficial use applications, based on the physical and chemical properties of the dredged material and its end use, should be developed. This guidance should use a comparative, risk-based approach instead of strict numerical standards, yet could allow for case-specific determinations to consider the range of physical and chemical characteristics of dredged material and exposure pathways associated with its end use. Contaminant criteria in Michigan's risk-based approach to determining use of contaminated material (MIDNR Admin. Rules 114 through 118) and in Section 404 of the Clean Water Act are possible models to follow.**

The New York State Department of Environmental Conservation is in the process of developing dredged material management guidance, which may include numerical criteria and, in the interim, has established a case-specific evaluation process instead of numerical contaminant criteria. It has been noted that the establishment of numerical limits for the beneficial use of dredged material could be difficult for any agency to accomplish. For example, Wisconsin is currently struggling with creating numerical criteria for PCBs in soils. Initial analyses to develop numerical PCB soil criteria resulted in maximum loading limits of soil that contains PCBs below current detection levels. The practical ramifications of these criteria in Wisconsin is that beneficial use application of any PCB contaminated dredged material, however slight, would be prohibited.

Michigan's experience offers possible solutions to the problems presented by numerical criteria. Michigan has established risk-based criteria that allow for beneficial use of dredged material depending on the risks associated with different exposure pathways. Though these numerical criteria are established for soils and groundwater, they are applied also to dredged material based on the risks associated with the different sediment types and potential end uses. This risk-based approach results in end uses ultimately being determined by exposure risks rather than strict numerical limits. Though this approach may involve the use of exposure controls, which could stigmatize the dredged material for beneficial use, it also provides an alternative for reusing material that might otherwise go to a landfill or CDF.

A second alternative to instituting strict numerical contaminant criteria is the use of the comparative approach based on Section 404 of the Clean Water Act and outlined in the *Great Lakes Dredged Material Testing and Evaluation Manual.* This manual applies a tiered approach to testing in order to develop sufficient information for contaminant determination, using an integrated chemical, physical and biological approach. Determination 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. However, because the *Great Lakes Dredged Material Testing and Evaluation Manual* was designed for in-water application, it does not allow for consideration of reduced exposure due to different upland end uses.

4. **Federal guidance to evaluate the benefits and impacts of beneficial use projects should be developed. Such guidance will aid federal as well as state agencies with decisionmaking regarding beneficial use proposals and will foster public understanding of the environmental and other benefits of beneficial use. Federal guidance should encourage beneficial use by prioritizing reuse and recycling of dredged material over disposal, and should consider the benefits of using dredged material to avoid resource-depleting activities, such as landfill creation and mining of sand dunes. The guidance, or its application, may be integrated with guidance related to contaminant risks (see #3 above) to provide a mechanism for determining the acceptability and preferability of beneficial use based on an evaluation of economic, environmental, human health and social impacts and benefits.**

Once dredged material has been tested and evaluated in terms of contamination risks, there is a need for guidance to evaluate holistically the economic, environmental and social benefits and impacts of utilizing dredged material beneficially. For example, the benefits and cost-savings associated with not filling existing CDFs should be considered in all beneficial use projects. Although placing dredged material in an existing CDF may be the least expensive alternative for a particular project, heavy and/or indiscriminate use of CDFs could result in their premature closure and would ultimately require the use of more expensive alternatives (i.e., construction of a new CDF) for future projects. (This point was also highlighted by the National Dredging Team at its January 1999 workshop in New Orleans.)

There is a particular need to consider the impacts of beneficial use on public interests. Guidance that establishes parameters for evaluating the benefits and impacts of beneficial use projects will help educate the public (and other stakeholders) of the decisionmaking process behind beneficial use, and its associated benefits and trade-offs. The guidance will make the decisionmaking process more transparent and will establish a process for justification of the appropriateness of beneficial use projects.

Section 404 of the Clean Water Act may be used as a model in the creation of guidance to determine benefits and impacts. A holistic regulation, Section 404 has guidelines that require consideration of potential impacts on the following: 1) physical and chemical characteristics of the aquatic ecosystem; 2) biological characteristics of the aquatic ecosystem; 3) special aquatic sites; and 4) human use characteristics. In writing federal beneficial use guidance, these concepts can be modified to incorporate non-aquatic upland beneficial use options. Considerations might also be added for impacts on the local economy, so that the range of environmental, social and economic factors are considered. Any new guidance should be clear and easy to implement by all stakeholders, including private marinas and lake associations.

5. **The federal standard should be modified to promote beneficial use of dredged material. The new policy should allow for cost-effectiveness over the "least costly" alternative. Such a policy should clarify the flexibility of the federal standard as it is applied to beneficial use. The federal standard should be applied based on an evaluation of the net social, environmental and economic benefits and impacts/costs of different dredged material management options–not strict adherence to the least costly alternative based on present value.**

Currently, the least costly alternative for placement of Great Lakes dredged material is most often open water disposal or, when the material is contaminated or prohibited from open water disposal (i.e., Wisconsin and Minnesota), placement in a confined disposal facility (CDF). However, these management options are not always the most cost-*effective* or the most beneficial over the long term. For example, under the current federal standard, relatively clean material dredged from a navigation

channel might end up in a CDF because the costs associated with dewatering and/or transporting the material to a nearby upland site for construction fill is more costly, even though the fill is needed and dredged material could meet that need at a moderately higher cost. A more holistic application of the federal standard would consider the cost savings associated with not using valuable CDF capacity as well the costs savings (if any) associated with using dredged material instead of other material for the needed use. A revised federal standard would make beneficial use the first alternative considered and ruled out only when, after a holistic examination of costs, the costs remain prohibitively high. In addition, this guidance would reaffirm that dredged material management must be environmentally acceptable and consistent with established engineering requirements.

6. **Existing state regulations governing beach/littoral nourishment should be expanded where possible to support a variety of beneficial use options. State regulations pertaining to beach/littoral nourishment should specify thresholds of sand (as a percentage of dredged material) that qualify for this type of beneficial use.**

   Illinois, New York and Wisconsin have regulatory processes for beach/littoral nourishment projects that are distinct from either upland or in-water projects. In these states, beach/littoral nourishment projects are relatively successful and are generally supported by the public. Modifications to these regulations may be possible to allow for other beneficial uses and, as a result, increase the likelihood of other beneficial use projects.

   Specific policies or regulations that provide thresholds of sand that qualify for beach nourishment will offer the clarity needed to the Corps and other parties that desire to pursue this beneficial use option. Wisconsin regulations provide a formula for evaluating dredged material in comparison to the existing material on the proposed beach nourishment site. Michigan and Ohio have established specific thresholds for sand required for beach nourishment projects. Approximately 30-40 percent of dredged material from navigation channels is used for beach nourishment in Michigan.

7. **Consideration should be given to the development/enhancement of state and federal programs to encourage creative cost-sharing arrangements to cover additional costs associated with beneficial use options that meet a new federal standard. Such programs would make beneficial use projects more cost-effective than utilizing disposal options.**

   In addition to regulatory hurdles, beneficial use projects generally have higher costs than traditional dredged material disposal options. Creative cost-sharing arrangements would include in-kind contributions and nonprofit organization eligibility for state and federal assistance in support of beneficial use projects. Such arrangements would allow and encourage those who benefit from the beneficial uses to become active partners in cost-sharing, in addition to traditional cost-sharing partnerships. There is greater likelihood of local support if there are significant economic, social and/or environmental benefits to be gained. Where beneficial uses are possible, creative-cost sharing partnerships should be aggressively pursued by the Corps, port authorities, state agencies and other stakeholders. An attempt to amend language in WRDA in 2000 to increase the federal portion of Section 204 cost-sharing was not approved by Congress; however, future attempts should be made.

8. **Beneficial use should be identified as a priority when developing, updating and periodically reexamining Dredged Material Management Plans (DMMPs). Federal, state and local agencies involved in the DMMP process should work closely to ensure that beneficial use is considered early and throughout the process so opportunities for beneficial use are maximized. DMMPs should be flexible to allow beneficial uses after a DMMP has been developed, should opportunities arise.**

Traditionally, DMMPs have not adequately considered beneficial use options. Though beach nourishment is included in some plans, the primary management options considered in DMMPs have been open water disposal and the use of existing CDFs. Where CDF capacity is diminishing, efforts have been focused on building new CDFs or expanding existing CDF capacity. The incentive to consider beneficial use has been deterred when CDFs have sufficient capacity or when capacity can be increased by raising dikes. While some of the bias toward open water disposal or CDF placement is a result of the "federal standard" and other obstacles to beneficial use, DMMPs can perpetuate this bias if the focus remains on using traditional disposal options. Recognizing that beneficial use is an inherently more sustainable approach to dredged material management than CDF placement or open water disposal, beneficial use options should be considered early in the DMMP process, particularly where existing CDF capacity is low and/or options are not available to modify an existing CDF or build a new one. For example, the Corps has identified potential beneficial uses of dredged material in the New York/New Jersey Harbor DMMP, although many of these beneficial uses face strong public opposition due to the concentration of contaminants found in much of the sediment. However, the DMMP will be a vehicle for advancing beneficial use if the contamination and public perception issues can be addressed through treatment technologies and education, respectively. If beneficial use was incorporated into DMMPs as a priority, the DMMP could provide a vehicle for advancing, instead of impeding, beneficial use.

9. **Cooperative and continuous planning processes should be established to manage material dredged from federal and non-federal navigation and recreation channels with a priority for beneficial use options. Ports' strategic planning processes are a logical vehicle to plan for local dredged material management needs and priorities from both navigation and non-navigation channels.**

Material that is dredged outside of federal navigation channels must also go somewhere. States, in cooperation with ports and local governments, should establish general planning guidelines and assistance to help local governments implement management plans for material that is dredged outside of federal navigation channels. Incorporation of dredged material management plans into ports' strategic planning processes provides a mechanism for local planning for dredged material management. This would allow for managing dredged material from federal navigation and non-federal navigation channels as well as small recreation channels. It should be noted that sediments outside regularly dredged navigation channels can be significantly more contaminated than the material from channels that are dredged on a regular basis. Stakeholders should consider these factors as they establish planning processes for non-federal channels.

10. **Potential areas where dredged material could be beneficially used in state-funded or state-assisted projects should be identified by relevant state and local agencies. Federal guidance developed pursuant to recommendations #3 and #4 above should be used by states in this process. Beneficial use of dredged material in nearshore, in-water and upland scenarios could include, but not be limited to: habitat restoration, land reclamation (e.g., brownfields, minelands), topsoil creation/enhancement, landscaping, shore protection, beach nourishment, replacement fill, capping and construction.**

Beneficial use could be facilitated if projects that could use dredged material were already identified and the need for beneficial use projects was established in DMMPs or similar documents. For example, state agencies that use soil or fill for a variety of purposes may be able to take advantage of ready supplies of dredged material, provided the dredged material meets the physical and chemical needs of the project. State and local agencies are best suited to identify the characteristics of material that could meet their project/program needs. Identifying such needs will facilitate beneficial uses by providing a ready market. To facilitate this effort, states may need to institute a planning

exercise, similar to a DMMP, which evaluates the possible uses and identifies a strategy for addressing the dredging needs of a state and its harbors.

11. An interagency task force that coordinates beneficial use of dredged material for in-water and upland applications should be established.

Presently, most states have separate staff and programs to evaluate a beneficial use project involving dredged material. Typically, staff/programs that address water issues (specifically Section 401) evaluate proposals for beneficial use with an in-water application and staff/programs that address solid waste issues evaluate proposals for beneficial use with an upland application. Without adequate coordination, this separation of activities can result in lost opportunities for beneficial use, a lack of oversight of beneficial use projects, or inadequate evaluation of proposed projects. Having an interagency beneficial use task force or some other mechanism whereby coordination of different beneficial uses is institutionalized within the state will advance beneficial use and ensure more effective administration of projects. The task force could provide a forum for developing/modifying state guidelines and regulations pertaining to the beneficial use of dredged material. Additionally, the task force, as the state point of contact on beneficial use, could be responsible for facilitating, coordinating and overseeing the beneficial use of dredged material for the state. Each task force should have a contact person or liaison for coordination with relevant federal agencies. Having a single liaison as a point of contact will facilitate matching dredged material supply with demand. The same liaison also could be the point of contact for soliciting or responding to private interests in utilizing dredged material beneficially. It should be noted that some states may already have an equivalent structure in place, however, most Great Lakes states do not have an effective procedure for communicating and coordinating beneficial use activities. In those cases, an interagency task force may prove extremely valuable.

12. Public education campaigns about beneficial use of dredged material should be established.

States have experienced public skepticism over and resistance to beneficial use. Without a public education campaign, the public will likely continue to look unfavorably on beneficial use. The Great Lakes Commission has produced a booklet that answers basic questions about beneficial use and highlights selected beneficial use projects in the Great Lakes basin. However, state and local authorities need to establish project-specific public education campaigns that provide information about local beneficial use projects. Any federal guidance developed for evaluating beneficial use projects should be publicized as part of a campaign so that the public is aware of the tradeoffs associated with beneficial use versus other disposal/management options. To facilitate a high level of public involvement, public education campaigns should be considered early and throughout state and federal permitting processes. Public education campaigns will facilitate public stakeholder support and foster the continuation of existing beneficial use projects and/or the establishment of new ones.

13. Business outreach programs about beneficial use of dredged material should be established.

Businesses have indicated their interest in using dredged material for certain purposes but complain about regulatory uncertainty and agency resistance. Any effort on the part of states to promote beneficial use would be enhanced through the cultivation of private sector contacts and ideas about possible uses. Marketing and outreach geared toward beneficial use by businesses would foster demand for dredged material. Grants to the private sector would facilitate cooperative projects to develop multi-purpose dredged material use opportunities. Section 215(a) of the Water Resources Development Act of 2000, which calls on the Corps to establish a program to allow the direct

marketing of dredged material to public and private entities, holds promise for jumpstarting the development of markets for dredged material.

14. Monitoring programs for beneficial use projects should be established and implemented.

A main public concern about beneficial use is the potential medium and long-term impacts of dredged material on human health and the environment. People want to be sure that the material that is being used beneficially is not going to harm them, their children or their surrounding environment. The establishment of monitoring programs for beneficial use projects, either through the permit process or independently, as well as publicity of monitoring results, will go a long way in reassuring the public about the benefits of beneficial use. Monitoring need not be the same for all beneficial use projects, and site-specific monitoring should be considered. For example, where the material is uncontaminated, monitoring may be limited to an assessment of whether the material is serving the intended purpose. Where material contains contaminants and is subject to exposure controls, monitoring of such controls and/or the site should take place. Types of monitoring may include, but not be limited to: benefit realization monitoring, chemical/physical monitoring, compliance monitoring and exposure control monitoring. Participants at the New Orleans workshop noted that the lack of funding was an obstacle to monitoring. Federal, state and local agencies should work together to ensure that funding or in-kind contributions for monitoring are built into the project costs. Local citizen volunteers might be a potential resource to assist in this effort. Where funding for monitoring is limited, monitoring should be prioritized for areas where there is a public health or environmental concern.

15. Guidance for monitoring protocols should be developed where beneficial use involves contaminated dredged material.

All beneficial use of dredged material should occur in ways that are protective of human health and the environment. Appropriate dredged material testing and evaluation and end uses based on associated risks should ensure that outcome. However, beneficial use applications that involve contaminated materials being used at a particular location can raise public concerns about such applications, particularly if the end use relies on engineering or institutional exposure controls. The development of generally accepted methods for monitoring such beneficial use projects will help ensure their safety and build greater public support.

16. The current Corps' authority for beneficial use of dredged material (Section 204, WRDA 1992) should be expanded to include all beneficial uses. Beneficial uses include, but are not limited to: habitat restoration; topsoil creation/enhancement; landscaping; land reclamation (e.g., brownfields, minelands); shore protection, beach nourishment; replacement fill; capping; and construction materials for in-water, nearshore and upland scenarios.

Currently, Section 204 of the Water Resources Development Act (WRDA) authorizes the Corps to protect, restore and create aquatic habitat, including wetlands, in connection with dredging at authorized federal navigation projects. The Corps has extensive technical and engineering experience with both defense and civil works projects that can be applied to many potential beneficial use projects. A logical next step is to combine the expertise of the Corps with potential beneficial use projects through rewording of Section 204 to reflect all beneficial use options. The Great Lakes Commission supports the rewording of Section 204 to include a wide range of beneficial uses of dredged material.

17. **Federally approved state coastal management programs should be reviewed and, where practicable, modified to incorporate the beneficial use of dredged material as a policy priority, and to reflect state laws and policies that pertain to beneficial use.**

Federally approved state coastal zone management programs (CMPs) can be a vehicle for promoting beneficial use of dredged material. CMPs must address several national objectives, including natural resource protection, protection from natural hazards, priority consideration of coastal dependent uses, public access, coordinated decisionmaking, public participation, comprehensive planning, and affects of changing water levels/land subsidence. These programs can serve to advance beneficial use by expressly identifying beneficial use as a policy priority. States can do this as part of their routine program update process to reflect changes to existing state law that is incorporated into their CMP.

Under the federal Coastal Zone Management Act (CZMA), federal projects must be consistent with state CMPs. Such projects include dredging and disposal activities conducted by the Corps. Though it is the responsibility of the Corps or other applicant of a dredging permit to demonstrate consistency with a state CMP, states can advance beneficial use of dredged material by clearly identifying those enforceable laws and policies that would generally pertain to beneficial use of dredged material, including both in-water and upland scenarios. Certain state laws and policies may pertain to beneficial use of dredged material in some cases and not in others. However, proactively spelling out those policies and regulatory procedures that would generally apply to beneficial use of dredged material would provide a starting point for consideration by those entities involved with dredged material management.

Littoral nourishment in Conneaut, Ohio, is an excellent example of how CMP consistency can work in favor of beneficial use of dredged material. In this case, Pennsylvania's CMP encourages actions that promote shoreline stability. Pennsylvania's coastal zone management program with support from the state's Office of the Great Lakes and other state and local officials and agencies, used the consistency provisions of the CZMA to request that the Corps use sediment dredged from Conneaut Harbor beneficially for littoral nourishment. Through their CMP, Pennsylvania placed conditions on the federal dredging activities at an Ohio harbor to achieve consistency *and* beneficial use.

Section 309 of the CZMA establishes a voluntary coastal zone enhancement grants program to encourage states to develop program changes in one or more of the following nine coastal zone enhancement areas: wetlands, public access, coastal hazards, cumulative and secondary impacts, energy and government facility siting, marine debris, ocean resources, special area management plans, and aquaculture. Under this program, the Secretary of Commerce is authorized to make awards to states to develop and submit, for federal approval, program changes that support attainment of the objectives of one or more of the enhancement areas. Incorporating beneficial use projects or end uses that meet these objectives into an enhancement grants proposal could be another avenue for Great Lakes states to advance beneficial use in their coastal areas.

18. **Funding opportunities should be established for research and development of new treatment technologies to address contaminated dredged material to promote beneficial use(s).**

Contaminated dredged material must be treated to render it suitable for beneficial uses. Treatment involves reducing, separating, immobilizing and/or detoxifying contaminants. There are a number of dredged material treatment technologies that are being developed and tested, but more funding for pilot projects, research and development, and full-scale startups is needed. (See Section V of this report for a discussion of treatment technologies.) The U.S. EPA, the Corps and state agencies should develop procedures and funding for promoting treatment technology research and development as well as subsidizing the extra expenses associated with decontaminating/ encapsulating dredged material for beneficial use projects.

III. Great Lakes Dredging Team Beneficial Use Implementation Strategy

A work group of the Great Lakes Dredging Team (GLDT) was formed at the Oct. 4-5, 2000, meeting to prioritize the 18 recommendations developed by the Beneficial Use Task Force noted in Section I of this report. Although all of the recommendations are considered important, five of highest priority have been selected to form the basis of the following GLDT preliminary work plan to address the beneficial uses of dredged material.

Primary Objective: To increase the beneficial reuse of dredged material from navigation channels, ports, harbors, marinas and connecting channels of the Great Lakes.

Strategy #1 (Recommendation 16)

Expand the current federal program for beneficial use of dredged material (Section 204, WRDA 1992) to all beneficial uses, including but not limited to: habitat restoration; topsoil creation/enhancement; landscaping; land reclamation (e.g., minelands and brownfields); shore protection; beach nourishment; replacement fill; capping; and construction materials for in-water, nearshore and upland scenarios.

Activity: State caucus of the Great Lakes Regional Dredging Team works with other regional and local groups to lobby Congress for an amendment to expand the scope of beneficial use applications within the authority of Section 204, WRDA 1992.

Strategy #2 (Recommendations 2, 3 and 15)

Develop risk-based guidance that establishes contamination thresholds or parameters for different beneficial use applications based on the physical and chemical properties of the dredged material and its desired end use. This guidance should use a comparative, risk-based approach for dealing with contaminants instead of strict numerical standards yet could allow for case-specific determinations that consider of the range of physical and chemical characteristics of dredged material and exposure pathways associated with its end use. Combine this effort with the recommendations to develop testing and monitoring protocols for dredged material.

Activity: Great Lakes states take the lead through the GLDT with technical and financial support from the U.S. EPA and the Corps to develop a regional manual on beneficial use testing, monitoring and interpretation. Perhaps Michigan's current approach could be evaluated as a possible model.

Strategy #3 (Recommendation 5)

Modify the federal standard to promote beneficial uses of dredged material and develop guidance on how the federal standard is applied. In support of a modified federal standard, such guidance should clarify how the federal standard is applied and should acknowledge that the federal standard is a flexible policy. The federal standard should be applied based on an evaluation of the net social, environmental and economic benefits and impacts/costs of different dredged material management options – not strict adherence to a least costly alternative based on present value.

Activity: GLDT state caucus works with other states and regional dredging teams to lobby Congress and the Corps for a change in Corps' regulations.

IV. Beneficial Uses of Dredged Material: Selected Projects in the Great Lakes Basin

The following project descriptions are broken down into six categories of beneficial use: beach/littoral nourishment, habitat restoration, topsoil creation/enhancement, capping, landscaping and construction materials. Some projects may be considered more than one type of beneficial use and are cross-referenced accordingly. Projects are listed by state under each category. Contact information is provided for obtaining further information about each project.

1) Beach/Littoral Nourishment

Beach nourishment became a standard practice largely with the passage of the 1968 Rivers and Harbors Act. Section 111 of the Act authorized beach nourishment as a mitigation measure of shore damages attributable to in-water structures, such as jetties and breakwaters, that hampered natural littoral nourishment. The Great Lakes' coasts are subjected to wind and wave action and natural littoral drift of sand and sediment along the shore. If material is not replaced through natural littoral movement, beaches and shorelines erode. Where erosion is a problem, strategic placement of dredged material along the shore or offshore can provide a source of nourishment for littoral movement or recreational beach improvement and creation.

Illinois

At Waukegan Harbor, Illinois, approximately 50,000 cubic yards of clean sandy material from the entrance channel of the harbor is dredged annually and placed nearshore to provide a source of nourishment for littoral movement. Most recently, the dredged material has been placed nearshore off of Illinois Beach State Park several miles north of Waukegan. Prior to that, the dredged material was placed nearshore south (downdrift) of Waukegan Harbor. Dredging is performed by mechanical dredge and transported by barge to disposal location.

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Clean, sandy material dredged from Wilmette Harbor (maintenance dredging) is clamshelled onto a barge and off-loaded downdrift of the harbor for beach nourishment.

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Indiana

At Michigan City Harbor, Indiana, approximately 85,000 cubic yards of sandy material from the outer harbor was dredged in 2000 by hydraulic dredge and pumped onto the beach west

(downdrift) of the harbor. The beach at this location is part of the Indiana Dunes National Lakeshore. The beach nourishment helps prevent erosion of Mt. Baldy, the major sand dune at the eastern terminus of the national lakeshore. In past periodic dredging, when the outer harbor has been dredged, the material also has been disposed on the beach.

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At Burns Waterway Small Boat Harbor, Indiana, approximately 142,000 cubic yards of material from the harbor was dredged in 2000 by hydraulic dredge and pumped to the beach west (downdrift) of the harbor. The beach in this area is part of the Indiana Dunes National Lakeshore. This was the first time Burns Waterway Small Boat Harbor was dredged since being constructed in 1984.

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(Proposed)

Another project, currently in the planning stages, is underway to dredge sand from Calumet Harbor (in Indiana and Illinois) and place the material on Calumet Park Beach, Ill.; Hammond Marina Beach, Ind., and Whihala Beach, Ind. Sediment unsuitable for beach nourishment will be open-water disposed or placed in a CDF. Dredging is not yet underway.

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MICHIGAN

Beach/littoral nourishment projects occur regularly in Michigan. Clean sand dredged from the outer portion of navigation channels at many Michigan harbors is placed in the nearshore area either to the north or south of the harbor. Harbors where this occurs include Arcadia, Au Sable, Big Bay, Black River (Gogebic), Bolles Harbor, Grand Haven (outer), Grand Traverse Bay, Harrisville, Holland (outer), Lac LaBelle, Leland, Lexington, Little Lake, Ludington, Manistee, Menominee, Muskegon (outer), New Buffalo (outer), Ontonagon, Pentwater, Port Sanilac, Portage Lake, Saugatuck, South Haven, St. Joseph, White Lake and Whitefish Point. Approximately 400,000 cubic yards of dredged

material is used for beach nourishment throughout the state each year. This represents somewhere between 30 and 40 percent of all material dredged from federal navigation channels in Michigan each year.

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MINNESOTA

Clean sand dredged from Duluth-Superior Harbor entrance channels and basins was placed at Minnesota Point in 1996 and 1998 (113,000 cubic yards in 1998 and 50,000 cubic yards in 1996) and at Wisconsin Point, WI in 1983 and 1990 (45,000 cubic yards in 1990 and 44,000 cubic yards in 1983). The material was placed at various locations that were susceptible to erosion. Suitable "clean" dredging project areas were within a reasonable distance of the beach nourishment sites. This activity provided the impetus for ongoing beach nourishment, which continues at these locations.

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NEW YORK

New York state encourages the use of clean dredged material for beach enhancement projects along the Lake Erie coastline. An ongoing dredging program for small boat marinas and boat launch areas in the towns of Evans, Hamburg and the mouth of Cattaraugus Creek results in clean fill that is used to enhance sand beaches along the Lake Erie coast. The beach enhancements have contributed to the beaches becoming popular family recreation areas.

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OHIO

Several beach/littoral nourishment projects have been completed or are underway in Ohio.

- Sand dredged from the marina channel at Geneva State Park is placed in the nearshore east of the marina.
- A permanent hydraulic bypass system was installed at a marina near Huron, Ohio.
- Sand dredged during construction and maintenance of the West Harbor was placed nearshore at East Harbor State Park.
- Sand from Conneaut Harbor will be placed along the shoreline drift (east) of Conneaut into Pennsylvania.

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PENNSYLVANIA

Since the early 1900s when Conneaut, Ohio's, harbor was significantly altered for commercial navigation purposes, harbor structures have increasingly interfered with the eastward littoral drift of beach sand. This long-term blockage of littoral drift material effectively starves the beaches to the east of the harbor, leading to rapid erosion of the shoreline while creating sediment buildup in other parts of the harbor. The Corps' original plans, which called for open lake disposal, were revised pursuant to requests by Ohio and Pennsylvania to be consistent with state Coastal Zone Management programs that promote shoreline stability. As a result, approximately 40,000 cubic yards of clean sand dredged from Conneaut Harbor was placed along the Ohio shoreline of Lake Erie with the intent of allowing the material to nourish Pennsylvania's beaches through natural littoral drift.

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Presque Isle State Park, located along the Lake Erie shoreline, implemented an innovative erosion protection project, which included the beneficial use of dredged material for beach nourishment as well as shore protection. Approximately 40,000 cubic yards of clean sand dredged from a sand spit in Presque Isle Bay was de-watered then placed along a multi-purpose shoreline trail. The dredged material was placed over rip-rap to create a higher elevation dune line for greater protection against higher waves. The project combined the beneficial use of dredged material with landscaping and

native vegetation planting to reduce sediment loadings into Lake Erie and protect the natural and recreational features of Presque Isle State Park.

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WISCONSIN

Beach/littoral nourishment is conducted at several locations in Wisconsin.

- Clean sand from Two Rivers Harbor entrance is deposited north of the north harbor breakwater, adjacent to a public sand beach owned by the city of Two Rivers.
- Beach nourishment also has been successful at Sheboygan Harbor (outer).
- Material from Superior Harbor's entrance and inner harbor was mechanically dredged and transported to open water adjacent to a sand beach on Wisconsin Point. This project showed no effect on beach profile because the material contained large amounts of clay.
- Clean dredged material is regularly placed in areas subject to erosion at Port Wing and Cornucopia harbors by hydraulic dredge.

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2) HABITAT RESTORATION (E.G., WILDLIFE, AQUACULTURE, FISHERIES)

Dredged material can be used beneficially to enhance or create various wildlife habitats. Upland wildlife habitats created by the Corps are typically dredged material containment areas that are no longer used or have gone fallow for long periods. Native vegetation then provides food and cover for wildlife. Dredged material has also been extensively used to restore and establish wetlands. Wetlands restoration is a relatively common and technically feasible use of dredged material because transport and placement can be a cost-effective means of disposal. Also, specific authorities for the Corps under Section 204 of WRDA facilitate this type of beneficial use. Strategic placement of dredged material can replenish eroding natural wetland shorelines or nourish subsiding wetlands by serving as wind, wave and erosion barriers or providing shoreline stabilization. Offshore dredged material deposition also can improve fisheries habitat. Aquaculture also is a promising beneficial use because aquaculture ponds and dredged material containment areas share many design characteristics, including levees and control structures for water discharge.

MICHIGAN

Pointe Mouillee CDF

Pointe Mouillee CDF is located in the western end of Lake Erie at the mouth of the Huron River. The CDF has an 18,000,000 cubic yard capacity and was built to contain contaminated materials dredged from navigation channels in the Detroit and Rouge rivers. The beneficial use is derived from the shape and location of the CDF, which was designed to replace barrier islands that once existed in its location. Filled cells are covered by natural vegetation. The CDF has enabled regeneration of, and protection to, the Pointe Mouillee Marsh, which had been destroyed along with the barrier islands. The 2,000-acre marsh serves as habitat for waterfowl and other aquatic wildlife.

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MINNESOTA

21st Avenue West Channel (Proposed)

Uncontaminated material originally dredged from Erie Pier, in addition to sediment dredged from navigation channels at the Duluth-Superior Harbor, has been determined to be suitable for unrestricted upland use. Plans call for placement of 1 million cubic yards of dredged material at the 21st Avenue West Channel to remediate contaminated sediment by capping and creating 88 acres of aquatic habitat and upland nesting area in the St. Louis River Estuary. However, the project is on hold due to concerns of site contamination unrelated to the dredged material.

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NEW YORK

Brownfields restoration wetland creation at Lackawanna

In a unique multi-agency effort, The NYS Department of Environmental Conservation, Department of Parks and Recreation, the U.S. Fish & Wildlife Service and the Corps combined to plan and dredge access channels through filled wetlands in Buckhorn Island State Park, located at the north end of Grand Island in the Niagara River. The dredged channels increased open water and freshwater circulation within an area overgrown with cattails. The open channels are experiencing an increase in fish spawning and migratory waterfowl. The dredged material was richly impregnated with various wetland and grass seeds. The dredged material was used to reseed a pond at a Lackawanna, N.Y., brownfield site, where U.S. EPA had conducted an emergency removal of hazardous contaminants from a former industrial plant site. The pond responded quickly. Within the first six months, the seedlings had germinated and the pond grew in with a rich assortment of grasses and shrubs to provide habitat.

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OHIO

Sandusky bay wetland creation (proposed)

Uncontaminated material dredged from navigation channels at Sandusky Harbor is proposed to be used in the restoration of nearshore wetlands along the shore of Sandusky Bay. The proposed project includes the staged construction of containment dikes and cells to dissipate waves causing onshore erosion that is compromising the safety and effectiveness of a nearby rail causeway owned by Conrail. Dredged material would be used to restore and maintain the coastal wetland that once fronted the causeway, providing protection to the eroding shoreline and restoring causeway stability. The proposal calls for placing approximately 200,000 cubic yards of suitable dredged material in each of the cells over a seven to 10-year period. This would result in the creation of 25-50 acres of wetlands each year or on the order of 250 acres over the life of the project. The dredged material from Sandusky Harbor currently is being disposed in an open lake disposal area.

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MINNESOTA

See Mineland Reclamation-wetland Creation under "Landscaping."

WISCONSIN

Pensaukee Harbor barrier island creation

Approximately 55,000 cubic yards of uncontaminated material dredged from the Pensaukee Harbor and entrance channel were placed down-drift of the harbor, creating a 4.6 acre, rectangular-shaped island. The dredged material consisted of fine to medium-grain sands. Subsequent wave action has altered the original configuration into a fish-hook shaped island, which provides habitat for colonial nesting birds, state-listed endangered species and migratory waterfowl. The island also provides erosion protection by shielding an extensive wetland located in the Pensaukee State Wildlife Area on the lee side of the island.

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Cat Islands restoration

A chain of four small islands in southern Green Bay, known as the Cat Islands were washed away in the 1970s by high water levels, storm waves and ice shoves. Sediment from farm fields, construction sites and other land uses in the watershed caused significant erosion that destroyed much of the rich vegetation that once surrounded and protected the islands. Also, shoreline hardening in response to rising lake levels and storm floods caused wave action to be reflected back into the bay instead of being absorbed by natural gradually sloping shorelines and aquatic vegetation. This further destroyed the surrounding vegetation and eroded the islands. In 1996, $5 million was provided under the federal Water Resources Development Act to beneficially use dredged material to restore the aquatic ecosystem of the Cat Islands. The project is still in the planning stages. Plans call for using dredged material from the outer bay to reconstruct the islands, and construction is likely to begin in spring 2003. Sediments from the outer bay contain very low levels of PCBs, which are lower than levels in the area where restoration is proposed. Sediments used to build the island will be capped with clean sand. The project is a collaboration with the Brown County Port Authority, the U.S. Army Corps of Engineers-Detroit District, the U.S. Fish and Wildlife Service, the Wisconsin DNR and other organizations.

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3) TOPSOIL CREATION/ENHANCEMENT

Dredged material is commonly composed of silt, sand, clay and organic matter, all important components of topsoil. Dewatering and conditioning of dredged material has promise for developing products that can be used in topsoil creation or structural enhancement.

MINNESOTA

Reusing sediment from Erie Pier CDF for topsoil

The chemical and physical makeup of the sediments in the Erie Pier CDF–clean sand, silt and clay–make the dredged material potentially very useful as a soil amendment or as a construction material. The state of Minnesota, in cooperation with the Duluth Seaway Port Authority, is considering the use of the fine material left after the sand has been separated as a soil amendment for mineland reclamation applications. See "Mineland Reclamation-Wetland Creation" under "Landscaping."

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OHIO

Toledo-Lucas County Port Authority demonstration projects

The Toledo-Lucas County Port Authority is involved with several initiatives to remove and reuse dredged material from the Toledo Harbor CDF.

One effort involves mixing the dredged material with the sewage sludge and lime sludge (drinking water supply residue) to create a topsoil product. The resulting material has restricted uses (class B) due to concerns regarding pathogens from the sewage sludge, but can be used for landfill cover and other restrictive uses. The city of Toledo uses the resulting soil as the final vegetative cover for the city's landfill, eliminating the need to purchase other cover for the landfill. The material also has been used in landscaping at the entrance way to Maumee Bay State Park, at the Toledo shipyard, at a local park and along roadways. Use restrictions would be removed if the material is allowed to sit for at least one year, allowing the level of pathogens to reduce naturally.

A second demonstration project involves mixing dredged material from the CDF with yard waste to make an unrestricted top soil. A third demonstration project being undertaken by a local utility involves mixing the dredged material with fly ash, a by-product of the utility, to create a construction grade soil/aggregate. This would allow the utility to reuse its own waste and create a product by combining it with dredged material.

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WISCONSIN

Topsoil creation demonstration projects at Green Bay and Milwaukee

The Detroit District of the U.S. Army Corps of Engineers, in cooperation with other partners, is testing technologies to treat contaminated dredged material for purposes of developing a marketable topsoil product. Material dredged from Green Bay and Milwaukee navigation channels is subject to hydrocyclone technology, which separates clean sand from contaminated silts and clays. The silt is dewatered in the respective CDFs and the sand is removed and can be used beneficially. In Green Bay, a pilot project is underway that involves mixing the sand with organic matter to create a topsoil. In Milwaukee, material is treated by mixing it with organic biosolids (e.g., sewage sludge or manure) and woodchips to degrade contaminants,with the intent to produce a marketable topsoil product.

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4) CAPPING

In-water capping involves the placement of clean or relatively clean dredged material in the formation of a wave-and current-resistant layer on top of previously deposited contaminated material. Upland capping provides a means of isolating underlying contaminated soils from the surrounding environment. Moisture content and grain size are important factors in determining the suitability of dredged material for capping. The proximity to the capping site is an important consideration for project costs associated with transporting the material. Sand, clay or mixed materials may be used for both open-water and upland locations, depending on the specifics of the site. As with other beneficial uses, the availability of other sources of material and the willingness of local sponsors to share costs associated with beneficial use are also important factors.

ILLINOIS

Capping the former Johns-Mansville industrial site (Proposed)

The Waukegan Harbor Comprehensive Dredging Management Plan is scheduled to be completed in August 2001. This plan addresses proposed dredging and disposal activities at Waukegan Harbor, including the resumption of maintenance dredging, the removal of contaminated sediments outside the federal channels, and deepening of the existing federal channels. There has been considerable

support for disposal and capping of Waukegan Harbor dredged material in an existing contaminated settling basin at the Johns-Mansville former industrial site two miles north of the harbor, one of the disposal alternatives considered in the study. The current plan is the result of cooperation and coordination between the Corps of Engineers and the local sponsor, together with local, state and federal advisors and partners.

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MICHIGAN

Capping at Port Huron Township landfill

In 1990 and 1991, approximately 41,500 cubic yards of dredged material from the Black River channel at Port Huron was placed directly on a landfill site in Port Huron Township to serve as the final cover of the site cleanup. The capping activity was part of the closure plan for the contaminated landfill site under the state Superfund program (Act 307). The dredged material consisted of clean, silty sand and was loaded directly into trucks and hauled to the landfill.

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Berrien County landfill closure

Silty sand originally dredged from the St. Joseph River was placed in the Whirlpool CDF at St. Joseph Harbor. In 1992 approximately 24,000 cubic yards of dredged material was removed from the CDF, allowed to dewater, transferred into trucks and transported to the southeast Berrien County landfill for use as fill under the final landfill cap. Moderately contaminated with metals and high levels of nutrients, the dredged material provided an intermediate cap between the highly contaminated landfill and the final cap as part of a site closure plan under the state Superfund law (Act 307).

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MINNESOTA

Superfund site remediation projects (proposed)

The state of Minnesota, in cooperation with the Duluth Seaway Port Authority, is exploring the use of clean dredged material from the Erie Pier CDF as a remedy for environmental cleanup at several contaminated sites. These include the placement of 150,000 cubic yards at the USX (federal Superfund) site, 400,000 cubic yards at the Interlake/Tar (federal Superfund) site, and 1 million cubic yards at the 21st Avenue West channel site. In some cases, capping would also provide for habitat creation.

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WISCONSIN

In 1992, approximately 51,000 cubic yards of clean, sandy material dredged from Oconto Harbor was used as the final cap as part of a site closure plan for an abandoned landfill in the City of Oconto. The dredged material was mechanically dredged, loaded into trucks and hauled to the final disposal area to serve as the inert capping material.

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5) LANDSCAPING (E.G., LAND CREATION, IMPROVEMENT, LAND/MINELAND RECLAMATION, SHORE PROTECTION, REPLACEMENT FILL)

There are various beneficial uses of dredged material that fall under landscaping uses. Shore protection, including the building of dikes and berms; land improvement when the quality of existing land is poor; and land creation, including filling, raising and protecting submerged and low-lying areas; and mineland reclamation, are examples of landscaping beneficial use. Landscaping with dredged material can have other beneficial uses where such applications serve more than one purpose, such as capping or habitat creation.

INDIANA

Reuse of Trail Creek dredged material (proposed)

Lightly contaminated material dredged from Trail Creek in Michigan City is proposed be placed in as yet unidentified upland locations that have existing contamination similar in extent and

concentration. Dredged material that is too contaminated does not qualify for beneficial use and will be disposed of in a CDF.

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See Point Mouillee CDF under "Habitat Protection."

St. Joseph Airport runway enhancement

Since 1996, 48,000 cubic yards of mildly contaminated material dredged from the inner navigational channel at St. Joseph Harbor have been removed from the Whirlpool CDF and placed at the St. Joseph regional airport. Dredged material has been used to fill runway depressions just north of the main runway adjacent to the navigation tower, leveling the runway and improving radar effectiveness at the airport. Since the arsenic levels in the dredged material are above Michigan's allowable human direct contact criteria, Michigan DEQ required clean cover and a deed restriction on the placement area.

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St. Joseph Airport runway extension (proposed)

Dredged material from St. Joseph harbor is proposed to be used at the St. Joseph Regional Airport. Existing soil on site at the airport would be excavated and used to construct a runway extension and dredged material would be used to backfill the holes created by the excavation. (Originally dredged material was proposed to be used directly for the runway creation, but the nature of the dredged material–silts and clays–is not suitable for that purpose). The Michigan Department of Transportation has contracted out for an analysis of potential impacts on nearby wetlands and floodways. The results of the analysis will in large part determine whether the project is feasible and can move forward.

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MINNESOTA

Mineland reclamation-wetland creation

In 1997, the U.S. Army Corps of Engineers, in cooperation the Minnesota Department of Natural Resources, National Steel Mining and the Duluth Seaway Port Authority, commenced a pilot project to use clean dredged material from the Erie Pier CDF as a substrate to create wetlands on lands disturbed by mining. Two small demonstration areas were established and produced excellent results. Based on the success of this pilot, a cooperative project was initiated between the U.S. EPA, the U.S. Army Corps of Engineers, the Minnesota Department of Natural Resources, EVTAC Mining and the Duluth Seaway Port Authority. The goal of this project is to create a five-acre wetland within a closed taconite tailings basin. In 2000, 3,000 cubic yards of dredged material was moved from the Erie Pier CDF to the EVTAC site using the Duluth, Missabe & Iron Range Railway and awaits application for the wetland creation in late 2001. It is estimated that there could be as many as 1,000 acres of the tailings basin that would be suitable for future wetland creation.

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City of Duluth Bayfront Park

Approximately 86,000 cubic yards of sandy material dredged from navigation channels in Duluth-Superior Harbor in 2000 was taken to the Erie Pier CDF where it was washed and stockpiled. Private contractors working for the city of Duluth and the Duluth Economic Development Authority purchased about 138,000 cubic yards of the washed dredged material, which was used to

fill in tow old slips owned by the city of Duluth and create the Bayfront Festival Park on the Duluth waterfront.

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OHIO

See Toledo-Lucas County Port Authority Demonstration Projects under "Topsoil Creation."

PENNSYLVANIA

See Presque Isle State Park under "Beach/Littoral Nourishment."

WISCONSIN

Industrial park development at Big Suamico Harbor

The community of Suamico wanted to expand an existing industrial park area, but needed construction fill to bring the area up to grade with the surrounding area. Between 1989 and 1993, the Corps provided approximately 55,000 cubic yards of material dredged from Big Suamico Harbor, primarily sand, which was suitable for fill and development of the industrial park.

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See Pensaukee Harbor Barrier Island Creation under "Habitat Restoration."

6) CONSTRUCTION MATERIALS

Dredged material may be used in construction materials as backfill material, aggregates, for concrete, mortar, bricks, ceramics (such as tile) and as raw material for the production of riprap. New technologies, a steady or increasing demand for construction materials, diminishing access to or increasing cost of traditional sources, and a more predictable regulatory process have the potential to advance this type of beneficial use.

MICHIGAN

Detroit River "Black Lagoon" remediation demonstration project (proposed)

Contaminated dredged material from the "Black Lagoon" portion of the Detroit River is proposed by the state (in cooperation with U.S. EPA and the Gas Technology Institute of Des Plains, Ill.) to be used in a pilot project to demonstrate plasma vitrification technology for treatment of contaminated sediments. The proposed project would dredge 30,000 cubic yards of material from

the Black Lagoon area and use 5,000 cubic yards in the demonstration project. The resulting product would be a glassy aggregate that could be used in the manufacture of portland cement, a marketable product. The balance of the material is proposed to go to the Point Mouillee CDF. Corps officials have not rendered a decision with respect to the permits required to conduct the dredging and disposal activities. State approval also may be required.

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MINNESOTA

Construction projects–city of Duluth

The city of Duluth purchases dredged material from the port authority on an ongoing basis for a number of other construction-related projects.

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See Reusing Sediment From Erie Pier CDF under "Topsoil Creation Enhancement."

OHIO

See Toledo-Lucas County Port Authority Demonstration Projects under "Topsoil Creation Enhancement."

WISCONSIN

Glass aggregate production

Contaminated sediments dredged from the Fox River are proposed to be treated to produce a glass aggregate. This pilot test will be conducted for two weeks. Approximately 70 tons of dewatered contaminated dredged material will be treated using a patented glass furnace (vitrification) technology. The dredged material contains high levels of PCBs and mercury. Based on bench scale tests and the performance of other full-scale vitrification systems, Wisconsin DNR expects that this project will meet all standards for unrestricted use. If cost projections hold true, treatment costs will be comparable to certain landfilling options but, unlike landfilling, provide the benefit of physically destroying or immobilizing contaminants in a useful end product (glass aggregate). The glass aggregate can be used for construction applications, such as foundation backfill, road beds, floor tiles, abrasives, roofing shingles and asphalt and chip seal aggregates. The project is funded by Minergy Corp., Wisconsin DNR, and the U.S. EPA-Great Lakes National

Program Office with assistance from the U.S. EPA Superfund Innovative Technology Evaluation (SITE) program.

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V. Selected Technologies for Beneficial Use of Contaminated Dredged Material

One of the key issues facing the beneficial use of dredged material is how to address contaminated sediments. While material from some areas within the Great Lakes basin is considered "clean" many sediments within and outside federal navigation channels is contaminated. Contaminated dredged material must be treated to render it suitable for unrestricted beneficial uses. Treatment involves reducing, separating, immobilizing and/or detoxifying contaminants. Below is a brief description of several innovative technologies that have been used to decontaminate or stabilize contamination of dredged materials. The field of sediment treatment technologies is rapidly evolving and not all technologies available to date are mentioned here. Several of the following descriptions of innovative technologies for the beneficial use of dredged material have been excerpted from a report produced by Harding Lawson Associates of Novato, Calif., in April 2000. Additional information was provided by staff at the U.S. Army Corps of Engineers-Detroit District and the Waterways Experiment Station and proceedings from a workshop on contaminated sediments sponsored by U.S. EPA's Great Lakes National Program Office in Ann Arbor, Mich. in April 2001.

Online Resources for Additional Information About Sediment Treatment Technologies

- U.S. Army Corps of Engineers DOER Technical Notes www.wes.army.mil/el/dots/doer/technote.html
- The U.S. Environmental Protection Agency's Superfund Innovative Technology Evaluation www.epa.gov/ORD/SITE/
- Contaminated Sediments in Ports and Waterways: Cleanup Strategies and Technologies http://stills.nap.edu/books/0309054931/html/
- U.S. Army Corps of Engineers Center for Contaminated Sediments www.wes.army.mil/el/dots/ccs/
- CLU-IN Hazardous Waste Clean-Up (U.S. EPA Technology Innovation Office) www.clu-in.org/

1) Particle Separation/Soil Washing

Soil washing involves separating sediment particles based on size, density or surface chemistry differences. Since contaminants tend to associate with fine grain and organic materials, removal of these fractions may render the remainder of the material suitable for beneficial uses. Soil washing also may include chemical processes to treat remaining contaminants after particle separation.

Soil washing techniques have been demonstrated in the Great Lakes basin at the Erie Pier CDF in Duluth, Minn.; the Bay Port CDF in Green Bay, Wisc.; and at the Saginaw Bay CDF in Michigan.

At Erie Pier, soil washing involves separating the material by a relatively simple sluicing process. Dredged material is offloaded at the head of a sloping trench within the CDF, and water is pumped from the impoundment over the dredged material. The fine particles are carried down into the impoundment, and the coarser, cleaner material settles out in the trench. This material is then excavated and used generally in construction projects as well as in a pilot project involving habitat creation, mineland reclamation and capping. The fine-grain material goes into the CDF. Approximately 15 percent to 20 percent of the incoming material at Erie Pier is removed as sand each year, about 15-20 thousand cubic yards.

A hydrocyclone is often an integral part of a sediment particle separation plant. The hydrocyclone separates the feed material on the basis of size and density. Material is fed into the hydrocyclone machine tangentially, creating a vortex in which the contaminated fine material and some of the light,

organic material separate from the coarse material. The sand is discharged through the bottom of the cyclone (underflow) while the fine and light materials are discharged through the vortex finder at the top of the cyclone (overflow). The silts and clays are then either dewatered mechanically or pumped into the CDF for settling. The sand can be stockpiled for confirmatory testing and subsequent beneficial use. This technology was recently piloted at the Bay Port CDF by the U.S. Army Corps of Engineers-Detroit District and Waterways Experiment Station using a mobile hydrocyclone unit fed by a jet pump. The jet pump excavated the feed materials directly from the CDF. The chief advantage of this approach over other equipment alternatives is its simplicity. The system performed relatively well, producing an underflow containing less than 10 percent fine-grained material by volume and reducing contaminant levels by an order of magnitude as compared to the overflow. The advantage of the hydrocyclone is that the equipment has few moving parts and needs little oversight. The disadvantages are the requirement to slurry the dredged material, which then requires capturing and dewatering the fine-grained material if remediating the fine material is desired.

The main advantages of soil washing include preservation of CDF capacity and the reduced need to import or purchase other sources of sand. The principal disadvantage of the operation at Erie Pier is that it is a relatively low efficiency process. Water must be stored in the CDF and most of the material (about 80 percent) is not recovered and remains in the CDF, making soil washing a short-term solution. It is possible that more material could be recovered with a soil washing plant tailored to the material in Erie Pier and the selected end use of the material. This would be a more expensive alternative, however, and the benefits would need to be weighed against the costs. One of the disadvantages of soil washing in general is the potential for producing a sediment fraction in which the contaminants are so concentrated that they are not even suitable for disposal in a CDF. Preliminary characterization of the material to be processed, followed by pilot testing, is therefore important to provide an indication of the character of the expected process streams.

Full-scale processing costs for soil washing are still not well defined, and are site specific. Costs for similar projects can be found in the literature and incorporate not only the core separation processes, but also costs associated with disposal of contaminated residuals, transportation, water treatment, and administrative and engineering costs. Reported costs range from roughly $15/cubic yard for separation and stockpiling of uncontaminated material up to several hundred dollars per cubic yard for all project costs associated with highly contaminated materials.

A barge-mounted pilot-scale system of a soil washing plant developed by Bergmann Inc. was demonstrated over five days in April 1992 in the Saginaw Bay of Lake Huron just offshore of Essexville, Mich. The soil washing plant developed by Bergmann is more elaborate than either the Erie Pier or Green Bay processes, but operates on essentially the same principles. Materials must be excavated and oversize materials removed or excluded from subsequent processes. Material must then be slurried for separation and/or treatment. In the Bergmann plant, materials are excavated and screened to remove coarse rock and debris. Screened material is slurried for processing. The slurry is fed into an attrition scrubber followed by other mechanical equipment, such as hydrocyclones and settling tanks, designed to remove silts and clays from granular particles. Coarse/granular materials recovered through soil washing can be used as construction fill, or as raw materials in concrete or asphalt.

Chemical extraction is a step beyond the physical process of particle separation. Chemical extraction can improve contaminant solubility by adding surfactants, acids, bases and chelators. Removal efficiency of this process depends on the porosity of the material and the treatment time. The extraction process operates at a temperature of between 37 and 60 °C. Extraction processes can be interfaced with separation processes, which can improve overall cost effectiveness by reducing the fraction requiring chemical treatment. Or, extraction can be used to treat the finer particles after separation.

Finer grain materials are typically de-watered before treatment or, as appropriate, disposal. The wash water is treated to remove metals and organics, and recycled to the plant for reuse. Soil washing effectively concentrates PCB and metal contaminants in the fine-particle fraction.

Soil washing technologies also have been developed by BioGenesis, Inc. and Roy F. Weston, Inc. using a blend of biodegradable detergents, chelating and oxidizing agents, and high pressure water jets to remove both organic and inorganic contaminants. This blend of mechanical and chemical processes to clean contaminated sediments showed reduction of the organic compounds by approximately 90 percent and the inorganic compounds by approximately 70 percent. The process produces an end material that is suitable for use as a base for manufactured topsoils. A full-scale processing plant could operate on a scale of 275,000 cubic yards per year. Production costs for soil washing techniques were estimated at $30-$50 per cubic yard. A disadvantage of this technique is that in order to become available at a large-scale operation (>500,000 cubic yards per year), a very large treatment/handling facility would be required.

2) Composting/Bioremediation

Composting involves mixing dredged material with organic matter and wood chips to degrade organic contaminants in dredged material. The biosolids (e.g., sewage sludge or manure) provide nutrients and microbes and the wood chips provide moisture. The materials are placed in mounds and periodically turned and mixed to aerate and enhance biodegradation. This technology is being piloted by the U.S. Army Corps of Engineers-Detroit District in the Great Lakes basin at the Milwaukee and Green Bay CDFs in an attempt to create a marketable topsoil.

Composting dredged material also has been used to create topsoil at the Toledo Harbor CDF. The resulting topsoil has been used for landfill capping and landscaping throughout the city of Toledo. Topsoils manufactured from dredged material also have been used to cap brownfield and Superfund sites. Scott and Sons Company has developed a process, in which dredged material is mixed with cellulose waste such as yard waste (e.g., grass clippings), sawdust and waste paper along with biosolids to produce a topsoil for sale to municipalities and the public. In a similar process, the N-Viro Company produces soils using freshwater dredged material augmented with biosolids, kiln dust (an alkaline industrial by-product) and fertilizer to produce a potting and topsoil product sold to the public.

Great Lakes pilot projects for dredged material composting at Green Bay and Milwaukee have resulted in about a 40 percent reduction in PCB concentrations. Other advantages are that composting is an age-old technique that is relatively simple, low-cost and "low-tech." Moreover, composting productively reuses three or more solid waste products that would otherwise be going into landfills. The disadvantages of composting are that it requires large land area and will not directly reduce metals or PAH concentrations. However, metals concentrations in dredged material at Green Bay and Milwaukee have only been problematic for in-water applications. Thus concentrations may be reduced to acceptable levels by mixing the final product with woodchips and biosolids for upland uses. (Other technologies, including phytoremediation, in which plants grown in the composted dredged material degrade contaminants, hold some promise for PAH degradation.) Costs associated with composting are estimated upwards of $20 per cubic yard. However, these costs can be offset by the sale of the final product at approximately $5-$10 per cubic yard.

3) Solidification/Stabilization

Sediment solidification/stabilization is a simple method to treat contaminated sediments by the addition of cement, fly ash, lime and/or chemicals to create soil aggregates. Dredged material is mixed with cement and other additives to bind the small particles into larger aggregates with improved physical and chemical properties that qualify the treated sediment for use as aggregate in some types of construction processes. The end product can be used in landfill closure and brownfield remediation projects. The process has used sediment from both freshwater and marine environments. This technology process has

been used following solvent extraction procedures described under "soil washing" above and is estimated to cost $30-$60 per cubic yard.

4) Thermal Desorption

Thermal desorption involves heat to remove the organic compounds in moderately to highly contaminated dredged material. The process takes place in a rotary kiln. The rotary kiln is a tube that is rotated to mix the sediment while the temperature is elevated. The level of decontamination depends on the temperature and amount of time the sediment remains in the kiln. Temperatures around 500°C have shown not to be high enough to entirely eliminate all organic compounds and most metals, while temperatures around 1400°C have been shown to completely destroy all organic compounds. Metals are volatized, raising cross-media pollution concerns and, as a result, this technology requires comprehensive air permits. Thermal desorption at the lower temperature produced a waste stream of hazardous material as a side product that would require disposal at a hazardous waste treatment facility. At higher temperatures, the remaining metals were locked into the melted matrix. Thermal desorption production costs have been estimated at ranges between $50 per cubic yard to $50 per ton. The higher temperature demonstration has been conducted in existing cement plants with an associated "Cement-Lock" technology. Cement-Lock technology, developed by the Gas Technology Institute, can utilize any type of dredged material. The ability of existing cement plants to handle large volumes of dredged material may reduce overall costs. The end result is construction-grade cement.

5) Base Catalyzed Decomposition (BCD)

BCD is a variation of thermal desorption developed by the Batelle Company. BCD involves a two-stage process for removing halogenated compounds (e.g., dioxins, furans and PCBs). In the first stage, sediment is mixed with sodium bicarbonate and heated to 340°C. This vaporizes and partially decomposes the contaminants. The vaporized contaminants are dehalogenated using heat, sodium hydroxide and a catalyst in the second stage. The volatile and semi-volatile organic compounds present in the contaminated dredged material also are removed by the heat treatment, as are inorganic compounds with high vapor pressure or solubility. The removal/destruction efficiency of the thermal desorption process in handling chlorinated compounds was 99.8 percent in the demonstration project. PAHs could not be removed or decomposed using the BCD process. Metals that remained after treatment were not found to be leachable by standard leachate testing, and the final product was not considered a hazardous waste. Sidestream wastes (e.g., water, volatile and semi-volatile organic compounds, and volatile metals) require a complex material and pollution handling system to minimize environmental emissions. Batelle estimated the cost of dredged material decontamination at a BCD facility treating 150,000 cubic yards per year at $108 per cubic yard.

6) Fluidized Bed Treatment

BioSafe Corp. has developed a fluidized bed treatment (FBT) cracking technology that completely destroys organic compounds in dredged material using a high-temperature heating unit. This technology is not an incineration or oxidation process; it converts all organic materials to carbon monoxide, hydrogen and methane. The remaining solids are free of organic contaminants and, depending on the metal content, can be used without restriction. The advantage of this technology is that it can operate with a continuous feed of material and can use the material without dewatering. It produces a product free of organic contaminants with 99.9 percent efficiency. Beneficial uses for the treated end product are clean fill, concrete aggregate, cover material and agricultural material. The disadvantages of this process are that it is extremely energy intensive and costly. Despite promising results in pilot studies, the BioSafe Corp. has discontinued research into FBT technology. Production costs were estimated by BioSafe at $40-$120 per cubic yard.

7) Gas Phase Chemical Reduction

Ecologic has developed a Gas-Phase Chemical Reduction (GPCR) technology which also uses a non-oxygenated process to break down organic contaminants into inert components. For example, heat and hydrogen are used to break down PCBs into methane and hyrdogen chloride. Sediments much be in a liquid or gas phase to use the technology. For dredged material, this requires an additional technology to separate the liquids from the solids. A TORBED reactor system technology has been developed, which uses heat and high velocity jets to desorb sediments contaminated with organic compounds from granular particles (thermal desorption). This transforms the contaminated material into a gas phase and renders it suitable for the GPCR technology. To date, the two technologies have not been combined, so the ability to deal with materials in a solid/liquid phase, like dredged material, remains uncertain.

8) Vitrification

Vitrification is the process of converting sediment into glass aggregate. Westinghouse Energy Company demonstrated a plasma vitrification process that destroyed organic contaminants at 99.99 percent efficiencies and immobilized metals to form a glass matrix using a high-temperature plasma torch. The plasma torch is an effective method for heating sediments to temperatures that are higher than can be achieved in rotary kilns (thermal desorption). Plasma temperatures can reach 3000°C at which the sediment is melted using fluxes to produce a glass product. The molten glass can be quenched to produce a glass aggregate or directly fed to glass manufacturing equipment to produce a salable product. The pilot plant operated at a rate of 100,000 cubic yards per year and it was estimated that a full-scale plant could operate at a rate of 380,000 cubic yards per year. Preliminary costs for sediment processing ranged between $90 and $120 per cubic yard. This glass product can be resold to recover some costs associated with the process.

A glass furnace technology developed by Minergy Corporation will be tested in Wisconsin in a pilot project for the treatment of approximately 70 tons of PCB-contaminated material from the Fox River. The technology uses an oxy-fueled glass furnace, which has relatively low energy requirements. The pilot scale technology will operate for two weeks in 2001 and will provide the necessary operational data to scale up to a full-scale melter. The pilot project will evaluate the ability of the technology to destroy contaminants and produce a usable end product (glass aggregate). Preliminary testing results indicate that the glass furnace capital and operating costs could allow the processing and melting of sediments to be considered an economically viable option. However, the technology will require sediments to be relatively dry (greater than 90 percent solids) prior to loading into the melter, and mechanically dewatered sediments can only be expected to contain about 50 percent solids. Additional phases of the pilot project include a review of appropriate drying technology and testing of the preferred drying technology to verify contaminant fate. The pilot project is a cooperative effort among the U.S. EPA-Great Lakes National Program Office, the U.S. EPA Superfund Innovative Technology Evaluation (SITE) program, Wisconsin DNR and the Minergy Corporation.

9) Electrochemical Remediation

Electrochemical remediation technologies include electrochemical geo-oxidation (ECGO) and induced complexation (IC). These technologies work by placing electrodes into the sediment where a low power DC/AC field is imposed, using the sediment to store and discharge electricity. Through polarization, ECGO breaks down organic contaminants into inert component parts and IC enhances mobilization of metals to the electrodes. Electrochemical remediation technologies have had broader receptivity in Europe than in the United States., but Weiss Associates and other private companies are trying to broaden their U.S. application. Advantages appear to be that this technology requires no pumping or adding of chemicals. Disadvantages are that it is not well-tested in the United States, it is about 30 percent more costly for aquatic sediments than for dry material, and the electrodes can only extend to a depth of approximately 30 feet.

VI. State Regulatory Profiles for Beneficial Use of Dredged Material

Illinois

Beneficial Use Definition

Illinois state regulations do not define beneficial use of dredged material. The state uses the Corps' definition: "Utilizing dredged sediments as resource materials in productive ways."

Water Quality Regulations

In all states except Michigan, §404 of the Clean Water Act designates the Corps as the lead agency for dredging permitting responsibilities. Section 404 applies to the disposal of dredged material into lakes, rivers and wetlands. It also applies to any "return water," or effluent, from upland disposal of dredged material. Accordingly, §404 does not apply specifically to the placement of dredged material at upland sites, only the effluent from these sites. Section 401 provides all of the states the authority to issue certification that proposed dredge and fill disposal activities will not violate applicable state water quality standards. A §401 certification is required for any discharge regulated under §404 that is not regulated under another program (e.g., NPDES). The §401 certification is not a permit, but its denial has the same effect as a negative permit determination, in that the Corps will not issue a §404 permit if a §401 certification is denied. State water quality regulations [35 IL Adm. Code, Subtitle C, Ch. II, Part 395] govern beneficial use of dredged material. The Illinois Environmental Protection Agency's (ILEPA) Bureau of Water has responsibility for implementing these regulations.

Other Applicable Regulations

Section 39 of the Illinois Environmental Protection Act has some jurisdiction over certain beneficial use projects.

Contaminant Criteria

Illinois has no contaminant criteria for projects that involve the beneficial use of dredged material.

Regulatory Process

Where beneficial use projects are part of a dredging project, the applicant submits a §404 permit application jointly to the Corps, Illinois DNR (ILDNR) and ILEPA. The permit specifies the dredging and disposal method and location of disposal.

If beach/littoral nourishment is proposed a determination is made as to the material's suitability for such use (35 IL Admin Code Subtitle C, Chap II, Part 395-July 17, 1981). However, each project is evaluated on a case-by-case basis; sediments are analyzed for contaminant levels and a determination is made based upon the quality of the dredged material and the proposed environment in which it would be applied.

The ILEPA has written procedures and criteria regarding beach/littoral nourishment (see below). 35 IL Admin Code Subtitle C, Chap II, Part 395-July 17, 1981 contains those procedures for analysis of particle size, elutriate and supernatant if the material is greater than 20 percent fine (greater than 20 percent passing a #230 US Standard sieve). Additional contaminant testing can be done and is based on sediment data from verified sources (i.e., ILEPA or other state/federal agencies). For beach nourishment projects, the ILEPA will evaluate the benefits of beach nourishment against the potential water quality impacts, with beach nourishment projects only occurring when benefits outweigh impacts. Sediment testing for contaminants, such as PCBs and asbestos are required by ILEPA, and coordination of contaminant testing results with ILEPA Bureau of Land and the Illinois Department of Public Health may be necessary.

There are several Illinois harbors that require maintenance dredging to keep navigational channels open, such as Waukegan Harbor, North Point Marina, Wilmette Harbor and several Chicago park district harbors. As stated above, if dredged material is to be used for beach/littoral nourishment, material is tested in accordance with 35 IL Admin Code Subtitle C, Chap II, Part 395-July 17, 1981 to verify that the material is predominantly sand. After evaluation of the sediment analysis, permits can be issued under §39 of the Environmental Protection Act and §401 of the Clean Water Act. For most dredging projects, material is clamshelled onto a barge and offloaded downdrift of the harbor.

Project Monitoring

There is no state monitoring of beneficial use projects, nor does the state have any regulatory authority for such activity.

DMMPs

The state role in DMMPs is unclear. A DMMP is currently being developed for a Corps project for dredging in Waukegan Harbor, with the Chicago District of the Corps as the lead agency and local contacts in the Waukegan Port District.

Indiana

Beneficial Use Definition

The term "beneficial use" is used generally by Indiana Department of Environmental Management (IDEM) with respect to wetlands' use classification (per U.S. EPA guidance from the Clean Water Act), and land application of biosolids and industrial waste as per state regulation 327 IAC 6.1-2-6. There is no state regulatory definition of beneficial use of dredged material. State agency personnel refer to the definition of beneficial use of dredged material provided by §204 of WRDA 1992: "The protection, restoration and creation of aquatic and ecologically related habitats, including wetlands, in connection with dredging for construction, operation or maintenance by the Secretary of an authorized navigation project."

Water Quality Regulations

In all states except Michigan, §404 of the Clean Water Act designates the Corps as the lead agency for dredging permitting responsibilities. Section 404 applies to the disposal of dredged material into lakes, rivers and wetlands. It also applies to any "return water," or effluent, from upland disposal of dredged material. Accordingly, §404 does not apply specifically to the placement of dredged material at upland sites, only the effluent from these sites. Section 401 provides all of the states the authority to issue certification that proposed dredge and fill disposal activities will not violate applicable state water quality standards. A §401 certification is required for any discharge regulated under §404 that is not regulated under another program (e.g., NPDES). The §401 certification is not a permit, but its denial has the same effect as a negative permit determination, in that the Corps will not issue a §404 permit if a §401 certification is denied. If effluent from an upland beneficial use project is sent to a public owned treatment works (POTW) or if a site-specific wastewater treatment system is used (and permitted under §402), then no §401 certification is required. A beneficial use project can be part of a §404 permit and could also be a stand-alone project since it is not a requirement of the §404 process.

Other Applicable Regulations

Indiana does not have regulations specific to the beneficial use of dredged material. If dredged material is determined to be contaminated, it is regulated as a solid waste under Indiana's solid waste rules [Chapter 329 of the Indiana Administrative Code (IAC) 10-2-17(a)(6)(B)]. These regulations require contaminated sediments to be disposed of in a permitted solid waste facility (e.g., landfill).

If dredged material is not contaminated, it is not regulated as a solid waste and state water quality regulations [327 IAC 2-1 and 327 IAC 2-1.5] and associated risk assessment procedures will govern the appropriate in-water beneficial uses. In-water beneficial use projects require a §404 permit from the

Corps and a "construction in a floodway" permit from the Indiana Department of Natural Resources (IDNR). After obtaining the proper permits, the material must not contain contaminants in order to be used for in-water beneficial use projects.

As of May, 2000, state water quality regulations allow only uncontaminated dredged material to be beneficially used. State guidance under development has the potential to provide an additional means to allow beneficial use of dredged material that is separate from §404 dredge and fill activities. The guidance is expected to identify specific levels of contaminants that can remain in dredged material and still allow it to be used beneficially. The guidance will apply to both upland and in-water beneficial use and will not necessarily be tied to the state §401 water quality program (but will have overlapping requirements from the solid waste program).

Contaminant Criteria

If dredged material is a listed hazardous waste or exhibits a hazardous waste characteristic, then it is not eligible for beneficial use and must be disposed of at a permitted hazardous waste treatment or disposal facility. Indiana does not have specific contaminant criteria for dredged material used for in-water beneficial use projects. For upland beneficial use projects, dredged material must meet soil contaminant criteria which are not codified. As stated above, if dredged material is not contaminated, it can be used for beach nourishment or other beneficial uses.

Beneficial use of dredged material is guided by analytic test results of dredged material obtained prior to dredging. If the material has levels of contaminant constituents that are less than the residential values published in the Risk-Integrated System of Closure (RISC) guidance, then the material is not contaminated. These values allow some contaminants to be present in the material, however, if material exceeds the RISC residential values it is considered contaminated, and therefore a solid waste and not appropriate for beneficial use. For instance, if the material is not contaminated, and is aesthetically comparable, it may be used for beach nourishment. For material that contains constituents (i.e., contaminants), it must be demonstrated that the material poses no unacceptable threat to human health or the environment prior to being used for beach nourishment or other beneficial use. Since the use of RISC levels are based on groundwater protection, no impact on groundwater is possible. Dredged material that contains higher levels of constituents can be used for upland projects, such as berms, road beds or fill material, though it is unclear how such projects are evaluated and/or receive IDEM approval. Contaminant exposure pathways, depth to groundwater and land-use restrictions complicate the process. Dredged material that contains constituents also may be used for beach nourishment provided that the material is analyzed and results indicate that there is no threat to human health or the environment.

Regulatory Process

Presently, beneficial use projects in Indiana are initiated only by the parties doing the dredging as part of a dredge and fill permit under §404 of the Clean Water Act. To date, this has primarily been the Corps. There is no regulatory process in place to evaluate beneficial use projects that are not part of §404 dredging activities (e.g., CDF mining). The Corps, as with any entity in charge of a project, will conduct its own analysis of dredged material and present the results to IDEM for review and consideration for beneficial use.

Project Monitoring

Presently, Indiana does not conduct post-project monitoring for beneficial use of dredged material.

DMMPs

The state role in DMMPs is unclear. The only DMMP in Indiana presently is from a Corps project for dredging in the Indiana Harbor Ship Canal, with the Chicago District of the Corps as the lead agency and local contacts in the East Chicago Waterway Management District. The dredged material from this

project is heavily contaminated and, therefore, would not qualify for beneficial use projects. Since no other DMMP exists in Indiana, it is impossible to assess how the process (in relation to beneficial use) could be improved.

STATE NOTES

Beneficial use of dredged material in Indiana has primarily been for beach nourishment. However, low lake levels are prompting consideration of other types of beneficial uses of dredged material to accommodate the anticipated increase in quantities of dredged material. IDEM's Section 401 is taking the lead on this initiative.

MICHIGAN

BENEFICIAL USE DEFINITION

Michigan does not use any federal or state determined definition for beneficial use of dredged material. Generally, activities that have a legitimate beneficial use are considered beneficial use by the Michigan Department of Environmental Quality (DEQ). Area enhancement is beneficial in that placement of the sediments enhances the land in some way, such as construction fill or soil conditioning of agricultural land.

WATER QUALITY REGULATIONS

Michigan is the only Great Lakes state that has authority to issue dredge and fill permits under §404 of the Clean Water Act. However, that authority is limited to certain interior waters of the state and does not apply to Great Lakes dredging. Section 404 applies to the disposal of dredged material into lakes, rivers and wetlands. It also applies to any "return water," or effluent, from upland disposal of dredged material. Accordingly, §404 does not apply specifically to the placement of dredged material at upland sites, only the effluent from these sites. Section 401 provides all of the states the authority to issue certification that proposed dredge and fill disposal activities will not violate applicable state water quality standards. A §401 certification is required for any discharge regulated under §404 that is not regulated under another program (e.g., NPDES). The §401 certification is not a permit, but its denial has the same effect as a negative permit determination, in that the Corps will not issue a §404 permit if a §401 certification is denied.

OTHER APPLICABLE REGULATIONS

Prior to evaluating a proposed use of dredged material, the DEQ determines if the dredging is to be permitted. If beneficial use is conducted as part of dredge and fill activities, the type of regulations that apply and associated permits depend upon where the activity takes place. In addition to §404 permits and §401 certification, dredging and filling activities also can require specialized permits, such as a submerged lands, inland lakes and streams, shorelands, or wetlands permits.

The regulations generally considered for upland beneficial use application are Michigan's Part 111 (Hazardous Waste Management) and Part 115 (Solid Waste Management) of PA 451, the Natural Resources and Environmental Protection Act of 1994. Part 111 and Part 115 are both used to evaluate upland placement of sediments. Part 111 is used to determine if the material is a hazardous waste. If the material is hazardous, it is subject to Part 111 and the proposed beneficial use may not be allowed. If the material is not hazardous, it then becomes subject to Part 115 requirements and placement outside of a landfill may be approved. Dredged material is considered a solid waste under Part 115 if the material contains contaminants above the state's inert criteria. The Part 115 administrative rules do not require that the use of dredged material have a beneficial use although staff encourage such use. These rules are used to evaluate the dredged material and determine the appropriate disposal management options.

For in-water beneficial use projects, Part 111 is also used to determine whether the dredged material is considered bo be a regulated hazardous waste. If sediments are determined to be a hazardous waste,

they must be disposed of in a licensed hazardous waste landfill and the Surface Water Quality Division (SWQD) will not allow in-water placement of the material. Section 401 water quality criteria and Part 31 (Water Resources Protection) regulations also are used to assist in evaluating in-water disposal/placement options.

At this time, Michigan does not apply sewage sludge standards/regulations to dredged material as the technical adequacy of the standards have not been shown to be applicable to dredged sediments. Michigan's regulations allow use of dredged material when remediation and application to brownfields is involved.

Contaminant Criteria

If the dredged material is a regulated hazardous waste, it must be "properly managed" (i.e., placed in properly licensed hazardous waste treatment, storage and disposal facilities) according to Part 111 and federal hazardous waste regulations. All dredged material must be evaluated pursuant to Part 111 to determine if it is a regulated hazardous waste, but beneficial uses can be considered under Part 115 for some contaminated dredged material where such uses limit certain routes of exposure. Rules 4111-4119 of Part 115 contain the references for the contaminant criteria that must be met for upland placement outside of a landfill. The DEQ Waste Management Division is in charge of implementing Part 115.

The state contaminant criteria contained in Part 115 are based on standards established under the State Environmental Response Program (Part 201), using a risk-based process for all contaminated media, including dredging projects. This risk-based process takes into account all applicable exposure pathways. The allowable end use depends on the exposure pathways and which state contaminant criteria are met. Also, the allowable end use can vary depending on the proposed management. For example, an end use that exceeds standards for direct contact only may be allowed if there is clean cover and a deed restriction.

Regulatory Process

When a beneficial use is proposed as part of a §404 dredging permit, the approval process is as follows: the applicant submits application to the DEQ Land and Water Management Division (LWMD). The LWMD distributes to DEQ Waste Management Division (WMD), SWQD, and other appropriate divisions and agencies that may have programs impacted by the proposal. LWMD coordinates submittal of comments and concerns identified for the applicant to address. The proposed use of dredged material determines which program within the DEQ would make the determination that the use is acceptable. Open and in-water uses are usually the greatest concern to the SWQD's Great Lakes Program, while upland placement would fall under the purview of the WMD's Solid Waste Program. If a proposal involves both in-water and upland uses, the SWQD and WMD coordinate their reviews. If one division finds the beneficial use proposal acceptable while the other does not, it is the responsibility of the applicant to resolve those concerns before being authorized by both divisions.

Upland Management

Applications submitted should have analytical contaminant data on a representative number of samples and a description of the proposed disposal/use location. If the analytical data indicate they meet acceptable contaminant levels per state law (Part 111 and Part 115) for upland use, the use is authorized by Rule 110 of Part 115. If the dredged material meets Part 115 inert standards, the material is not subject to regulation and can be used in any manner that does not violate any other state or federal law. If the sediments data indicate contaminant levels have been exceeded, staff may encourage beneficial use and authorization can still be granted for upland disposal at a specific site, which means it can only be disposed/used in a manner that will minimize routes of exposure such as direct contact (e.g., requires deed restriction and clean cover). The WMD conducts the review of upland proposals.

DEQ also allows small quantities (less than 1,000 cubic yards) of dredged material, though not from Areas of Concern, to be placed on site in an upland project without contaminant testing. Also, no testing is required if the material is less than 1,000 cubic yards, not from an Area of Concern and has contaminant testing data less than 10 years old that show the sediments are not contaminated. This material can then be placed on site with clean cover and a deed restriction.

In-water Management

The SWQD reviews open and in-water dredged material disposal options. If the beneficial use proposal is acceptable, SWQD issues the §401 certification. SWQD primarily reviews Corps open water disposal or beach nourishment proposals. Most others are presumed to meet the §401 certification unless they are from Areas of Concern due to contaminant concentrations. Generally, if 95 percent of the material is sand, a beach nourishment project would be approved.

Project Monitoring

After beneficial use projects are completed in Michigan, the DEQ's LWMD, SWQD and WMD may have monitoring authority, although monitoring does not generally occur due to lack of resources.

DMMPs

About 40 DMMPs have been completed to date for Michigan's federal harbors and channels. These range in scope from simple assessments to full plans with alternative evaluations and environmental documentation. Four DMMPs are currently underway. Virtually every federal navigation project in Michigan that requires maintenance dredging will eventually have a plan. The DEQ is given the opportunity to review draft DMMPs and staff may suggest a beneficial use project. The Corps Detroit District office is the lead agency.

State Notes

Examples of beneficial use projects in Michigan include agricultural and silvicultural uses of wastes/soils as nutrient sources or soil amendments (including composting mix for soil conditioners), beach nourishment and construction fill material. At this time, the state also is exploring the use of contaminated sediments from the Detroit River as brick material for construction purposes. As a practice, the state encourages applicants to consider beneficial use projects that are the least disruptive alternatives and are also ecologically sound. For local sponsors of beneficial use activities, expense is often a major factor in the decisionmaking process.

The state indicates a preference for beneficial use, including beach nourishment, over disposal of dredged material. The state implements this preference through the permit review process by trying to encourage the Corps or local sponsors to use a beneficial option. The state does not have any authority to require dredging projects to be beneficial.

Beach nourishment is the most common form of beneficial use of dredged material in Michigan. However, slightly contaminated dredged material has been used as daily landfill cover. Clean material not suitable for beach nourishment (i.e., silts and clays) can be used for construction fill for projects that do not involve filling wetlands or floodplains.

Minnesota

Beneficial Use Definition

Minnesota uses a definition from the Minnesota Pollution Control Agency's (MPCA) Dredge Permit for beneficial use of dredged material: " Beneficial reuse means the re-use of dredged material, after the material has been dewatered, in projects such as, but not limited to: road base, building base or pad, etc."

"Public benefit" and the determination of public benefit is applied to in-water beneficial use projects. The public benefit of in-water beneficial use can be found in Part 6115.0200, Excavation of Protected Waters, Subpart 5, Item B(2)(d):

> *Redisposition of excavated materials, consisting of inorganic materials free from pollutants, into protected waters shall only be permitted when it will result in improvement of natural conditions of protected waters for the public benefit and will not result in sedimentation, obstruction of navigation, or a loss of fish or wildlife habitat.*
>
> *Determination of the public benefit served by redisposition of excavated materials shall be based on the value to the public of redeposited materials in order to protect shorelines from the damaging effects of erosion due to winds and waves when there are not other feasible, practical, and ecologically acceptable means to protect the shoreline; or create or improve habitat areas for fish and wildlife; or mitigate or enhance the physical and biological environment within protected waters when mitigative or enhancement measures are required as a condition of a permitted activity within the waters involved and there are no other feasible, practical, and ecologically acceptable mitigative measures.*

Beneficial use also includes upland projects in Minnesota. The most acceptable upland beneficial use projects incorporate the following means of placement:

- complete removal of excavated materials from the waters and disposal and reuse for other purposes outside of the floodplain
- deposition in stable on-land disposal sites located above the ordinary high water mark and outside of floodway districts established under local ordinance (provisions must be included for properly stabilizing these materials)
- temporary deposition along shorelines or within floodplains by stockpiling materials for subsequent removal to areas outside of any protected waters and outside of established floodplain districts provided that: any stockpile materials are removed within one year of stockpiling and the stockpile is constructed so that any materials or waters entering or leaving the stockpile are controlled to prevent any introduction of sediment into the environment surrounding the stockpile.

Minnesota is currently evaluating the following types of beneficial use of dredged material:

- Habitat enhancement/restoration/creation
- Beach nourishment
- Construction fill
- Revegetation/reclamation of mineland/gravel pits/tailings
- Capping/containment of contaminated sediments
- Harbor pier improvement

Water Quality Regulations

In all states except Michigan, §404 of the Clean Water Act designates the Corps as the lead agency for dredging permitting responsibilities. Section 404 applies to the disposal of dredged material into lakes, rivers and wetlands. It also applies to any "return water," or effluent, from upland disposal of dredged material. Accordingly, §404 does not apply specifically to the placement of dredged material at upland sites, only the effluent from these sites. Section 401 provides all of the states the authority to issue certification that proposed dredge and fill disposal activities will not violate applicable state water quality standards. A §401 certification is required for any discharge regulated under §404 that is not regulated under another program (e.g., NPDES). The §401 certification is not a permit, but its denial has the same effect as a negative permit determination, in that the Corps will not issue a §404 permit if a §401 certification is denied.

Other Applicable Regulations

Applicable regulations can be found in Chapter 4 and Appendices G and H of Minnesota Department of Natural Resources' (MNDNR) Lake Superior's Coastal Program document. These rules include state environmental review regulations water quality regulations, and public water regulations. In addition, the MPCA has rules that govern the placement of dredged material and, as noted above, is responsible for implementation of §401, pursuant to the Clean Water Act.

In-Water Management

MNDNR's rules and regulations cited in Lake Superior's Coastal Program document are not specific to beneficial use. These rules guide decisions on in-water beneficial use projects that result in filling or excavation that are performed below the Ordinary High Water Level (OHWL) for waterways. For example, a habitat enhancement project that incorporates dredged material placement in public waters would have to comply with the standards and criteria set in Minnesota rules for both DNR and MPCA-administered programs. Beneficial use projects that affect adjacent coastal state territorial waters require compliance with Section 307 of the Coastal Zone Management Act. Federal consistency depending on the beneficial use activity being proposed and different regulations, programs or permits may or may not apply.

Contaminant Criteria

The MPCA sets levels of acceptable contaminants for its §401 water quality standards and is currently in the process of developing sediment quality guidelines. These guidelines will be used to determine if the dredged material is contaminated. Currently, the Ontario Ministry of the Environment's Sediment Guidelines provide a starting point in evaluating the potential for adverse impacts of dredged material in a beneficial use proposal.

Regulatory Process

Because beneficial use of dredged material is mentioned in the MPCA's State Disposal System Permit for dredged material disposal, agency staff discuss the feasibility of beneficial use with permit applicants on a case-by-case basis, applying the regulations noted above as appropriate.

Project Monitoring

Monitoring is cooperative among the local project sponsor and state and/or local regulatory agencies. If the Corps is the federal project sponsor, the state will encourage the Corps to participate in short-term monitoring during both planning and implementation. The MNDNR and MPCA have monitoring requirements to be met and both field staff and funding for monitoring beneficial use projects.

DMMPs

The DMMP planning process is used in the Duluth/Superior Harbor to identify and coordinate potential beneficial use projects with a large group of interested private and governmental agencies and organizations. The Harbor Technical Advisory Committee (HTAC) of the Metropolitan Interstate Committee (MIC) is the organization through which all beneficial use and DMMP planning is coordinated.

State Notes

Beneficial use projects have been and are occurring in Minnesota. Island creation has occurred in the Duluth/Superior Harbor. Barkers Island Recreation Area, and Interstate Island (MN/WI) and Hearding Island wildlife management areas have been constructed by placement of dredged material. Beach nourishment has occurred on Wisconsin Point and along Minnesota Point, and plans call for continued application of dredged material for beach nourishment. Studies have been initiated by the Corps for two habitat enhancement projects: the 21st Avenue West Project and the Hearding Island Deep Hole Habitat Enhancement Project.

Regarding the use of dredged material from Erie Pier CDF, two studies have been initiated. One study will assess the ability to separate materials, using a hydrocyclone, for use in beneficial use projects while another study will determine the economic and physical viability of utilizing CDF materials in reclamation of mineland. Also currently under evaluation is a proposal to utilize dredged material for capping contaminated sediments at two Superfund sites in the St. Louis River Estuary/Harbor.

NEW YORK

Regulation of dredged material in New York can be divided into two distinct categories: upland management and in-water/riparian management.

BENEFICIAL USE DEFINITION

New York does not have a regulatory definition of beneficial use of dredged material.

For upland management, Part 360 (State Solid Waste Facility Regulations) of Title 6 of the New York Official Compilation of Codes, Rules and Regulations (6 NYCRR) State Solid Waste Facility Regulations establishes criteria used by the state to determine whether a proposed use of a dredged material (and other solid wastes) is considered a "beneficial use."

Under Part 360, a beneficial use must constitute a reuse rather than disposal. It also must be consistent with New York State Solid Waste Management Policy to reduce, reuse, recover energy and landfill, in that order. The material must serve as an effective substitute for an analogous raw material, whether used in a manufacturing process or as a direct commercial product. There must be demonstrated markets for the material/product. Finally, the beneficial use must not adversely affect human health and safety, the environment or natural resources. The general concepts of Part 360 also apply to the in-water/riparian management definition of beneficial use.

WATER QUALITY REGULATIONS

In all states except Michigan, §404 of the Clean Water Act designates the Corps as the lead agency for dredging permitting responsibilities. Section 404 applies to the disposal of dredged material into lakes, rivers and wetlands. It also applies to any "return water," or effluent, from upland disposal of dredged material. Accordingly, §404 does not apply specifically to the placement of dredged material at upland sites, only the effluent from these sites. Section 401 provides all of the states the authority to issue certification that proposed dredge and fill disposal activities will not violate applicable state water quality standards. A §401 certification is required for any discharge regulated under §404 that is not regulated under another program (e.g., NPDES). The §401 certification is not a permit, but its denial has the same effect as a negative permit determination, in that the Corps will not issue a §404 permit if a §401 certification is denied.

In New York, §401 certification is needed for all dredging and in-water/riparian beneficial use projects. A Beneficial Use Determination (BUD), as described below, is only necessary for dredged material that is proposed to be beneficially used upland. For a dredging application to be deemed complete under a §401 certification, the New York State Department of Environmental Conservation (NYSDEC) normally requires an applicant to designate a disposal site, or an end use of the material, whether in-water/riparian or upland. The end use is designated and approved in either the §401 or an Article 15 permit, since the Corps issues the §404 permit in New York.

OTHER APPLICABLE REGULATIONS

Upland Management

Part 360 Solid Waste Facility regulations govern waste material that is to be beneficially used. These regulations consider a broad array of solid "wastes" for beneficial use, not just dredged material. Part 360 is used by the NYSDEC to determine whether a proposed use of dredged material is in fact a beneficial use. If a proposed use of dredged material meets the criteria for beneficial use of a

solid waste as set forth in Part 360-1.15, a Beneficial Use Determination (BUD) may be granted, at which point the waste material (i.e., dredged material) ceases to be considered a solid waste (for purposes of Part 360). This applies to both predetermined BUDs (see below) and case-specific BUDs. BUDs differ significantly from permits and are not subject to Part 617 State Environmental Quality Review or Part 621 Uniform Procedures Act requirements.

A 360 permit is a permit issued by NYSDEC under the 6NYCRR Part 360 Solid Waste Management Facilities regulations. Generally, a Part 360 permit is required whenever a solid waste is to be processed, treated or transferred and when a solid waste is to be stored for an extended period of time.

A common scenario for dredged material is that the use may be specified in the BUD, but the material still needs to be physically pre-processed (e.g., dewatered, stabilized), stored or transferred prior to being used. Unless the pre-processing operations can be performed at a location adjacent to the dredging location and administered under the dredging permit, the material management location is considered upland, the material is a solid waste and the operations are subject to Part 360 requirements. Long-term operations would require a Part 360 solid waste management facility permit. Short term operation for the purposes of the pilot and demonstration phases of the project could be covered under a Research, Development and Demonstration (RD&D) permit (described on next page). During the transfer process, dredged material is specifically exempted from New York's waste transporter requirements (Part 364). Therefore, no transporter permit is required. However, if the material must be transferred between vehicles (i.e., barge to truck, rail to truck, etc.), a part 360 Transfer Station permit may be required.

The "cessation of solid waste regulation" that is provided by a BUD does not occur until the material is used as specified in the BUD. Until that usage occurs, the material is still a solid waste and management of the material may require Part 360 permits. This concept is a basic tenant of New York's beneficial use program. It is a necessary measure to prevent abuse of the program by those whose projects and motives are not truly for beneficial use, but rather avoidance of permitting requirements.

Part 360 -1.15(b) establishes 16 pre-determined BUDs, four of which are potentially applicable to dredged material. They include:

- 360-1.15(b)(7) - uncontaminated soil, which has been excavated as part of a construction project, and which is being used as a fill material, in place of soil native to the site of disposition;
- 360-1.15(b)(8) - nonhazardous, contaminated soil, which has been excavated as part of a construction project, other than a department-approved or undertaken inactive hazardous waste disposal site remediation program, and which is used as backfill for the same excavation or excavations containing similar contaminants at the same site;
- 360-1.15(b)(10) - solid wastes, which are approved in advance in writing by the department for use as daily cover material or other landfill liner for final cover system components; and
- 360-1.15(b)(11) - recognizable, uncontaminated concrete and concrete products, asphalt pavement, brick, glass, soil and rock when placed in commerce for service as a substitute for conventional aggregate.

Unless otherwise stated in the BUD language, no additional NYSDEC authorizations are legally required when the material is used as specified, and the BUD is "self-implementing." Of the four pre-determined BUDs potentially applicable to dredged material, three [360-1.15(b) (7,8, and 11)] fit into this category. The BUD [360-1.15(b) (10)] that is not self-implementing specifically states that written NYSDEC approval is required. Although no additional NYSDEC authorization is legally

required, many users of material feel more comfortable obtaining a written determination from NYSDEC stating that their proposed material use meets the requirements of the predetermined BUD. Also, given the often controversial nature of dredged material management projects, NYSDEC encourages potential users to consult with NYSDEC if there is any doubt that the proposed use meets the requirements of the predetermined BUD. Where a proposed beneficial use project does not fit into one of the pre-determined scenarios outlined above, Part 360-1.15(d) provides guidance to evaluate beneficial use project proposals and grant BUDs on a case-specific basis. In addition to pre-determined and case-specific BUDs, proposed beneficial use projects may be evaluated as an RD&D project under Part 360-1.13. This regulation is deliberately flexible to encourage innovation in beneficial use.

Depending on the type of proposed application, beneficial use projects may also require consideration of other state regulatory frameworks, such as water and fish and wildlife program regulations. Projects that will mingle beneficial use of dredged material with other regulated activities such as RCRA facilities, brownfields and hazardous waste sites, must be consistent with the relevant regulations for those activities.

In-Water/Riparian Management

The NYSDEC Division of Water's *Interim Guidance Freshwater Navigational Dredging* (October 1994), currently undergoing revision/update, is used during the project evaluation process for in-water/riparian application of dredged material.

For beach nourishment projects, CZMA regulations, and potentially §10 of the Rivers and Harbors Act, are considered. For habitat/wetland creation/enhancement projects, §204 of WRDA is considered.

CONTAMINANT CRITERIA

Generally, dredged material that meets state criteria for hazardous waste is not considered appropriate for beneficial use projects.

Upland Management

New York state does not have specific contaminant criteria for dredged material that is beneficially used under its upland management program. When possible, the state looks to potentially applicable non-state criteria and/or state guidance and standards, which have been established for other programs.

In-Water/Riparian Management

No state sediment quality regulations exist for in-water/riparian management. Class A material limits as described in the *Interim Guidance for Freshwater Navigational Dredging* (October 1994) help establish that these materials may be used for in-water/riparian beneficial use projects in an unrestricted manner. Class B and Class C sediments are not restricted from in-water management, but there are more restrictions on the management options. For example, capping of Class B material is allowed, while Class C materials in riparian areas must be lined and capped. The limits described in the *Interim Guidance for Freshwater Navigational Dredging* (October 1994) were derived based on Long and Morgan and Persaud values for acute/chronic toxicity.

REGULATORY PROCESS

Upland Management

A generator or potential user must contact the NYSDEC Division of Solid Waste and Hazardous Materials to seek a BUD for dredged material. NYSDEC Division of Solid Waste and Hazardous Materials staff will grant a BUD if the proposed use conforms to one of the four pre-determined BUDs which are potentially applicable to dredged material. In certain circumstances a generator or

potential user will have to apply to the NYSDEC Division of Solid Waste and Hazardous Materials for a 360 permit.

Where a proposed reuse does not fall under one of the four pre-determined BUDs for dredged material, generators and potential users can petition the NYSDEC Division of Solid Waste and Hazardous Materials for a case-specific BUD. A case-specific petition must include all the information required by paragraph 360-1.15(d)(1). NYSDEC will review the petition and if the proposed use meets all criteria outlined in §1.15(d) a case-specific BUD may be granted. If insufficient information exists to evaluate a case-specific BUD petition, the proposed project may be evaluated as a Research, Development and Demonstration (RD&D) project. Part 360-1.13 establishes criteria for obtaining a RD&D project. Requirements for RD&D projects are intentionally very flexible to encourage the development of innovative technologies and processes. RD&D permits are utilized when not enough information exists to allow the material to exit regulation as a solid waste. The material in this case remains a solid waste, which is regulated under the RD&D permit. If the RD&D project is successful in demonstrating that a BUD is appropriate, the BUD, when granted, may be written to cover the materials used under the RD&D as well as future beneficial use. The pilot, demonstration and field tests for the project will be evaluated based on both the physical performance of the product and the potential for adverse impact on public health and the environment. If deemed successful, a case-specific BUD may be granted for regular and continued use of the product.

If the upland use involves production of aggregates at a facility permitted pursuant to RCRA subtitle C, all existing RCRA subtitle C facility permit conditions must be met. Any aspects of the material management at the facility that cannot be regulated under the existing RCRA subtitle C permit would be included in the RD&D permit.

In-Water/Riparian Management

The applicant should submit a proposal for an in-water/riparian beneficial use project to the Division of Environmental Permits within the Regional Office for the NYSDEC region where the dredged material is proposed to be used. The application would be reviewed by the Division of Fish, Wildlife and Marine Resources, the Division of Water, and the Division of Environmental Permits. A §401 certification would be issued for the dredging and dredged material disposal operations. All involved divisions would be responsible for reviewing the §401 certification prior to its finalization. The project would be evaluated for its potential impact on benthic organisms, water quality, fisheries resources, etc. prior to the issuance of the §401 certification. The *1994 Interim Guidance Freshwater Navigational Dredging* would be used as a guide in evaluating the project.

For a project involving beach/littoral nourishment, Coastal Erosion, Tidal Wetlands, and Protection of Waters are the applicable programs/regulations. From a habitat perspective, NYSDEC balances the environmental impacts (usually localized losses of benthos and open water) against a demonstration of social need (flood protection, public safety), which is usually a persuasive argument. Without that demonstration, however, a project would be unlikely to meet standards for permit issuance under Article 15 of ECL §15-0505, which regulates placement of material in a waterway and Article 25, known as the Tidal Wetlands Act under ECL §25-0401.

PROJECT MONITORING

Upland Management

Once a BUD is granted, the dredged material ceases to be considered a solid waste and is no longer subject to monitoring or other solid waste regulatory requirements. NYSDEC Division of Solid and Hazardous Materials has monitoring authority over beneficial use projects that involve upland management/application and as such may inspect beneficial use project sites/applications from time to time to ensure compliance with the BUD provisions. In some cases, processing of dredged

material to meet BUD provisions must occur at facilities that are subject to Solid Waste Facility permitting requirements, which may include facility monitoring. However, there is no specific monitoring requirement or schedule as part of the BUD process. Rather, the BUD for the material would be written with conditions requiring whatever monitoring would be necessary to ensure the protection of public health, the environment and natural resources.

In-Water/Riparian Management

U.S. EPA and the Corps have monitoring authority over beneficial use projects that occur in federal waters. NYSDEC Division of Water has monitoring authority for in-water/riparian management beneficial uses in state waters. Currently, there are no state regulations for in-water/riparian management of dredged material. Used during project review, the *Interim Guidance for Freshwater Navigational Dredging* (October 1994) describes monitoring guidelines for in-water/riparian management of dredged material. Monitoring is routinely required as a special condition in either the §401 certification or Article 15 dredging permit for dredging and disposal operations.

Monitoring of the water during and after implementation of an in-water/riparian beneficial use project could be conducted by the NYSDEC Division of Water personnel or it could be required to be conducted by the dredging applicant as a special condition of the §401 certification or Article 15 permit. The NYSDEC Division of Water would review the monitoring results for compliance with conditions in the §401 certification. Monitoring of fish, wildlife and other water dwelling organisms could be the responsibility of the Division of Fish, Wildlife and Marine Resources. This type of monitoring could also be required of the applicant as part of the permit.

DMMPs

For both upland management and in-water/riparian management, the DMMPs developed for a specific area of the state outline the potential beneficial use projects available at that location. There is no overall DMMP for the Great Lakes portion of New York State. Individual plans called Preliminary Assessments were developed by the Corps for specific harbors in the Great Lakes region. Corps authority under §204 of WRDA 1992 for implementing aquatic ecosystem restoration projects in connection with dredging is where beneficial uses of dredged material in the Great Lakes basin are delineated.

State Notes

The most common upland beneficial use of dredged material is in landfill cover materials. New York continues to receive and evaluate proposals for innovative beneficial use projects. Projects currently underway or anticipated include the use of dredged material in the manufacture of cement, road subbase, hot-mix asphalt and lightweight aggregate. Use of waste materials as a component in or substitute for a commercial product may require adherence to industry standards. For example, the use of contaminated sediment in the manufacture of road construction materials would require that the beneficially used product meet applicable DOT and ASTM standards.

NYSDEC and the public have many concerns about some of the proposed in-water beneficial uses of dredged material. Habitat trade-off is a problematic concept and many of the beneficial use options involve a trade-off of one kind or another. The net benefit of an option decreases with increasing value of the habitat that will be lost or altered. NYSDEC regulations call for protecting habitat for its present and potential value. Therefore, it will be difficult for a project applicant to justify the trade-off for "net benefit" over restoration/enhancement of existing habitat in an alternatives analysis. Of course, the burden of proof decreases in highly degraded areas. For example, wetlands creation in degraded areas or dead-end basins is preferable to the displacement of viable habitat. DEC would need a strong demonstration of ecological improvement before any habitat exchange would be considered.

OHIO

BENEFICIAL USE DEFINITION

The regulatory status of beneficial use is very limited under Ohio solid waste statutes and regulations. Ohio's solid waste program, administered by the Division of Solid & Infectious Waste Management (DSIWM), does have a distinct beneficial use program but it is limited under law to scrap tires (Ohio Administrative Code (OAC) Rule 3745-27-78). Certain wastes that are excluded from the Ohio statutory and regulatory definitions of solid waste (nontoxic bottom ash, fly ash and spent foundry ash) are addressed under a Division of Surface Water (DSW) policy [0400.007], which does consider beneficial uses of these specific wastes.

To facilitate both traditional and alternative waste management proposals, the Ohio Environmental Protection Agency (Ohio EPA) has summarized the various regulatory obligations, needed approvals, and Ohio EPA's review "division of labor" for a number of waste management practices. This summary is called the Interim Alternative Waste Management Program (IAWMP). IAWMP outlines that DSIWM regulates by permit/license/registration the disposal of all types of solid wastes, including: landfilling, incineration, composting and other methods of disposal. Proposals that are often viewed as "beneficial uses" are authorized and regulated under this "other methods of disposal" category. The result is that alternative waste management practices (beneficial use proposals) are reviewed on a case-by-case basis and often authorized through an exemption from the traditional state disposal regulations, with enforceable conditions tailored to the alternative waste management proposal. DSW regulates agronomic land application of sludge, composting of certain sludge/manure, nontoxic bottom ash, fly ash, spent foundry ash and other non-solid wastes through permit/sludge management plans.

WATER QUALITY REGULATIONS

In all states except Michigan, §404 of the Clean Water Act designates the Corps as the lead agency for dredging permitting responsibilities. Section 404 applies to the disposal of dredged material into lakes, rivers and wetlands. It also applies to any "return water," or effluent, from upland disposal of dredged material. Accordingly, §404 does not apply specifically to the placement of dredged material at upland sites, only the effluent from these sites. Section 401 provides all of the states the authority to issue certification that proposed dredge and fill disposal activities will not violate applicable state water quality standards. A §401 certification is required for any discharge regulated under §404 that is not regulated under another program (e.g., NPDES). The §401 certification is not a permit, but its denial has the same effect as a negative permit determination, in that the Corps will not issue a §404 permit if a §401 certification is denied.

In Ohio, §404 and §401 reviews are essentially the only current mechanism that Ohio EPA uses to promote or regulate the beneficial use of dredged materials. If the applicant so chooses, beneficial use can be part of the §404 and §401 certification. The Corps must be in agreement over jurisdiction and need for a §401 certification. That is, beneficial use projects would "require" §401 certification only when the Corps asserts jurisdiction and only when the Ohio EPA would have cause to deny the dredging, or otherwise stipulate such onerous conditions, that the "regulation" of the beneficial use through special §401 conditions are acceptable to the applicant.

OTHER APPLICABLE REGULATIONS

Ohio regulates dredged material through the §404/§401 process. Additional approvals may be necessary depending upon the end use of the material.

Upland Management

Beneficial uses in an upland environment would be evaluated under IAWMP by the Ohio EPA Division of Surface Water. If the beneficial use project involves an Ohio Department of Natural Resources (ODNR) -regulated mine, the statutory and regulatory approval authority comes from

Ohio Revised Code (ORC) ch.3734 section 02, division G, or OAC ch. 3745-27-05(A)(4). Other engineered uses, like construction fill, soil enhancement and a variety of other upland management activities commonly considered beneficial use, follow the same procedures. The *Ohio EPA Land Application of Biosolids Manual,* (1998) is often used for guidance for land application projects.

In-Water Management

Beach nourishment and other in-water activities commonly considered beneficial use are subject to the §404/§401 permitting process. Projects that will place dredged material on submerged lands require a Submerged Lands Lease from the ODNR. This lease is issued under the Real Estate and Land Management program.

The Coastal Management Program (CMP) under the state Coastal Zone Management Act has developed general priorities for the location of dredged material disposal sites. The CMP reflects the current regulatory status of programs at federal and state levels. In a very broad sense, the CMP sets priorities to reflect the sensitivity of lake, coastal and upland areas. If the dredged material is mostly sand, then in-water placement is preferred. As part of the §404/§10 permit process, The Ohio Division of Geologic Survey (DGS) requests that samples be collected to determine their suitability, based on texture, for shoreline/nearshore disposal. For example, sediment containing greater than 80 percent sand and gravel is generally deemed suitable for nearshore disposal or beach nourishment. If the material is determined to not be suitable for open-lake disposal, then upland disposal sites and CDFs are evaluated.

Contaminant Criteria

If the dredged material is a listed hazardous waste or exhibits a hazardous waste characteristic, then it is not eligible for beneficial use.

If the material is not hazardous but is to be evaluated for a beneficial use, then many different contaminant criteria may be used to assess the safety of the proposed beneficial use. These criteria could include voluntary action program (i.e., brownfields cleanup) standards, U.S. EPA's Region 9 preliminary remediation goals, sewage sludge total metals limits, toxic characteristics leaching procedure (TCLP) testing, priority pollutant scans, solid waste regulations, and pathogens. In addition to these criteria, federal regulations [CFR 503-metals limits] are often used for beneficial use projects.

Regulatory Process

If dredge and fill activities require federal licenses or permits such as §404/§10 permit from the Corps, a §401 Water Quality Certification is needed. There have been several attempts to beneficially use sediments dredged from federal navigation channels at some of the harbor areas along Lake Erie, such as harbors in Sandusky, Cleveland, Fairport and Conneaut, as well as numerous projects involving material dredged from nonfederal channels.

Though not regulatory documents, Remedial Action Plan reports, the draft *Lake Erie Protection and Restoration Plan,* and other documents from the ODNR and Corps encourage the use of sediments with a high sand content for beach nourishment. If sand content is greater than 80 percent, sediment is deemed suitable for beach/littoral nourishment.

For a beach/littoral nourishment project, the proposal would be shared by the Ohio EPA and the ODNR. Ohio EPA focus would be on the quality and contaminant levels of the material. Testing would be required to assess particle size and commonly encountered pollutants, such as metals, organochloride pesticides, polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs). The ODNR would focus on the quantity of dredged material and its expected impact on the resource. Impacts on recreation, such as impacts on bathing beaches and watercraft use, might be a concern depending on location. The expected impact on erosion also would be evaluated.

In-water projects can only be regulated in the sense that certain special conditions may be included in a §401 certification when granted. These conditions could require the applicant to perform initial and/or ongoing testing for contaminants and particle size. The condition may also stipulate specific requirements for the timing and mechanism of material delivery to the site.

Project Monitoring

Post-project monitoring for the beneficial use of dredged material is established on a case-by-case basis.

DMMPs

Dredged material management plans are important for beneficial use projects. The Long Term Sediment Management Strategy for Toledo Harbor is the driving force for the evaluation of beneficial use projects and funding for studies related to the development of topsoil from sediment in that area.

State Notes

Ohio coastal management personnel believe that the federal government needs to modify the federal standard for considering dredged material disposal/management options to recognize the environmental benefits associated with the application of sandy dredged material for beach/littoral nourishment.

Most beneficial use of dredged material projects in Ohio have occurred at private facilities, primarily for beach/littoral nourishment. Manufactured soil using sediment from the Toledo CDF is another type of beneficial use that has occurred. Several projects made "new soil" by mixing water treatment plant lime sludge with dewatered sediment from CDFs. Clean sediment was used in these cases; the main contaminant standard that needed to be reached dealt with pathogens. (See section on "Beneficial End Uses of Dredged Material: Selected Projects in the Great Lakes Basin.")

Pennsylvania

Beneficial Use Definition

Act 97, Pennsylvania's Solid Waste Management Act, defines beneficial use as "use or reuse of residual waste for commercial, industrial or governmental purposes, if the use does not harm or threaten public health, safety, welfare or the environment; or the use or reuse of processed municipal waste for any purpose, if the use does not harm or threaten public health, safety, welfare or the environment." Presently, the Pennsylvania Department of Environmental Protection (DEP) considers dredged material as construction/demolition solid waste, and this material can be considered for beneficial use projects. As of mid-2000, the DEP was in the process of redefining "fill" and the draft policy should include uncontaminated dredged material in its definition of fill.

Water Quality Regulations

In all states except Michigan, §404 of the Clean Water Act designates the Corps as the lead agency for dredging permitting responsibilities. Section 404 applies to the disposal of dredged material into lakes, rivers and wetlands. It also applies to any "return water," or effluent, from upland disposal of dredged material. Accordingly, §404 does not apply specifically to the placement of dredged material at upland sites, only the effluent from these sites. Section 401 provides all of the states the authority to issue certification that proposed dredge and fill disposal activities will not violate applicable state water quality standards. A §401 certification is required for any discharge regulated under §404 that is not regulated under another program (e.g., NPDES). The §401 certification is not a permit, but its denial has the same effect as a negative permit determination, in that the Corps will not issue a §404 permit if a §401 certification is denied.

In addition to §404/§10 federal certification, a §401 water quality certification, which regulates water quality impacts, and a Water Obstruction and Encroachment Permit are required for all dredging projects. Water Obstruction and Encroachment permits regulate those dredging projects that change, expand or diminish the course, current or cross section of a watercourse, floodway or body of water and are reviewed by the Regional Soils and Waterways Section of the DEP.

Other Applicable Regulations

Any dredge or fill activity that involves construction and maintenance of a dredged disposal dike also must comply with Pennsylvania's Clean Streams Law that states that these activities require an Erosion and Sedimentation Control Plan. As of January 2001, the Pennsylvania DEP was developing a Safe Fill Regulatory Package that also includes permit by rule provisions, which would allow unrestricted movement and use of uncontaminated dredge material and beneficial uses of contaminated dredged material on land.

According to a survey of Pennsylvania's dredging policies conducted by the National Oceanic and Atmospheric Administration's (NOAA) Coastal Program, a beneficial use project requires a Corps/Pennsylvania State Programmatic General Permit.

Contaminant Criteria

Chemical parameters and dredged material disposal requirements outlined in the Delaware Estuary Coastal Zone Title 25, Chapter 16 (Water Quality Toxics Management Strategy) are used to determine the level of contamination in dredged material. In addition to the parameters included in this strategy, such as metals, volatile and semivolatile organics, pesticides, TPH, pH and PCBs, the applicant is requested to perform the Toxicity Characteristic Leaching Procedure (TCLP) and Modified Elutriate Test.

Regulatory Process

The commonwealth has no policies or processes that specifically address beneficial use of dredged material. Beneficial use projects, therefore, are considered on a case-by-case basis. Generally, after §404/§10 federal certification, §401 Water Quality Certification and a Water Obstruction and Encroachment Permit are approved, the beneficial use project requires a Corps/Pennsylvania State Programmatic General Permit. According to NOAA's Coastal Program survey, "the general permit program is well-established with permitting procedures and policies that include description and characterization of chemical and physical properties of the waste, testing and analysis, limits to be met, and a demonstration that the beneficial use will not harm or impact human health or the environment." The U.S. EPA's SW-846 methodologies are used to review and approve the general permits.

Project Monitoring

It is not clear what role project monitoring plays, if any, in the beneficial use of dredged material.

DMMPs

It is not clear what role dredged material management plans play, if any, in the beneficial use of dredged material.

State Notes

Although Pennsylvania does not have a codified beneficial use policy, there have been several beneficial use projects undertaken by the commonwealth, including beach nourishment, abandoned mineland and construction projects.

WISCONSIN

BENEFICIAL USE DEFINITION

Dredged material, defined as "any solid waste removed from the bed of any surface water," is considered a solid waste under Wisconsin's solid waste disposal rules [Chapter NR 500.03 (71), Wisconsin Administrative Code]. This code defines beneficial use as "the recycling or use of solid waste in a productive use" [ch. NR 500.03 (19), Wisc. Adm. Code].

WATER QUALITY REGULATIONS

In all states except Michigan, §404 of the Clean Water Act designates the Corps as the lead agency for dredging permitting responsibilities. Section 404 applies to the disposal of dredged material into lakes, rivers and wetlands. It also applies to any "return water," or effluent, from upland disposal of dredged material. Accordingly, §404 does not apply specifically to the placement of dredged material at upland sites, only the effluent from these sites. Section 401 provides all of the states the authority to issue certification that proposed dredge and fill disposal activities will not violate applicable state water quality standards. A §401 certification is required for any discharge regulated under §404 that is not regulated under another program (e.g., NPDES). The §401 certification is not a permit, but its denial has the same effect as a negative permit determination, in that the Corps will not issue a §404 permit if a §401 certification is denied.

In Wisconsin, beneficial use can be proposed as part of a §404 permitted activity. If the proposed beneficial use does not require a §404 permit, a §401 water quality certification is not required. For projects requiring a §404 dredging permit, the permit once issued becomes the §401 water quality certification.

The §401 certification process requires all projects (except Corps projects completed within federally authorized project areas) to be in compliance with a number of state statutes, including §30.20, which regulates dredging projects. Those Corps projects completed within federally authorized project areas do require a water quality certification under §401 and NR-299 Wisconsin Administrative Code.

OTHER APPLICABLE REGULATIONS

According to chapter NR 347.01 (2) of the Wisconsin Administrative Code, "it is Wisconsin Department of Natural Resources' (WDNR) policy to encourage reuse of dredged material and to minimize environmental harm resulting from a dredging project."

The types of beneficial use projects allowed can vary both based on the end use (i.e., upland or in-water) and the quality of the dredged material. If the project is being proposed by the Corps as part of an authorized Corps dredging project, the Corps takes the lead and would involve other federal agencies, such as the U.S. EPA, and U.S. Fish and Wildlife Service, as required by §404, §401, and §10 federal regulations. Local sponsors are normally required to seek the necessary state approvals and/or permits. For non-federal projects, the various permitting or approval regulations (§404, §401, Wisconsin. Ch. 30 laws) would dictate the level and timing of involvement by various agencies.

Each beneficial use project is considered on a case-by-case basis. If potential benefits appear to outweigh damages, the WDNR will determine the best regulatory fit for the project and work with local sponsors and others to make the project a reality through the creative use of the existing regulatory programs referenced below. With the exception of beach nourishment, there is no institutionalized process for evaluating proposed beneficial use projects and the actual process varies depending on type of project proposed.

Upland Management

For projects involving upland application, the state's solid waste disposal rules apply. Pursuant to §289 Wisconsin Statutes (Solid Waste Facilities), state solid waste rules are codified in NR 500

Wisconsin Administrative Code. These rules are based on federal requirements for solid waste management and disposal set forth in TSCA and RCRA. For instance, PCB disposal levels are TSCA-based while Wisconsin Solid Waste Regulations are similar to RCRA, Subtitle D. The WDNR's Division of Air and Waste-Bureau of Waste Management handles solid waste approval and licensing.

Chapter NR 500.08 (5)(a) of the Wisconsin Administrative Code entitled "Beneficial Reuse" allows the WDNR to grant exemptions from the state solid waste regulations for the purpose of allowing or encouraging the recycling of solid wastes." Additionally, Wisconsin general solid waste management requirements [NR 500.08(3), Wisconsin Administrative Code] provide exemptions from solid waste facility planning licensing requirements for beneficial use of "non-hazardous" dredged material, including:

- The disposal of less than 3,000 cubic yards of dredged material from Lake Michigan, Lake Superior, Wisconsin River, the Sheboygan River, the Fox River, the Milwaukee River, the Brule and Menominee rivers; and
- Materials from inland lakes and ponds that have not been treated with arsenical.

Typically, dredged materials not meeting exemption requirements of NR 500.08 (most often because volume exceeds 3000 cubic yards) might be placed in a site subject to a "one time" upland disposal approval authorized under sect. 289.43(8) Wisconsin Statutes, which allows for an exemption from regulation of low-hazard waste.

To qualify for any exemption, beneficial use projects must comply with NR 504.04 (4) Wisconsin Administrative Code, which sets forth state locational criteria and performance standards for landfills.

In-Water Management

In-water beneficial use projects are more complicated because state law regulating the structures and deposits in navigable waters [§30.12 (1) Wisconsin Statutes] generally prohibits the deposition of dredged material on the floor of a navigable waterway. Because of this, any beneficial use proposal that envisions placement of fill on the bed of a waterway must be authorized by an exception to the general rule. Generally, solid waste disposal rules do not apply to beach nourishment projects because beach nourishment projects are regulated under state waterway alteration laws contained in Chapter 30 Wisconsin Statutes.

Numerous water regulation laws allow the WDNR to "creatively" regulate projects to allow for in-water beneficial use projects. For instance, some in-water beneficial use projects, such as an experimental beach nourishment project at Wisconsin Point on Lake Superior, have been allowed through the use of a simple "sandblanket" permit [§30.12(3) (a) Wisconsin Statutes]. A sandblanket is defined as a layer of sand or gravel placed in a lake for recreational use. This permit is issued by WDNR's Bureau of Fisheries and Habitat Protection.

Other in-water beneficial use projects, such as beach nourishment at Two Rivers and Kewaunee on Lake Michigan, or barrier island creation at Pensaukee Harbor in Green Bay have required approval of bulkhead lines and leases from the state and also were permitted through this program [§30.11 (a) Wisconsin Statutes]. Wisconsin Statute §30.11 outlines the process for establishing a bulkhead line. A bulkhead line is a shoreline legislatively established by a municipality and approved by WDNR. The municipality must provide a metes and bounds survey of the area to be encompassed by the bulkhead line. Once a bulkhead line is approved, a riparian owner may place fill up to the bulkhead line. In Wisconsin, the beds of all natural lakes are owned by the state; therefore, placing fill behind a bulkhead line more than a few feet from shore requires, in addition to the bulkhead line approval, a

lease of public lands from the Board of Commissioners of Public Lands. All review and administrative processes for establishment of a bulkhead line and for obtaining a lease covering submerged lands are handled by the WDNR, Division of Waters, Bureau of Fisheries and Habitat Protection. The lease itself is issued by the Board of Commissioners of Public Lands, which consists of the State Attorney General, State Treasurer and Secretary of State.

In other cases, legislative lake bed grants (§30.05 Wisconsin Statutes) or other specific legislation was necessary to allow a project to move forward, such as a project that facilitated the creation of a breakwater island in Lake Winnebago. In this instance, §30.203 authorizes the WDNR to complete implementation of the Lake Winnebago Comprehensive Management Plan. It is important to note that, although this is not specifically a beneficial use project, the mechanism would apply to certain types of beneficial use projects that are located in a waterway. Under Wisconsin law, only a riparian owner has the right and ability to receive certain types of waterway alteration permits (fills behind bulkhead lines, certain structures, etc.) In the Winnebago case, the state is not a riparian owner thereby having no legal ability to place structures and islands in the lake. Specific legislation was enacted that authorized the state to complete the project. Without that type of legislation, certain parts of the project would have been prohibited under the general prohibition of §30.12 Wisconsin Statutes or could have only been completed by riparian owners.

A major island habitat restoration project utilizing dredged material in lower Green Bay (Cat Islands) is currently in the planning stages. Specific legislation, similar to the Winnebago project, will be required to implement the project proposal.

Wisconsin Administrative Code NR-347 sets standards that must be met for dredged material to be used for littoral drift or beach nourishment projects. This standard is that "the average percentage of silt plus clay (material passing a #200 sieve or less than .074 mm diameter) in the dredged material does not exceed the average percentage of silt plus clay in the existing beach by more than 15 percent and the color of the dredged material does not differ significantly from the color of the beach material." The analysis should also include physical properties, such as sediment particle size and color of sediment representative of the beach area or littoral area to be nourished. Sediment analysis should be accompanied by a map showing specific sample locations, proposed nourishment areas, dredged areas, and a description of the type of dredge plan to be used.

Contaminant Criteria

If the dredged material is identified as toxic or hazardous under Wisconsin's solid waste disposal rules (NR 500 Wisconsin Administrative Code) or the state's hazardous waste regulations (NR 500 Wisconsin Administrative Code), it is not considered for beneficial use projects. For example, if the material has detectable levels of polychlorinated biphenyls (PCBs), it cannot be used for upland applications such as soil enhancement. Contaminant criteria are established through solid waste disposal rules and rely, to some extent, on federal TSCA or RCRA requirements. These rules specify how sediment samples are to be collected and analyzed and include a list of specific compounds that must be identified and quantified.

There are no specific rules that determine what is considered "clean" dredged material for purposes of beneficial use. In most cases, in-place sediment contaminant levels, for parameters listed in NR-347, Table 1, are compared to typical background levels for the same contaminants found in soils from Wisconsin and neighboring states as well as to sediments of Lake Michigan and Green Bay. Those sediments that are similar to these background levels are considered clean. The criteria used to determine whether dredged material is considered "non-hazardous" are listed in NR-605 (Identification and Listing of Hazardous Waste).

Regulatory Process

If the beneficial use project involves a discharge of material into waters of the United States, a §404 permit (issued by the Corps) is required, as is a §401 water quality certification (issued by the state) and a Federal Consistency Certification under the state's Coastal Zone Management Program. All dredging projects, except Corps projects completed within federally authorized project areas, require approval pursuant to §30.20 Wisconsin Statutes (removal of material from beds of navigable waters). Applicants are encouraged to contact local WDNR water regulation staff and submit a "pre-application" prior to making a formal application for dredging approval. As described in NR 347 Wisconsin Administrative Code, this pre-application process facilitates WDNR assessment of the appropriate sediment sampling and analysis methodologies, monitoring protocols and disposal criteria for dredging projects.

Only one beneficial use of dredged material, beach nourishment, is addressed in NR 347. For beach nourishment projects, all review and regulatory process is coordinated by field staff assigned to the Division of Water, Bureau of Fisheries and Habitat Protection. Steps in agency evaluation are as follows:

1. Request that the project sponsor provide results of analysis of sediment following the protocols identified in NR-347 Wisconsin Administrative Code for parameters identified in table one of that code. The analysis should also include physical properties (sediment particle size and color) of sediment representative of the beach area or littoral area to be nourished. Sediment analysis should be accompanied by a map showing specific sample locations, proposed nourishment areas, dredged areas, and a description of the type of dredging plan to be used.
2. Information provided will be used to determine if the material matches the representative beach characteristics as required in NR-347.07(4) and whether the material is considered contaminated (compared to background contaminant levels) or hazardous under NR-600 Wisconsin Administrative Code requirements.
3. If the material is considered suitable for beach nourishment, the proposed dredge area and the proposed receiving area will be evaluated for the potential impact of the project on fish and wildlife habitat, water quality, natural scenic beauty, endangered resources, public rights in navigable water, and impact on adjacent property owners (pursuant to public interest tests of §30.20 and §30.11 Wisconsin Statutes).
4. If sediment characteristics indicate the material is suitable for beach nourishment and if the preliminary public interest evaluation shows non-significant impacts, the project sponsor will be asked to submit applications for dredging authorization under §30.20 Wisconsin Statutes and to obtain a bulkhead line approval under §30.11 Wisconsin Statutes.
5. Upon receipt of the formal applications, the department completes the required public interest review and prepares an environmental assessment under NR 150 Wisconsin Administrative Code. As part of the public interest review, §30.11 requires that local county clerk, town city or village clerk, and the Corps have an opportunity to review and comment on the proposed bulkhead line. NR-150 requires a notice to the public that an environmental assessment has been prepared and is available for public review and comment.
6. If the project meets the statutory criteria for approval pursuant to §30.20 and §30.11 Wisconsin Statutes the permits/approvals are granted. Note: §30.20 and §30.11 require that the department make a finding that the project "will be consistent with the public interest" before a permit can be issued or a bulkhead line approval is granted. Most permits or approvals contain conditions necessary to protect the public interest.
7. The local sponsor submits the approved bulkhead line to the Board of Commissioners of Public Lands to secure a lease of public lakebed pursuant to §24.39 Wisconsin Statutes.
8. The Board of Commissioners issues the required lease.

9. The project can commence, subject to conditions of any permits and approvals issued by WDNR and consistent with the terms of any lease issued by the Board of Commissioners of Public Lands.

PROJECT MONITORING

Project monitoring requirements are determined on a case-by-case basis and depend upon the quality of the dredged material, the type of project and the expected outcomes. Monitoring can be related to water quality issues, habitat values or other considerations. The permit or approval issued will specify the type of monitoring necessary. The project sponsor or permit holder is generally responsible for assuring compliance with monitoring requirements.

DMMPS

To date, DMMPs have played a minor role, at best, in beneficial use projects in Wisconsin. If considered during plan development, DMMPs could play a major role in resolving/enhancing coordination between agencies, resolving dredge disposal issues and proactively supporting beneficial use projects. DMMPs could allow for comprehensive review of all dredged material disposal options and would enable the various agencies involved to address regulatory considerations in advance of project implementation. DMMPs also could facilitate consideration of dredged material disposal needs, including beneficial use options, on a long-term basis. One of the larger problems indicated is timing of beneficial use projects because, often, the regulatory process takes so long that the opportunities for beneficial use projects vanish. DMMPs can go a long way in eliminating this problem of timing.

STATE NOTES

Examples of beneficial use projects in Wisconsin include beach nourishment, soil enhancement, habitat development and wetland restoration, and aggregate extraction and its use as construction fill. Aggregate extraction is the mechanical separation of sand and gravel from finer sediments such as clay and silt. The coarser material can be used for numerous construction activities (e.g., road building, concrete work), provided it is considered not contaminated. In parts of the state (Lake Superior region, for example) naturally occurring deposits of 'aggregate' are scarce. Because of this, a potential demand for graded dredged material could exist.

The WDNR has a Contaminated Sediment Program that aims to develop a statewide strategic plan for managing contaminated sediments. The program addresses dredging and associated contaminated sediment issues, including remediation, handling and disposal of contaminated sediments and appropriate treatment technologies. In support of the program, the state has established a Contaminated Sediments Advisory Committee–a state-led, multi agency effort with representation from the Bureau of Watershed Management, the Bureau of Remediation and Redevelopment, and other bureaus within the WDNR as well as representation from the Corps. The group has not yet developed any policies or established any regulatory processes with implications for beneficial use of dredged material.

Wisconsin also has established a PCB Soil Criteria Group with representation from the U.S. EPA and Corps. The PCB Soil Criteria Group has been very active in looking at PCBs in dredged material and implications for beneficial use. An initial risk analysis conducted by the state evaluated PCB levels for potential dredged material application on agricultural lands. The results revealed extremely low numbers and have raised questions about the propriety of dredged material application on agricultural lands as a beneficial use. They also have raised questions about the future of other beneficial use applications within the state where human exposure routes are limited. The PCB Soil Criteria Group would like the state to conduct risk analyses for other beneficial use applications with more limited human exposure routes, such as construction fill. Though it could help in the development of standards for other types of beneficial use projects, to date, the state has not yet conducted such analyses.

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REFERENCES

Beneficial Use Survey. Association of State and Territorial Solid Waste Management Officials. April 2000.

The Beneficial Use of Dredged Material for Upland Disposal. Harding Lawson Associates. Novato, California. April 2000.

Case Studies: Characterization Tests to Determine Dredged Material Suitability for Beneficial Uses Technical Note DOER-C7. U.S. Army Corps of Engineers. July 1999.

Decisionmaking Process for Dredged Material Management. Great Lakes Dredging Team. January 1999.

Dredged Material Characterization Tests for Beneficial Use Suitability. Technical Note DOER-C2. U.S. Army Corps of Engineers, May 1999.

Dredged Material Management and State Coastal Programs: Lessons from a Workshop in New Orleans, Louisiana. Proceedings prepared by the National Academy of Public Administration for the National Dredging Team. January 1999.

Dredging and the Great Lakes. Great Lakes Dredging Team. Great Lakes Commission. October, 1999.

National Coastal Program Dredging Policies: An Analysis of State, Territory, and Commonwealth Policies Related to Dredging and Dredged Material Management. Volumes I and II. National Oceanic and Atmospheric Administration. April 2000.

Presentation Summaries: Remediation of Dredged Material. Unpublished paper produced by the State of New York and City of New York in cooperation with the Third Annual Dredging Conference of the Maritime Association of the Port of New York and New Jersey. November 1996.

Workshop on Treating Great Lakes Contaminated Sediment: Unpublished presentation summaries. U.S. Environmental Protection Agency-Great Lakes National Program Office. April 2001.

APPENDIX A

Great Lakes Commission des Grands Lacs

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Resolution
Making Beneficial Use of Dredged Material a Policy Priority

Whereas, dredging in the Great Lakes has been undertaken for 150 years to deepen and maintain navigation channels and for other purposes such as waterfront construction, utilities placement and environmental remediation; and

Whereas, 80 to 90 percent of material dredged from Great Lakes waterways is either discharged into open waters or placed in a confined disposal facility (CDF); and

Whereas, most CDFs will be full or at design capacity during this decade and open water placement is prohibited by some Great Lakes states and is coming under increasing scrutiny; and

Whereas, most of the dredged material disposed of in open waters of the Great Lakes is not contaminated and can be used beneficially instead; and

Whereas, with proper testing and guidelines to protect human health and the environment, beneficial use of dredged material offers a sustainable long-term management option for dredged material management in the Great Lakes basin; and

Whereas, successful beneficial use projects have demonstrated that dredged material can provide an alternative source of material for beach/littoral nourishment, habitat creation and restoration, landscaping, topsoil creation and enhancement, land creation and reclamation, and in the manufacture of aggregates for marketable products such as cement or glass; and

Whereas, the Great Lakes Commission's Beneficial Use of Dredged Material Task Force has found that:

- reuse and recycling of dredged material should take priority over disposal where possible
- technological advances and risk assessment procedures can allow dredged material that is not pristine to be used safely and beneficially
- there is currently no federal regulatory framework governing the beneficial use of dredged material
- Great Lakes states have disparate and often insufficient, and sometimes contradictory policies and programs for testing and evaluating dredged material for beneficial use applications
- the lack of federal and state regulatory frameworks for beneficial use of dredged material is a major obstacle to beneficial use in the Great Lakes basin

Therefore, Be It Resolved, that the Great Lakes Commission recommends that its member states should make beneficial use a policy priority for dredged material management; and

Be It Further Resolved, that the Great Lakes Commission urges Congress to expand the authority of the Army Corps of Engineers under Section 204 of the Water Resources Development Act of 1992 to include a wide range of beneficial uses in addition to the protection, restoration and creation of aquatic habitat; and

Be It Further Resolved, that Great Lakes Commission recommends that its member states individually undertake multi-agency initiatives to evaluate existing state policies for purposes of developing comprehensive state programs for testing, evaluating and managing dredged material as a resource; and

Be It Finally Resolved, the Great Lakes Commission encourages it member states to work with the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency to coordinate state policies in the interest of developing of a regional framework for beneficial use.

Unanimously adopted by the eight member states of the Great Lakes Commission at the 2001 Semiannual Meeting in Ann Arbor, Mich., May 16, 2001.