Application for Ohio Environmental Protection Agency (OEPA) Section 401 State Water Quality Certification

DISCHARGES OF DREDGED MATERIAL ASSOCIATED WITH 2016 MAINTENANCE DREDGING OF LORAIN HARBOR, OHIO

Item 5 - Proposed Project Antidegradation Analysis

Section 1: Antidegradaton Analysis

1 1.1 Project Description

The project will entail the maintenance dredging of sediments from the authorized Federal navigation channels of Lorain Harbor, Lorain County, Ohio. The channels will be dredged to authorized depth (Figure 1 in Item 6). Up to an additional one foot of sediment may be removed to ensure the minimum depth is achieved and to account for dredging tolerance. An estimated total of approximately 225,000 cubic yards of material will be dredged from Lorain Harbor Federal navigation channels during the 2016 dredging operation (minimum degradation alternative). Dredging would not take place upstream of (RM) 2.25 in 2016. All of the dredged material will be placed in the 1.5 square mile (960-acre) earth material portion of the harbor's designated open-lake placement area, the center of which is located 3.5 miles north of the Lorain West Harbor Light at an azimuth of 350° 00' (Figure 2 in Item 6). This site has been used by the USACE since the 1930's for placement of Lorain Harbor dredged material. The dredging is scheduled to occur between 1 July 2016 and 15 April 2017. The project will be accomplished by a contractor of the Federal government.

The purpose of the project is to maintain sufficient water depths for commercial navigation. This project was congressionally authorized by the 1875, 1886, 1888, 1896, 1899, 1902, 1907, 1910, 1916, 1917, 1935, 1937, 1945, 1958, 1960 and 1962 River and Harbor Acts, 1976 and 1986 Water Resources Development Acts, 1985 Supplemental Appropriations Act and 1988 Energy and Water Appropriations Act. If the Federal navigation channels are not dredged to authorized depth, commercial navigation will eventually be adversely affected.

The environmental effects of the dredging operations are documented in the ***Final Environmental Statement, Lorain Harbor, Lorain County, Ohio (Maintenance) (1974); Final Environmental Statement, Diked Disposal Site Facility Site No. 7, Lorain Harbor, Lorain County, Ohio (1975); Section 404(b)(1) Evaluation, Lorain Harbor Operations and Maintenance, Lorain, Ohio (1981); Environmental Assessment and Finding of No Significant Impact (EA/FONSI), Operations & Maintenance (Dredging and Open-lake Placement of Dredged Material) (2006); and Environmental Assessment and Finding of No Significant***

Impact (EA/FONSI), Operations & Maintenance (Dredging and Open-lake Placement of Dredged Material) (2009). These documents, and supplemental documentation, have been submitted to USEPA. Copies are available for examination at the Buffalo District office.

Material in the Lorain Harbor Federal navigation channels consists primarily of silts and clays, with some fine sands and gravels. The quality of the material has been evaluated using recent sediment data in accordance with formal Federal guidance contained in the U.S. Environmental Protection Agency (USEPA)/USACE Great Lakes Dredged Material Testing and Evaluation Manual (1998) and Evaluation of Dredged Material for Discharge into Waters of the U.S.—Testing Manual (1998). This evaluation concluded that bottom sediments to be dredged from the Lake Approach and River Channel upstream to River Mile (RM) 2.25/Station 143+47 meet Federal guidelines for open-lake placement (Figure 1). Dredging would not take place upstream of RM 2.25 in 2016. Consequently, material dredged from these reaches of Lorain Harbor has been determined to meet Clean Water Act Section 404(b)(1) Guidelines for open-lake placement, and all of the dredged material will be placed in the 1.5 square mile (960-acre) earth material portion of the harbor's designated open-lake placement area, the center of which is located 3.5 miles north of the Lorain West Harbor Light at an azimuth of 350° 00' (Figure 2). This site has been used by the USACE since the 1930's for placement of Lorain Harbor dredged material.

2 1.1.1 Preferred Design Alternative

This alternative would entail the dredging of an estimated 500,000 cubic yards of material from the Federal navigation channels in 2016, with the placement of the dredged material at the harbor's designated open-lake placement area. A contractor of the Federal government would accomplish the project. The type of equipment used to complete the maintenance dredging operation would be selected by the contractor performing the work. Dredging would not be performed during Lake Erie storm events. The project would take approximately 120 to 150 days to complete.

3 1.1.2 Minimum Degradation Alternative

This alternative would entail the dredging of an estimated 225,000 cubic yards of dredged material from the Federal navigation channels in 2016, with the placement of the dredged material at the harbor's designated open-lake placement area. A contractor of the Federal government would accomplish the project. The type of equipment used to complete the maintenance dredging operation would be selected by the contractor performing the work. Dredging would not be performed during Lake Erie storm events. This project would take approximately 90 to 120 days to complete.

4 1.2 Avoidance

The "No Action" alternative was considered but dismissed since it would not address the navigation needs of the harbor and substantial effects on commercial navigation and associated industries would occur as a result of this alternative. The overall value of the harbor as a water

resource to commercial navigation would progressively deteriorate to a point at which deep-draft commercial vessels would no longer be able to navigate the harbor due to inadequate depths. The large industrial base that depends on the harbor to transport commodities would no longer be able to do so cost-effectively. The harbor would no longer be a viable alternative for the transportation of goods. This would negatively impact the annual $215 million in direct revenue, over 1,170 direct, indirect, and induced jobs; and $60.1 million in personal income generated by the continued viability of the Harbor. If the harbor were closed to commercial traffic, commodities would have to be transported by rail and truck. This would increase annual emission rates by over 20,735 tons of harmful particulate matter (PM-10) and increase costs by $35,000 due to increased railroad related accidents, and $1,145,000 due to increased trucking related accidents. Losses of between three and four feet of channel depth would result in increased transportation costs of between $388,000 and $806,000 annually.

For any USACE civil works Operation and Maintenance (O&M) dredging project, federal regulations require USACE to select the least cost, environmentally acceptable dredged sediment management alternative that is engineeringly feasible. This is commonly referred to as the "Federal Standard." "Environmentally acceptable" within this definition means compliance with the Clean Water Act (CWA) Section 404(b)(1) Guidelines (if there is a discharge of dredged sediment into a water of the United States) and National Environmental Policy Act (NEPA). One major objective of the Federal Standard is to ensure that federal dredging funds across states are spent in an equitable manner and in a way that does not favor any particular state policy relating to dredged sediment management. The USACE is responsible for determining compliance with the CWA Section 404(b)(1) Guidelines and for complying with NEPA. While beneficial use of the dredged sediment is often preferred, the implementation of such alternatives usually requires non-USACE sponsorship and non-USACE cost contributions. When the discharge of dredged sediment is determined to meet CWA Section 404(b)(1) Guidelines, which includes compliance with applicable state water quality standards (WQSs), open-lake placement is often the least costly alternative and therefore the Federal Standard. CDF placement is often the least costly alternative for dredged sediment that has not been determined to meet CWA Section 404(b)(1) Guidelines for open-lake placement. When a state requires conditions or implementation of an alternative which the Federal Standard does not, a state or other entity may fund the difference in cost between the Federal Standard and preferred option.

5 <u>1.3 Minimization</u>

Note that the Minimum Degradation Alternative estimates dredging 275,000 cubic yards less than the Preferred Design Alternative. It is estimated that dredging activities specified in the Minimum Degradation Alternative will impact an estimated 46 acres (Enclosure 5), which is 57 acres less of channel bottom/habitat than the 103 acres that would be impacted under the Preferred Design Alternative (Enclosure 4). The estimated "length" of Federal navigation channel (i.e., not actually stream) to be dredged under the Preferred Design and Minimum Degradation Alternatives are 10,160 and 4,467 linear feet, respectively. Note that the actual shoal depths cannot be determined until just before the dredging begins. In addition, shoal thickness will vary throughout the harbor and greatly depend on weather conditions. Therefore,

the above figures are merely estimates regarding the acreage of Federal navigation channel to be dredged/impacted under either alternative.

6 1.4 Magnitude of the Proposed Lowering of Water Quality

The open-lake placement of dredged sediment is unlike other discharges regulated under the CWA as external sources of pollutants (i.e., point source wastewater discharges). The origin of dredged sediment that is open-lake placed is from within the aquatic ecosystem and therefore the sediment would be an internal source both prior to dredging and after being placed in the open-lake. In other words, it is not new to the aquatic system. Under existing formal guidance pursuant to CWA Section 404(b)(1) Guidelines, the sediment is thoroughly sampled and tested to demonstrate that it presents no significant increased risk to aquatic life or human health in comparison to the lake bottom sediments on which it is being placed. In a mechanical dredging operation, the sediment is excavated from the channel using a clamshell bucket, put into a scow and transported to the designated open-lake area where it is then discharged from a scow and released to the lake environs. The dredged sediment falls as a cohesive mass through the water column coming to rest on the lake bottom, typically as a mound with a mild slope. Generally, more than 95 percent of the sediment remains in the cohesive mass while less than five percent of it is suspended in the water. This suspended sediment results in short-term, localized turbidity which rapidly dissipates in the water column due to dispersion and settling. The turbidity fades to background conditions within about an hour time period. This temporary increase in turbidity is limited in spatial extent and typically remains within close vicinity of the point of discharge, well within the boundaries of the open-lake placement area. The sediment is thoroughly sampled and tested to ensure that contaminants are not released with the suspended sediments at concentrations that could be harmful to aquatic life and human health. After settling, the dredged sediment remains in-place along with the surrounding lake bottom sediments. While the newly deposited sediment is subject to lake bottom currents and waves, open-lake placement areas are selected to be relatively low-energy environments with low current velocities and low wave shear forces, offering little potential for erosion and resuspension. If any of the dredged sediment placed on the lake bottom is resuspended, it would still behave the same as the surrounding lake bottom sediments.

A comprehensive examination of sediment and water quality (contaminant)-related impacts associated with open-lake placement of sediment dredged from Lorain Harbor has been completed. The evaluation showed that Lorain Harbor sediments are physically and chemically comparable to open-lake reference area sediments and that based on the available information, open-lake placement of Lorain Harbor dredged sediment is not expected to cause unacceptable adverse, contaminant-related impacts. Open-lake placement of Lorain Harbor dredged material would comply with applicable water quality standards.

The main water quality-related impacts would be the generation of turbidity, variation of dissolved oxygen levels and release of contaminants to the water column during discharge, which would be short-term and spatially limited. Such impacts would be temporary and spatially limited, and be in compliance with applicable state WQSs for the protection of aquatic life. Turbidity associated with placement of dredged sediment at the open-lake placement areas would

not increase to an extent that it would result in any significant reduction of light penetration into the water column.

Placement of dredged sediment at the open-lake placement areas would result in the smothering and mortality of benthic macroinvertebrates, and the temporary avoidance of work areas during dredged sediment discharge operations by fish and wildlife species (i.e., mostly gulls and waterfowl). Following placement activities, benthic communities are expected to recolonize the impacted areas, and fish and wildlife would return. Open-lake placement would not significantly affect plankton. Open-lake placement areas are located to avoid any significant fish spawning areas. The fish community is generally adapted to natural levels of turbidity in the lake and open-lake placement of the dredged sediment would not significantly increase ambient turbidity levels over the long-term. Fishes may avoid or be attracted to open-lake placement events, or may not show any noticeable effect, and would return following the completion of dredging operations. While the aquatic ecosystems at typical open-lake placement areas are less biologically diverse and productive, they are resilient. The periodic disturbance created by open-lake placement of dredged sediment is absorbed or accommodated by the ecosystem because its structure and function would not fundamentally change to a different state. No effects to any listed Threatened or Endangered species would occur as a result of the open-lake placement of this dredged sediment.

1.5 Technical Feasibility and Cost Effectiveness

This alternative is technically feasible, as it involves routine maintenance dredging and dredged material placement procedures. Equipment is readily available to accomplish this type of work. The most recent benefit to cost (B/C) ratio for this alternative with respect to commercial navigation in the harbor is greater than or equal to 1. Costs of this project have ranged from $5.50 to $6.50 per cubic yard of dredged material over the past five years.

1.6 Economic Considerations

A large industrial base depends on the harbor to receive commercial goods and ship them off-site for a reasonable cost. As such, it would allow for the cost-effective transport of commodities through the local community. Maintaining the harbor would have a substantial positive impact on the local economy by sustaining jobs that support industries dependent on these shipments at reasonable cost. Lorain Harbor is ranked 28th among Great Lakes Ports with 2.05 million tons of material shipped or received between 2006 and 2010. Bulk commodities that pass through the Harbor generate approximately $84 million dollars annually in direct revenue which supports over 1,794 jobs. These jobs generate over $117 million per year in personal income. This industrial base also generates substantial tax revenues for state and local governments. Dredging operations would directly support about 5-10 marine trade jobs in the dredging industry for a period of about 90 days.

Substantial effects on commercial navigation and associated industries would occur as a result of not maintaining the harbor. The overall value of the harbor as a water resource to commercial

navigation would progressively deteriorate to a point at which deep-draft commercial vessels would no longer be able to navigate the harbor due to inadequate depths. The industrial base that depends on the harbor to transport commodities would no longer be able to do so costeffectively. The harbor would no longer be a viable alternative for the transportation of goods.
If the harbor were closed to commercial traffic, commodities would have to be transported by rail and truck. This would increase annual emission rates by over 20,735 tons of harmful particulate matter (PM-10) and increase costs by $35,000 due to increased railroad related accidents, and $1,145,000 due to increased trucking related accidents. Light loading; loss of between 3 and 4 feet of channel depth results in increased transportation costs of between $388,000 and $806,000 annually.

1.7 Cumulative Impact

The overall cumulative impact of the proposed project is considered to be socially and economically beneficial. The most substantial cumulative effect resulting from this project would be to facilitate continued unrestricted navigation which would benefit the associated upland industries within Lorain Harbor. Implementation of the proposed project would work toward sustaining the integrity of Lorain Harbor from economic and social perspectives. Dredged sediment management through open-lake placement would have minor, localized adverse short-term affects, most of which are related to water quality and the benthic community. However, the long-term socioeconomic benefits of this dredging on the region's socio-economic condition would far outweigh the temporary, localized minor adverse effects.

Past, present and reasonably foreseeable cumulative impacts relating to the discharge of dredged sediment include the consideration of dredged sediment discharge water quality-related impacts in tandem with other ongoing sources of contamination on water quality in the vicinity of the proposed placement areas. These impacts are described below.

The discharge of dredged sediment at the open-lake placement area would result in short-term, minor reductions of water quality in the receiving waters, as mainly associated with turbidity, variation of oxygen levels and release of contaminants resulting from the initial discharge. Such impacts would be temporary and spatially limited, and be in compliance with applicable state WQSs for the protection of aquatic life. Turbidity associated with dredged sediment placement would not increase to an extent that it would result in any significant reduction of light penetration into the water column.

Major sources of water pollution to Lake Erie include external air deposition and discharges from point (e.g., combined sewer overflows) and non-point source (land runoff) discharges, and internal flux from resuspended bottom sediment. The combined water quality impact from these discharges of dredged sediment with other sources of water pollution would be insignificant over the short- and long-term.

1.8 Construction Storm Water Management Plans

N/A

1.9 Post-Construction Storm Water Management Plans

N/A