# Appendix V

# Record of Decision

# Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site

# Statement of Findings: Floodplains and Wetlands

**Need to Affect Floodplains and Wetlands**

Onondaga Lake sediments are currently contaminated with mercury and other contaminants. Onondaga Lake lies within the 100-year floodplain, therefore, cleanup of the contaminated sediments, which pose a risk both to human and ecological receptors, may involve extensive remedial work within the floodplain adjacent to the lake. The selected remedy addresses all areas of the lake where the surface sediments exceed a mean probable effect concentration quotient (PECQ) of 1 or a mercury PEC of 2.2 milligrams per kilogram (mg/kg).[1] The selected remedy will also attain a 0.8 mg/kg bioaccumulation-based sediment quality value (BSQV) for mercury on an area-wide basis for the lake and for other applicable areas of the lake to be determined during the remedial design. The selected remedy is also intended to achieve lakewide fish tissue mercury concentrations ranging from 0.14 mg/kg, which is for protection of ecological receptors, to 0.3 mg/kg, which is based on EPA's methylmercury National Recommended Water Quality criterion for the protection of human health for the consumption of organisms. The major components of the selected remedy include:

- Dredging of as much as an estimated 2,653,000 cubic yards (cy) of contaminated sediment/waste from the littoral zone[2] in Sediment Management Units (SMUs)[3] 1 through 7 to a depth that will prevent the loss of lake surface area, ensure cap effectiveness, remove non-aqueous-phase liquids (NAPLs), reduce contaminant mass, allow for erosion protection, and reestablish the littoral zone habitat. Most of the dredging will be performed in the in-lake waste deposit (ILWD) (which largely exists in SMU 1) and in SMU 2.

- Dredging, as needed, in the ILWD to remove materials within areas of hot spots (to improve cap effectiveness) and to ensure stability of the cap.

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1 These cleanup criteria were developed to address acute toxicity to the sediment-dwelling (benthic) community in Onondaga Lake.

2 The littoral zone is the portion of the lake in which water depths range from 0 to 9 meters (m) (30 feet [ft]).

3 For investigation and remediation purposes, the site has been divided into eight SMUs based on water depth, sources of water entering the lake, physical and ecological characteristics, and chemical risk drivers. SMUs 1 through 7 cover the littoral zone and SMU 8 covers the profundal zone. (See Record of Decision Figure 3.)

- Placement of an isolation cap over an estimated 425 acres of SMUs 1 through 7.

- Construction/operation of a hydraulic control system along the SMU 7 shoreline to maintain cap effectiveness. In addition, the remedy for SMUs 1 and 2 will rely upon the proper operation of the hydraulic control system, which is being designed to control the migration of contamination to the lake via groundwater from the adjacent upland areas.

- Placement of a thin-layer cap over an estimated 154 acres of the profundal zone.[4]

- Treatment and/or off-site disposal of the most highly contaminated materials (e.g., pure phase chemicals segregated during the dredging/handling process). The balance of the dredged sediment will be placed in one or more Sediment Consolidation Areas (SCAs), which will be constructed on one or more of Honeywell's Solvay wastebeds that historically received process wastes from Honeywell's former operations. The containment area will include, at a minimum, the installation of a liner, a cap, and a leachate collection and treatment system.

- Treatment of water generated by the dredging and sediment handling processes to meet NYSDEC discharge limits.

- Completion of a comprehensive lakewide habitat restoration plan.

- Habitat reestablishment will be performed consistent with the lakewide habitat restoration plan in areas of dredging/capping.[5]

- Habitat enhancement will be performed consistent with the lakewide habitat restoration plan.

- A pilot study will be performed to evaluate the potential effectiveness of oxygenation at reducing the formation of methylmercury in the water column, while preserving the normal cycle of stratification within the lake. An additional factor which will be considered during the design of the pilot study will be the effectiveness of oxygenation at reducing fish tissue methylmercury concentrations. If supported by the pilot study results, the pilot study will be followed by full-scale implementation of oxygenation in SMU 8. Furthermore, potential impacts of oxygenation on the lake system will be evaluated during the pilot study and/or the remedial design of the full scale oxygenation system.

- Monitored natural recovery (MNR) in SMU 8 to achieve the mercury PEC of 2.2 mg/kg in the profundal zone and to achieve the BSQV of 0.8 mg/kg on an area-

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[4] The profundal zone is the portion of the lake in which water depths exceed 9 m (30 ft) within SMU 8.

[5] The design and construction of the remedy must meet the substantive requirements for permits associated with disturbance to state and federal regulated wetlands (e.g., 6 New York Code of Rules and Regulations [NYCRR] Part 663, Freshwater Wetlands Permit Requirements) and navigable waters (e.g., 6 NYCRR Part 608, Use and Protection of Waters).

wide basis within 10 years following the remediation of upland sources, littoral sediments, and initial thin-layer capping in the profundal zone. An investigation will be conducted to refine the application of an MNR model and determine any additional remedial measures (e.g., additional thin-layer capping) needed in the profundal zone.

- Investigation to determine the appropriate area-wide basis for the application of the BSQV of 0.8 mg/kg. During remedy implementation, additional remedial measures may be needed (e.g., thin-layer capping) to meet the BSQV on an area-wide basis.

- Implementation of institutional controls including the notification of appropriate government agencies with authority for permitting potential future activities which could impact the implementation and effectiveness of the remedy.

- Implementation of a long-term operation, maintenance, and monitoring (OM&M) program to monitor and maintain the effectiveness of the remedy.

NYSDEC and EPA have determined that there is no practicable alternative that is sufficiently protective of human health and the environment which would not result in the excavation and isolation capping of these sediments. Consequently, since remedial action is necessary, any remedial action that might be taken would necessarily affect floodplains and wetlands associated with Onondaga Lake. The following seven remedial alternatives were considered[6]:

- Alternative 1 – No Action

- Alternative 2 – Dredging for No Loss of Lake Surface Area and Erosion Protection and to Reestablish Habitat, and Isolation Capping in SMUs 1 to 7; Targeted Dredging to 4 m (13 ft) for NAPL Removal in SMU 2; Targeted Dredging in SMUs 3 and 6; and Phased Thin-Layer Capping, Oxygenation, and Monitored Natural Recovery in SMU 8.

- Alternative 3 – Dredging of the ILWD to 2 m (6.5 ft) and Isolation Capping in SMU 1; Dredging for No Loss of Lake Surface Area and Erosion Protection and to Reestablish Habitat, and Isolation Capping in SMUs 2 to 7; Targeted Dredging to 4 m (13 ft) for NAPL Removal in SMU 2; Targeted Dredging in SMUs 3 and 6; and Phased Thin-Layer Capping, Oxygenation, and Monitored Natural Recovery in SMU 8.

- Alternative 4 – Dredging of the ILWD to 2 m (6.5 ft); Removal in Areas of Hot Spots in the ILWD to a Maximum Depth of 3 m (10 ft) and Isolation Capping in SMU 1; Dredging for No Loss of Lake Surface Area and Erosion Protection and to Reestablish Habitat, and Isolation Capping in SMUs 2 to 7; Targeted Dredging to 9 m (30 ft) for NAPL Removal in SMU 2; Targeted Dredging in SMUs 3 and 6;

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6 Under Alternatives 2 through 6, all areas of the lake where the surface sediments exceed a mean PECQ of 1 or the mercury PEC (2.2 mg/kg) would be addressed. Under Alternative 7, all areas of the lake where the surface sediments exceed effects range-low (ER-L) values would be addressed.

and Phased Thin-Layer Capping, Oxygenation, and Monitored Natural Recovery in SMU 8.

- Alternative 5 – Dredging of the ILWD to 5 m (16.4 ft) and Isolation Capping in SMU 1; Dredging for No Loss of Lake Surface Area and Erosion Protection and to Reestablish Habitat, and Isolation Capping in SMUs 2 to 7; Targeted Dredging to 9 m (30 ft) for NAPL Removal in SMU 2; Targeted Dredging in SMUs 3 and 6; and Phased Thin-Layer Capping, Oxygenation, and Monitored Natural Recovery in SMU 8.

- Alternative 6 – Dredging for Full Removal (based on mean PECQ of 1 and the mercury PEC criteria) in SMUs 1 to 4, 6, and 7; Dredging for No Loss of Lake Surface Area and Erosion Protection and to Reestablish Habitat, and Isolation Capping in SMU 5; and Phased Thin-Layer Capping, Oxygenation, and Monitored Natural Recovery in SMU 8.

- Alternative 7 – Dredging for Full Removal (based on ER-L criteria) in SMUs 1 to 4, 6, and 7; Dredging for No Loss of Lake Surface Area and Erosion Protection and to Reestablish Habitat, and Isolation Capping in SMU 5; and Thin-Layer Capping and Oxygenation in SMU 8.

The No-Action alternative does not entail excavation or capping of contaminated sediments; under this alternative, no remedial actions would take place within delineated floodplains or wetlands. However, contaminated sediments in the lake would remain in place and would continue to be a potential source of contamination to the lake and its adjacent wetlands and floodplains. Consequently, the No-Action alternative would not be protective of human health and the lake environment. The implementation of any of the action alternatives would be more protective of human health and the environment than the no-action alternative (since they would, to varying degrees, meet the remedial action objectives [RAOs] and preliminary remediation goals [PRGs] for the littoral and profundal areas and would result in residual risks less than the no-action alternative), including the wetlands and floodplains adjacent to the lake; and all action alternatives would involve substantial actions within floodplains.

**Effects of Proposed Action on the Natural and Beneficial Values of Floodplains and Wetlands**

The RAOs for Onondaga Lake include the elimination or reduction of contaminant releases from the ILWD and other littoral areas, and from profundal sediments, all of which are located within the 100-year floodplain. Since the selected remedy will be expected to achieve the RAOs, sediments contaminated with mercury and other contaminants will no longer function as a source of contamination to wetlands and floodplains associated with Onondaga Lake. Furthermore, capping activities will not significantly alter the capacity of the floodplain, and should not result in any increase in downstream flooding events. Accordingly, it is anticipated that no long-term adverse effects to floodplain resources will result due to implementation of the selected remedy, since any short-term negative impacts to the natural or beneficial values associated with the lake bottom sediments, which are already compromised by existing contamination, will be more than compensated for by the long-term benefit to the Onondaga Lake ecosystem once these sediments are removed and/or capped. Further, the habitat reestablishment component of the selected remedy will also provide additional habitat value to the lake and shoreline through the installation of various substrate and vegetation on the cap surface. The details for habitat reestablishment (e.g., type and thickness of substrates and

vegetation) will be developed during the remedial design, based upon a comprehensive lakewide habitat restoration plan. These measures will serve to enhance floodplain resources associated with the Onondaga Lake bottom, as well as wetland resources associated with Onondaga Lake. It is not anticipated that the landward extent of the floodplain will be impacted by implementation of the selected remedy.

**Compliance with Applicable State or Local Floodplain Protection Standards**

Four New York State regulated wetlands occur along or near the lake's shoreline near the mouths of Harbor Brook (SYW-19), Ley Creek (SYW-12), and Ninemile Creek (SYW-10), and along the northwest shoreline of the lake (SYW-6) (See Record of Decision Figure 6). These areas are now being addressed as part of investigations taking place at other upland sites (i.e., the Ninemile Creek Dredge Spoils Area for state-regulated wetland SYW-6, Geddes Brook/Ninemile Creek for state-regulated wetland SYW-10, and the Wastebed B/Harbor Brook site for state-regulated wetlands SYW-12 and SYW-19).

The primary New York State standard for protection of freshwater wetlands applicable to the remediation is Environmental Conservation Law (ECL), Article 24, Title 7. For freshwater wetlands, 6 NYCRR Parts 662 through 665 regulate activities conducted in or adjacent to regulated wetlands. The selected remedy will comply with this standard.

The selected remedy will also comply with applicable or relevant and appropriate substantive requirements relating to floodplains and wetlands, including Executive Order 11988: Floodplain Management; Executive Order 11990: Protection of Wetlands, and 40 CFR Part 6, Appendix A. Accordingly, draft floodplains and wetlands assessments have already been prepared for the preferred remedy; these assessments will be refined as necessary during the remedial design process.

**Measures to Mitigate Potential Harm to the Floodplains and Wetlands**

Implementation of the selected remedy will entail excavation and capping of lake sediments, resulting in temporary physical disturbances to the wetlands and floodplains. Measures to minimize potential adverse impacts that cannot be avoided will be evaluated as part of and incorporated into the remedial design. Common practices include field demarcation of wetland/floodplain areas and implementation of soil/sediment erosion and/or resuspension control measures (e.g., installation of silt fencing, hay bales, hay/straw mulch, jute matting) to minimize impacts from construction activities. Furthermore, any impacts to wetlands will be mitigated in accordance with the lakewide habitat restoration plan.

Measures will also be employed during capping and dredging activities to prevent in-lake sediments that are resuspended during remediation activities from being transported to other parts of the lake or downstream of the lake during flooding events (100-year and 500-year storms). For example, silt curtains will be used during dredging activities to minimize the transport of resuspended sediments from the areas being dredged to other parts of the lake. In addition, monitoring will occur during both dredging and capping operations. Should this monitoring indicate that elevated levels of suspended sediments are being generated by dredging or capping operations, operations will be modified so as to reduce those levels. Possible actions that could be taken in this regard include slowing down the rate of sediment removal, changes to the depth of the dredge cut, modifications to movement of the dredge equipment, and cessation of dredging/capping activities.