NATURAL RESOURCE DAMAGES PREASSESSMENT SCREEN

for
Onondaga Lake
Onondaga County, New York

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I. INTRODUCTION, AUTHORITIES, AND DELEGATIONS

This determination addresses potential claims for damages to natural resources of Onondaga Lake and adjacent ecosystems authorized by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601 *et seq*., as amended; the Oil Pollution Act of 1990 (OPA), 33 U.S.C. § 2701 *et seq*.; and the Clean Water Act (CWA), 33 U.S.C. § 1251 *et seq*.. There is a reasonable probability that a successful claim for damages to natural resources within the Trusteeship of the U.S. Department of the Interior (DOI) and the State of New York (NYS) can be made based upon review of relevant information gathered as of this date.

The DOI has trusteeship over natural resources, including but not limited to, migratory birds and their supporting ecosystems (40 CFR Section 600(b)(2)). Trusteeship over certain DOI trust resources, such as resident fish and wildlife, is shared with NYS. NYS released a Preassessment Screen for Onondaga Lake in April 1991, to which the DOI was not a signatory.

This preassessment screen determination has been prepared by the DOI, in consultation with the NYS, as a trustee for natural resources under the authority of Section 107(f) of CERCLA, as amended, 42 U.S.C. § 9607(f), the National Contingency Plan, 40 CFR part 300, the DOI Natural Resource Damage Assessment (NRDA) regulations, 43 CFR part 11, and other applicable Federal regulations and directives which serve to designate Federal, State, and Tribal natural resource trustees and which authorize recovery of natural resource damages.

The first step in developing a natural resource damage claim is preparation of a preassessment screen. The purpose of a preassessment screen is to provide a review of readily available information on hazardous substance release and potential impacts of those releases on natural resources under the trusteeship of Federal and State authorities. The review should ensure that there is a reasonable probability of making a successful claim against the responsible parties for releasing hazardous substances to the environment. Specifically, the trustees have determined that:

(1) A release of a hazardous substance has occurred;
(2) Natural resources for which the trustees may assert trusteeship under CERCLA, OPA, or CWA have been or are likely to have been adversely affected by the release;
(3) The quantity and concentration of the released hazardous substance is sufficient to potentially cause injury to natural resources;
(4) Data sufficient to pursue an assessment are readily available or likely to be obtained at a reasonable cost; and
(5) Response actions carried out or planned do not or will not sufficiently remedy the injury to natural resources without further action.

II. INFORMATION ON SITE AND DISCHARGE OR RELEASE

A. Site History

Onondaga Lake

Onondaga Lake is approximately 4.5 miles long, 1 mile wide, and 3,000 acres in size. The average water depth is 36 feet. The lake is located in a largely urban area near the City of Syracuse, Onondaga County, New York (Figure 1). Onondaga Lake has been the recipient of over 100 years of Honeywell- (formerly Allied Signal)[1] related wastes, as well as industrial and municipal sewage discharges from the municipal sewer system and by combined sewer overflows (Metro facility). Other industries in the area have contributed contamination as well. The various sites and areas of concern consist of Honeywell and non-Honeywell sources and potential sources. The lake is heavily contaminated with mercury (estimated release of 165,346 lbs between the years 1946-70) and other compounds from industrial activities. The deposition of calcium carbonate on the lake bottom has severely impacted its habitat value, and the lake is nutrient enriched, resulting in oxygen only in the upper levels of the lake.

Onondaga Lake was placed on the National Priorities List (NPL) on December 16, 1994. Several sites have been listed as "sub-sites" of the Onondaga Lake NPL site. In addition to the lake, sub-sites include Honeywell LCP Bridge Street, Honeywell Semet Residue Ponds, Honeywell Wastebed B/Harbor Brook, Honeywell Willis Avenue, the Town of Salina Landfill, General Motors - former Inland Fisher Guide facility (GM-IFG), Ley Creek Deferred Media, the GM - Ley Creek Dredgings, and the Maestri No. 2 Site (Figures 2 and 3).

Current contaminant loads to the lake are primarily derived from Honeywell sites on the lake perimeter as well as in its vicinity, with surface water and groundwater pathways delivering much of the associated contamination to the lake. Dense non-aqueous phase liquid plumes at the Willis Avenue and Wastebed B/Harbor Brook sites also convey chemicals of concern (COC) to the lake.

Contaminants of concern being transported to the lake from the Honeywell facilities include, among others, mercury, BTEX (benzene, toluene, ethylbenzene, and xylenes) compounds, chlorinated benzenes, naphthalene and other polycyclic aromatic hydrocarbons (PAHs), and ionic wastes. Historically, the contaminants included a greater assortment at generally higher concentrations (TAMS and YEC 2002). Besides the Honeywell upland facilities on the lake perimeter and in the Ninemile Creek basin, recent and historical evidence documents the presence of Honeywell wastes within the lake itself which resulted from historical waste discharges to the lake (e.g., via the East Flume). This in-lake waste deposit is estimated to be over 10.9 yd thick, with a maximum reported thickness of 15.0 yd, representing over 3 million cubic yards of material. This material represents some of the most contaminated sediment contained within the lake. Evidence indicates ongoing re-release of contamination from the area

[1] Under Federal and state CERCLA statutes, environmental liability may be imposed on a parent corporation, successor entities, or even individual officers, directors, or shareholders.

suggesting that contaminants contained in the deposit are not sequestered from the lake. Its location in the littoral zone is considered to be relatively unstable, with the material subject to wind-driven re-suspension and bioturbation, among other re-release processes.

The lake was closed to fishing from 1970 until 1986 due to mercury contamination. In 1986 the lake was opened to catch and release fishing, however, NYS Department of Health (NYSDOH) issued health advisories for the lake; consumption advisories remain in effect. NYS has initiated an NRDA for the Onondaga Lake system, the DOI intends to coordinate its damage assessment activities with those of NYS. In addition, extensive efforts are underway by NYS, the United States Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers, local governments, and non-governmental organizations to restore Onondaga Lake. The DOI further intends to coordinate its restoration planning with these ongoing activities.

A Record of Decision (ROD) for the lake bottom sub-site was issued in July 2005 (NYSDEC 2005a). It is estimated that 2,653,000 cubic yards of sediment/waste will be dredged from the littoral zone of the lake and 425 acres of lake bottom capped. The cost of this portion of the remedy is about $450 million.

Remedial Investigation/Feasibility Studies (RI/FS) are presently being performed by the Potentially Responsible Party (PRP) at Geddes Brook/Ninemile Creek, General Motors Inland Fisher Guide, Harbor Brook/Wastebed B, Maestri No. 2, Niagara Mohawk (Erie Boulevard), Niagara Mohawk (Hiawatha Boulevard), Willis Avenue, and Willis Avenue Ballfield. It is anticipated that the RI/FS will be completed at all of these sub-sites by 2007.

Ley Creek

The Ley Creek Polychlorinated Biphenyl (PCB) Dredging sub-site consists of dredged spoils on the banks of Ley Creek over a section about 4,000 feet long. PCBs are the primary contaminant of concern and have been found in the creek sediments. Groundwater is also contaminated with PCBs. A Remedial Design/Remedial Action Order on Consent was executed by the NYS Department of Environmental Conservation on July 15, 1999. A 4,000-foot reach of stream bank containing dredge spoils has been remediated (NYSDEC 2004).

General Motors – Inland Fisher Guide

The GM plant sub-site was used for plating, buffing, forming, and finishing metal auto parts. The operations produced PCB-contaminated hydraulic oils, waste solvents, and PCB paint sludge. Hazardous wastes include PCBs, solvents, copper, nickel, and chromium. Surface water, groundwater, soils, and vegetation have been contaminated by waste spills and releases from the manufacturing operation. Several interim remedial actions have occurred on-site, including removing 26,000 tons of soil containing PCBs, capping an industrial landfill, and constructing a treatment pond and water treatment system (NYSDEC 2004).

LCP Bridge Street Facility

The LCP Bridge Street Facility sub-site is located approximately two miles west of Syracuse in the Village of Solvay, Town of Geddes, Onondaga County, New York. The 20-acre facility manufactured chlorine utilizing the mercury cell process. The facility was closed in 1989 when allegations were made that they had violated their wastewater permit. The sub-site has mercury contaminated soils, sediment, surface water, and groundwater. Contaminated groundwater may be migrating to the lake. The sub-site contains wetlands and includes the West Flume, which discharges to Geddes Brook, which discharges to Ninemile Creek, a tributary to Onondaga Lake. Fish samples from the waterway and wetland at the sub-site contained mercury, PCBs, and hexachlorobenzene. A ROD was issued on September 29, 2000, selecting a remedy for the LCP Bridge Street sub-site. The selected remedy includes excavation of contaminated sediments (greater than 0.2 ppm mercury) from the West Flume, on- and off-site treatment/disposal of contaminated soils and sediments, and construction of a cap, slurry wall, groundwater extraction, and on-site treatment system. In March 2002, NYS signed a Consent Order with Honeywell International, Inc., for performance of the design and construction of the selected remedy. Accelerated remedial activities, including excavation and relocation of the brine mud piles, excavation and off-site disposal of PCB-contaminated soils, and overpacking and off-site disposal of 6 deteriorated drums, was conducted in November 2003. The design was completed in summer 2004. In addition, a Consent Order to investigate groundwater contamination for a second operable unit of the LCP Bridge Street sub-site was signed by Honeywell International, Inc., and NYS in May 2002. It is anticipated that this RI/FS will be completed in late 2005 (NYSDEC 2000, 2005b).

Salina Town Landfill

The Town of Salina landfill sub-site, about 55 acres in size, was used for disposal of domestic, commercial, and industrial wastes. The landfill was closed to further operation in late 1982. Contaminants of concern include PCBs (Aroclor 1248), aluminum, barium, manganese, and cyanide. Aquatic habitats of concern at the sub-site include Ley Creek, drainage swales, and open water, emergent, and scrub shrub wetland habitats. Migratory birds, including warblers, finches, sparrows, and waterfowl including black duck (*Anas rubripes*) and common merganser (*Mergus merganser*) use the sub-site and Ley Creek. A draft RS/FS, dated May 2000, documents that birds are at risk from contaminants at the sub-site, particularly metals. There are also risks to soil invertebrates, potentially impairing the quality of the habitat for DOI trust resources. A Proposed Plan identifying a preferred remedy for the Salina Town Landfill sub-site was released for public comment in January 2003. The preferred remedy called for conveyance of the collected leachate and groundwater via the sanitary sewer system to the Onondaga County wastewater treatment plant. During the public comment period, Onondaga County indicated that it had a policy not to accept wastewater from inactive hazardous waste sites. After several months of negotiations, the Town of Salina was not successful in convincing the County to make an exception to the County's policy. It is anticipated that a remedy identifying an on-site wastewater treatment facility will be proposed in 2005 (NYSDEC 2004).

Semet Residue Ponds

The Semet Residue Ponds sub-site is located in the Town of Geddes, Onondaga County, New York, along the southern shore of Onondaga Lake. The sub-site includes five irregularly shaped ponds used from 1917 to 1970, and two areas built to contain leakage from the ponds. The ponds cover about 11 acres and have an estimated average depth of 20 feet. The ponds were used as depositories for organic-based manufacturing residues and other waste materials including fly ash and cinders, calcium carbonate rich wastes, tanks, and drums. The pond residue is acutely corrosive (pH less than 1) representing a significant risk to wildlife that might come into contact with the residue. There are also risks to terrestrial herbivores and vegetation. A ROD for the site was issued on March 28, 2002. The selected remedy included reuse of the Semet residue material and hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, a groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-site groundwater treatment (NYSDEC 2002, 2005b).

Maestri Property No. 2

This 9.5-acre site is located behind 756 State Fair Boulevard in the Town of Geddes, Onondaga County, New York. The site includes a land filled area adjacent to a wetland. The site is currently inactive but was formerly used for disposal of caustic coated mill scale which was generated by the Crucible Steel Company, Inc., in Solvay. Disposal of wastes at the site has resulted in contamination of site media including soil, groundwater, surface water, and sediment. A RI/FS is underway. In 2004, an interim remedial measure was performed at the site.

Primary contaminants at the site include chromium and barium. Investigations have determined that site operations have impacted site groundwater, as well as surface water and sediments in the adjacent wetland. Contamination of site media, including sediments in the adjacent wetland, presents a significant environmental threat (NYSDEC 2005b).

Willis Avenue

Allied Signal's Willis Avenue plant used a mercury cell process to produce chlorine, sodium hydroxide, and potassium hydroxide, discharging an aqueous waste stream containing mercury as part of normal operations. Groundwater is contaminated with benzene, toluene, xylene, naphthalene, and chlorobenzenes. Soil is also contaminated. The PRPs have completed a revised Screening Level Ecological Risk Assessment. A Supplemental Remedial Investigation is underway (NYSDEC 2004).

B. Contaminants of Concern

Hazardous substances released to Onondaga Lake include, but are not limited to the following: mercury, PCBs, lead, cadmium, chromium, nickel, benzene, chlorinated benzenes, toluene, xylene, PAHs, and pesticides, including aldrin and dichloro-diphenyl-trichloroethane (DDT).

Mercury is the primary contaminant of concern regarding trust resources. It is found in sediments throughout the lake, generally in excess of 1 ppm in surface sediment, with higher concentrations found in the Ninemile Creek delta and in sediments in the southwestern portion of the lake in an area known as "in-lake waste deposit" (ILWD). The southwestern portion of the lake also contains some of the highest concentrations of other chemicals such as BTEX, PCBs, PAHs, dioxins, and furans.

C. Potentially Responsible Parties

PRPs for Onondaga Lake, including the NPL sub-sites, include Honeywell, the Town of Salina, McKesson Environmental, Syracuse China, Vall's Dodge, General Motors, LCP Chemicals, Bristol Labs, Crouse-Hinds, Quanta Resources, and Crucible Steel.

D. Damages Excluded from Liability under CERCLA or CWA

The regulations at 43 CFR Part 11.24 provide that the Trustees must determine whether the damages being considered are barred by specific defenses or exclusions from liability under CERCLA or CWA. The Trustees have made such determinations and are not aware of any such defenses or exclusions from liability which would preclude the pursuit of a natural resource damages claim for this Site. These required determinations are as follows:

The Trustees have reviewed whether the damages: (i) result from the discharge or release were specifically identified as an irreversible and irretrievable commitment of natural resources in an environmental impact statement or other comparable environmental analysis, that the decision to grant the permit or license authorizes such commitment of natural resources, and that the facility or project was otherwise operating within the terms of its permit or license, so long as, in the case of damages to an Indian Tribe occurring pursuant to a Federal permit or license, the issuance of that permit or license was not inconsistent with the fiduciary duty of the United States with respect to such Indian Tribe; or (ii) and the release of a hazardous substance from which the damages have resulted have not occurred wholly before the enactment of CERCLA; or (iii) resulted from the application of a pesticide product registered under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. section 135-135k; or (iv) resulted from any other Federally permitted release, as defined in section 101 (10) of CERCLA; or (v) resulted from a release or threatened release of recycled oil from a service station dealer described in section 107(a)(3) or (4) of CERCLA if such recycled oil is not mixed with any other hazardous substance and is stored, treated, transported or otherwise managed in compliance with regulations or standards promulgated pursuant to section 3014 of the Solid Waste Disposal Act and other applicable authorities.

The Trustees have also reviewed whether the discharge meets one or more of the exclusions provided in section 311 (a)(2) or (b)(3) of the CWA.

The municipal wastewater treatment plant that discharges to Onondaga Lake is permitted through the State Pollutant Discharge Elimination System (SPDES). The County has been required to upgrade the facility, and numerous exceedences of SPDES limits have occurred. The

DOI is not aware at this time of any other actual defenses or exclusions from liability under applicable laws that would preclude initiating a natural resource damage assessment.

III. PRELIMINARY IDENTIFICATION OF RESOURCES POTENTIALLY AT RISK

A. Potentially Affected Resources

Unlike most waterbodies in urban areas, the lake does not have residences located on its shoreline, enhancing its value to fish and wildlife resources. Onondaga Lake is within the Atlantic flyway and provides habitat for a number of DOI trust species, including 112 species of birds during the breeding season, 70 over-wintering species, including bald eagle (*Haliaeetus leucocephalus*), and 15 waterfowl and 6 waterbird species (TAMS and YEC 2002, National Audubon Society 2005). Migratory shorebirds forage in the shallow water and mud flats along the lakeshore. Killdeer (*Charadrius vociferus*), spotted sandpiper (*Actitis macularia*), and other birds breed along the shoreline and near the lake. Waterfowl use the lake for nesting during the breeding season, and for feeding and resting during migration. Mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), wood duck (*Aix sponsa*), common tern (*Sterna hirundo*), and others breed along the lake shore. Waterfowl nest along the northwest shoreline of the lake and in marshes near the Ninemile Creek waste beds. Other DOI trust species present include tree swallow (*Tachycineta bicolor*), red-tailed hawk (*Buteo jamaicensis*), belted kingfisher (*Ceryle torquata*), osprey (*Pandion haliaetus*), great blue heron (*Ardea herodias*), double-crested cormorant (*Phalacrocorax auritus*), black duck, green-winged teal (*Anas crecca*), and redhead (*Aythya americana*).

Prior to the onset of industrial discharges, the lake supported a coldwater fishery with species such as Atlantic salmon (*Salmo salar*), cisco (*Coregonus artedii*), American eel (*Anguilla rostrata*), and burbot (*Lota lota*) (Auer *et al*. 1996). By 1927, a fishery survey reported that the coldwater fishery had been disturbed due to the impacts of soda ash production. The Onondaga Lake fishery is now characterized as a warmwater fish community dominated by the pollution-tolerant gizzard shad (*Dorosoma cepedianum*), freshwater drum (*Aplodinotus grunniens*), carp (*Cyprinus carpio*), and white perch (*Morone americana*). Sunfish are abundant in the littoral zone. The lake supports several important sportfish, including channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieui*), and walleye (*Stizostedion vitreum*). A total of 57 species have been recorded between 1927 and 1994.

Tams and YEC (2002) noted that the composition of the fish community in the lake varies seasonally, with migration between the Seneca River and the lake being an important contributor to the variability. One of the major changes in the fish community occurs during fall turnover, when concentrations of dissolved oxygen decline throughout the water column. Based on reduced catches conducted during fall turnover and a complimentary increase in Seneca River catches, it is likely that many fish leave the lake to avoid the stress of low dissolved oxygen concentrations (Auer *et al*. 1996). Species moving out of the lake include channel catfish, gizzard shad, white perch, and smallmouth bass. At present, 11 species e.g., bluegill (*Lepomis macrochirus*), banded killifish (*Fundulus diaphanus*), largemouth bass, yellow perch (*Perca flavencens*), are thought to breed in the lake (Auer *et al*. 1996). Additionally, one lake trout (*Salvelinus namaycush*) caught in Onondaga Lake was a tagged fish that was stocked in one of the Finger Lakes (Tango and Ringler, 1996). Species that are not known to reproduce in the lake

are dependant on other areas to maintain the population within the lake. A tagging study by Ringler *et al.* (1995) found that a number of fish migrated out of the lake and entered the Seneca River system. Tagged fish were found as far upstream as Baldwinsville on the Seneca River (6.2 mi [10 km] away) and as far downstream as Fulton on the Oswego River (15.5 mi [25 km] away).

The authors also used radio telemetry to follow fish movements during the fall turnover in 1991. Several fish were found to leave the lake and enter the Seneca River during the turnover period Ringler *et al*. (1995) concluded that the Seneca River is a corridor for fish movement into and out of Onondaga Lake. The authors also noted that these movements indicate that some fish with elevated chemical concentrations in tissue likely leave the lake and enter the Seneca River system.

Over 300 acres of wetland exist adjacent to Onondaga Lake and along tributaries to the lake, including approximately 320 acres of state wetlands that are either directly connected to Onondaga Lake or within its floodplain. Habitat types in the complex of wetland around the lake include forested wetlands, scrub-shrub wetlands, emergent wetlands, and floating aquatic vegetation. Additional smaller wetlands are found along its tributaries. These wetlands support birds as mentioned above, as well as amphibians, reptiles, and mammals, upon which birds and fish depend.

B. Impacts to Fish and Wildlife Resources

The Baseline Ecological Risk Assessment (BERA) for Onondaga Lake (TAMS and YEC 2002) evaluated the health of many ecological receptors in the lake, finding that all receptors are at risk due to exposure to contaminants and other stressors in the lake. The contaminants of concern include:

1. Mercury and other metals (arsenic, barium, cadmium, chromium, copper, selenium, vanadium)
2. Chlorinated benzenes
3. PAHs (polynuclear aromatic hydrocarbons)
4. BTEX (benzene, toluene, ethylbenzene, and xylenes)
5. PCBs (polychlorinated biphenyls)
6. DDT
7. PCDD/PCDFs (dibenzo-p-dioxin and polychlorinated dibenzofurans)

There are known injuries to ecosystems supporting migratory birds.

- Sediments from a number of sample locations in Onondaga Lake exhibit toxicity to amphipods and chironomids, and/or have reduced benthic macroinvertebrate diversity. Some sediment samples exhibited a complete lack of benthic macroorganisms. This toxicity is an injury to a biological resource in accordance with Title 43 CFR Part 11.62(f)(4)(i)(E). This impaired quality of the sediments as a result of contamination results in a reduction in the quality of the habitat for migratory birds.

- A study conducted by the State University of New York at Cortland (Ducey 1997) shows that the amphibian populations of Onondaga Lake are depauperate. Data collected since 1993 indicate that Onondaga Lake itself and any wetlands directly receiving lake water, appear not to support amphibian reproduction and exhibit reduced species richness (Ducey and Newman 1995, Ducey *et al.* 1998). This impaired quality of the ecosystem, as demonstrated by these data, results in a reduction in the quality of habitat for migratory birds, particularly those that use amphibians as a food source, such as herons.

There are suspected direct injuries to migratory birds.

- There are likely injuries to DOI trust resources, particularly piscivorous migratory birds, from contamination. These birds have been exposed to contaminants, particularly mercury, through the food chain pathway and are at risk from contaminants including methylmercury, antimony, lead, selenium, DDT and metabolites, dieldrin, endrin, lindane, PCBs, dioxins/furans, and hexachlorobenzene (TAMS and YEC 2002). Avian wildlife receptors at risk include mallard, belted kingfisher, great blue heron, osprey, common tern, and tree swallow.

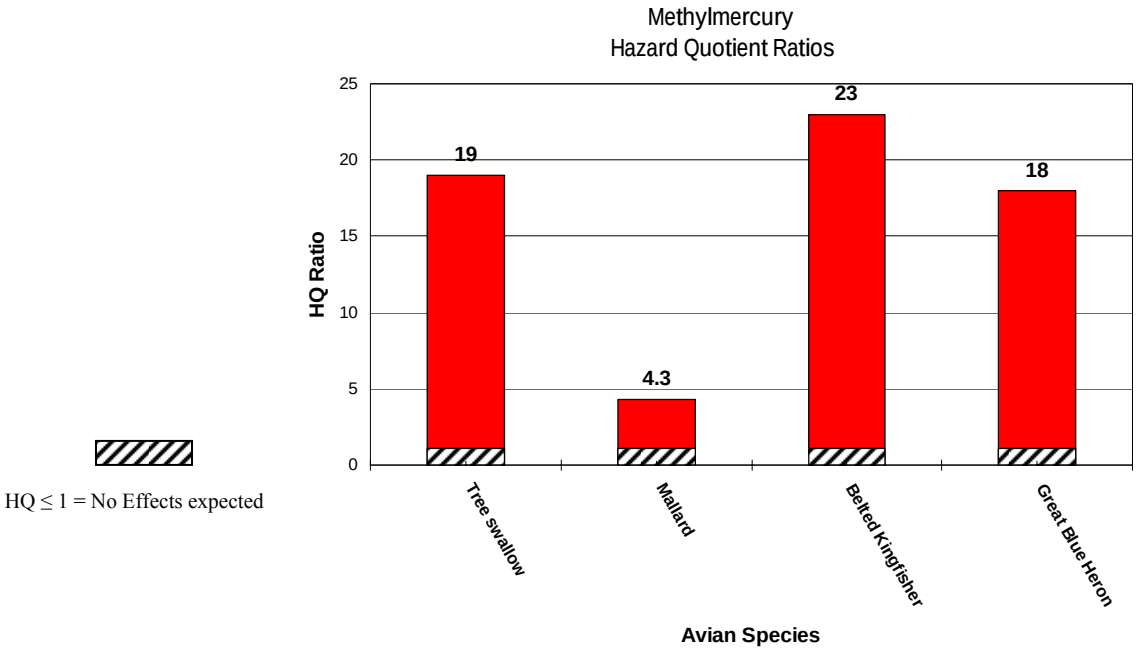
  As an example, mercury concentrations in Onondaga Lake in 1992 and 1999 exceeded the NYSDEC wildlife protection value of 0.0026 µg/L. Furthermore, mercury was evaluated (TAMS and YEC 2002) with a model to assess the potential risks based on a numerical comparison of an estimated exposure rate over a toxicity reference value to derive a hazard quotient (HQ) expressed as

  HQ = EER ÷ TRV where:

    EER (estimated exposure rate or dose) = an estimated amount of how much contaminant is taken in by a plant or animal, in terms of the body weight of the plant or animal (e.g., mg contaminant/kg body weight per day).

    TRV = toxicity reference value, usually the NOAEL (no observed adverse effects level), or the highest level of a chemical stressor in a toxicity test that did not cause harmful effects in a plant or animal.

  If the HQ $\geq$ 1, then harmful effects are likely due to the contaminant in question.



In addition to mercury, modeled dose concentrations of barium, cadmium, chromium, lead, mercury, selenium, zinc, and total PAHs for insectivorous birds had an HQ > 1. Modeled dose concentrations of barium, cadmium, chromium, zinc, dichlorobenzenes, dioxins/furans (TEQ), and total PAHs for waterfowl had an HQ > 1. For fish-eating birds, modeled HQs for total PAHs and total PCBs exposure were > 1 for the belted kingfisher and great blue heron, and total PCBs exceeded an HQ =1 for the osprey. Dioxins/furans (TEQ) exposure dose concentrations exceeded an HQ =1 for the belted kingfisher and was exceeded by modeled zinc exposure dose concentrations for the osprey. These results suggest the potential for adverse effects on piscivorous birds via exposure to COCs in water, sediment, and dietary sources.

Known service losses resulting from injuries to resident fish.

- Onondaga Lake was closed to public fishing in 1970 due to mercury contamination of fish. It remained closed to all fishing until 1986 when the lake was opened to catch and release fishing. At that time, the NYSDOH issued a health advisory to eat no fish caught in the lake or its tributaries to the first barrier impassable to fish. The advisory to eat no fish of any species from Onondaga Lake due to mercury contamination remained in effect until 1999. For the years 1999-2000 and 2000-2001, the advisory was to eat no walleye and for all other species eat no more than one meal per month, due to mercury. For 2001-2002, the previous advisories to eat no walleye and eat no more than one meal per month of all other fish species remained in effect, due to mercury contamination. Additionally, for 2001-2002, both dioxin and PCBs are now identified as COC in Onondaga Lake carp and channel catfish. Fish consumption advisories continue for the 2005-06 fishing season (NYSDOH 2005). These advisories are an injury to a biological

resource in accordance with Title 43 of the Code of Federal Regulations (CFR) Part 11.62(f)(1)(iii).

Mercury concentrations in fish from the lake exceed the current U.S. Food and Drug Administration (FDA) action level of 1.0 part per million (ppm). PCB concentrations in some fish from the lake have also exceeded the FDA tolerance of 2.0 ppm. This exceedence of action or tolerance levels established under section 402 of the Food, Drug and Cosmetic Act, 21 U.S.C. 342, in edible portions of organisms is an injury to a biological resource in accordance with Title 43 CFR Part 11.62(f)(1)(ii).

Much of the scientific information regarding adverse effects on ecological resources in Onondaga Lake has been summarized in a BERA that was finalized in December 2002 (TAMS and YEC). A strength-of-evidence approach was used to integrate different types of data, or lines of evidence used in this BERA to support a conclusion. The BERA contains an extensive collection of scientific references and data on impacts on lake biota. According to the BERA, the most recent observations of impacts to lake biota include:

- Reduced species richness and standing crop of macrophytes in the nearshore zone (Auer *et al*. 1996).
- Blooms of nuisance forms of cyanobacteria (i.e., blue-green algae) in the water column during summer (Auer *et al*. 1996).
- Increased oncolite density (Dean and Eggleston 1984).
- Reduced species richness of zooplankton communities (Auer *et al*. 1996).
- Dominance of benthic macroinvertebrate communities by pollution-tolerant taxa (Auer *et al*. 1996).
- Apparent lack of reproduction in the lake by numerous fish species (Auer *et al*. 1996).
- Change in fishery assemblage from a coldwater fishery to a warmwater fishery dominated by pollution-tolerant species (Tango and Ringler 1996).
- Mercury contamination of fish (NYSDEC 1987).
- Disappearance of fish from the lake during fall turnover (Auer *et al*. 1996).
- Reduced species richness of amphibians and reptiles (Ducey *et al*. 1998).
- Lack of amphibian reproduction in wetlands directly connected to lake water (Ducey 1997).
- Lack of spring turnover in the lake prior to 1987 (Owens and Effler 1996).

- Many if not all NOAEL and LOAEL TRVs for Onondaga Lake COC were exceeded for local insectivorous, piscivorous, and carnivorous birds and benthivorous waterfowl.

In summary, the BERA (TAMS and YEC 2002) concluded "multiple lines of evidence were used to evaluate major components of the Onondaga Lake ecosystem to determine if lake contamination has adversely affected plants and animals around the lake. Contaminants and stressors in the lake have either impacted or potentially impacted every trophic level and feeding preference examined…."

C. Exposed Areas

Areas presently identified into which significant quantities of hazardous substances have been released include Onondaga Lake, adjacent wetlands, streams including Ley Creek, Geddes Brook, Nimemile Creek, East Flume, West Flume, Onondaga Creek, Harbor Brook, and Tributary 5A, and the wetland and upland habitat associated with the sub-sites.

The Seneca River and connected water bodies (e.g. Cross Lake, Finger Lakes, Oswego River, and Lake Ontario) are potentially exposed areas due to the numerous mechanisms by which contaminants, (like mercury), can be transported from Onondaga Lake. The most likely mechanisms affecting other areas include volatilization, outflow to the Seneca River, removal/migration of fish from the lake via the Seneca River (TAMS and YEC 2002).

D. Preliminary Identification of Pathways

Probable Pathways

The following are probable pathways of transport:

1. Industrial wastewater discharge.

a) Industrial wastewater discharges from two chemical manufacturing plants (Bridge Street and Willis Avenue) have discharged mercury, calcium, and calcium salts, and other ionic wastes directly into the Onondaga Lake System. Between 1947 and 1970, Allied-Signal discharged an estimated 165,000 pounds of mercury in an aqueous waste effluent into Geddes Brook, Ninemile Creek, and directly into Onondaga Lake itself via a discharge known as the "West Flume."

b) Between 1882 and 1986, significant quantities of ammonia, calcium, calcium salts, and other ionic wastes were discharged into the Onondaga Lake System.

2. Groundwater.

Historically, the contribution of groundwater to Onondaga Lake has been assumed to be negligible (Effler and Driscoll 1986; Doerr *et al*. 1994). The Onondaga Lake

Management Conference (1994) concluded that "groundwater inputs and outputs to Onondaga [Lake] are probably a minor (<5 percent) component of the water budget." However, a review by NYSDEC/TAMS (1998) suggested that the estimated in-flow of groundwater was made without the benefit of any site-specific data. Therefore, although the inflow of groundwater to the lake might be a relatively small component of the Onondaga Lake water budget, groundwater flow represents an important means for contaminant migration, including mercury and organic compounds, to the water column. Examples of contaminated groundwater sources to the lake include (TAMS and YEC Inc. 2002a):

a) Lagoons containing wastes from the production of chlorinated benzenes were created on the shore of Onondaga Lake near the Allied-Signal Willis Avenue Plant. These lagoons contain millions of gallons of waste. The groundwater below these lagoons has been shown to contain benzene, toluene, xylenes, chlorinated benzenes, and PAHs, which are believed to be discharged via the groundwater into Onondaga Lake.

b) Groundwater below approximately 1,400 acres of Solvay waste beds contains elevated concentrations of calcium, calcium salts, and other ionic wastes. It is estimated that significant quantities of calcium, calcium salts, and other ionic wastes are discharged via groundwater from these waste beds into the Onondaga Lake System.

c) The groundwater beneath the Willis Avenue site contains elevated levels and free product of benzene and chlorobenzenes, which are believed to be discharged via groundwater to Onondaga Lake.

d) The groundwater beneath the Bridge Street Plant contains elevated levels of mercury. This groundwater discharges to Geddes Brook and Ninemile Creek, which discharges into Onondaga Lake.

3. Surface water runoff.

As noted above, extensive areas of wastes exist on land adjacent to the Onondaga Lake system. Calcium, calcium salts, and other ionic wastes are discharged via surface water runoff from the waste beds to Geddes Brook, Ninemile Creek, and Onondaga Lake. The lake has been heavily influenced primarily by Honeywell's (and its predecessor companies) industrial sources of Solvay waste since 1890.

The terminus of several tributaries on the south and west sides of Onondaga Lake border several current and former Honeywell Solvay Wastebeds, specifically:

. Ley Creek borders Solvay Wastebeds L and H.
. Onondaga Creek borders Solvay Wastebeds G, H, J, K, and M.
. Harbor Brook borders Solvay Wastebeds B, D, and E.
. Tributary 5A borders Solvay Wastebed A.
. Ninemile Creek borders Solvay Wastebeds 1 through 15.

The current major source of industrially contaminated surface water entering the lake is Ninemile Creek. Ninemile Creek receives much of its contaminants from Honeywell Wastebeds 1 through 15 (TAMS and YEC 2002).

Tributary 5A receives process water from the Crucible Materials Corporation plant, as well as surface runoff and shallow groundwater from Honeywell's Wastebed A, Willis Avenue, and Semet Residue Ponds sites and the Church and Dwight facility.

The East Flume is an excavated drainage ditch that runs through Wastebed B and receives stormwater from the Village of Solvay; process waters from General Chemical Corp. and Salt City Energy Venture, L.P.; historic releases from Honeywell's plant.

4. Food chain pathways – bioaccumulation.

A number of contaminants found in the sediment, water, and biota of Onondaga Lake samples tend to bioaccumulate. As an example, it is evident from a bioaccumulation study (PTI 1993) that mercury accumulates in phytoplankton and can be passed on to animals feeding on phytoplankton in Onondaga Lake to levels injurious to living resources. A conclusion of the BERA (TAMS and YEC 2002) has already been stated "…multiple lines of evidence were used to evaluate major components of the Onondaga Lake ecosystem to determine if lake contamination has adversely affected plants and animals around the lake. Contaminants and stressors in the lake have either impacted or potentially impacted every trophic level and feeding preference examined…."

E. Exposed Water Estimates

All of the area and volume of Onondaga Lake and a majority of its tributaries are believed to have been exposed to contaminants.

Surface Water –

Numerous COCs detected in lake surface water in 1992 and 1999 exceeded NYSDEC and EPA water quality standards, criteria, and guidance. The frequency of exceedances in Onondaga Lake and tributary water varied by contaminant, year, location, and depth, but with the exception of mercury, all COCs (i.e., barium, copper, lead, manganese, zinc, chlorobenzene, dichlorobenzenes, trichlorobenzenes, and bis[2-ethylhexyl]phthalate) exceeded EPA chronic aquatic or Tier II water quality criteria. Mercury concentrations in nearly all Onondaga Lake water samples in 1992 and 1999 exceeded the NYSDEC mercury wildlife protection values of 0.0026 µg/L (TAMS and YEC 2002)

F. Exposed Biota Estimates and Concentrations

Biotic resources that may have been affected by Onondaga Lake contamination include a wide variety of benthic invertebrates, amphibians, fish, birds, and mammals. An analysis of ecological exposure of contaminant concentrations in various media in Onondaga Lake were

determined as part of the BERA (TAMS and YEC 2002). Examples of contaminant levels in the various media include:

Plankton and Zooplankton –

Methylmercury concentrations for phytoplankton, on a wet-weight basis, ranged from 4.3 to 39 μg/kg, and total mercury concentrations ranged from 85 to 300 μg/kg. Methylmercury concentrations for zooplankton, on a wet-weight basis, ranged from 21 to 184 μg/kg in combined zooplankton assemblages and 165 to 390 μg/kg in daphnids. Total mercury concentrations for zooplankton, on a wet-weight basis, ranged from 23 to 247 μg/kg in assemblages and 247 to 994 μg/kg in daphnids.

Benthic Macroinvertebrates –

Total mercury and methylmercury were analyzed in benthic macroinvertebrates collected in Onondaga Lake in 1992 and 2000. Benthic organisms sampled in 1992 consisted of chironomids and amphipods. Benthic organisms sampled in 2000 consisted of chironomids, amphipods, and oligochaetes.

Total mercury was detected in all samples collected in 1992, with concentrations ranging from 268 to 2,500 μg/kg dry weight (dw). Methylmercury was detected in all samples collected in 1992, with concentrations ranging from 66 to 670 μg/kg dw.

In samples collected in 2000, all but one contained total mercury with concentrations ranging from 187 to 53,200 μg/kg dw. Methylmercury was detected in 35 of 41 samples, with concentrations ranging from 17 to 2,500 μg/kg dw. The maximum concentrations for both mercury and methylmercury were detected in the in-lake waste deposit between the East Flume and Harbor Brook. Total mercury concentrations were also elevated at Station S344 (35,500 μg/kg dw in an oligochaete sample) and at Station S404 (20,300 μg/kg dw in an oligochaete). These two stations are also in the vicinity of the East Flume and the Honeywell in-lake waste deposit.

Fish –

Mercury concentrations in fish from the lake exceed the current FDA action level of 1.0 ppm. PCB concentrations in some fish from the lake have also exceeded the EPA tolerance of 2.0 ppm.

Based on lake sampling, lipid-normalized methylmercury was detected in all Onondaga Lake fish sampled in 1992. The breakdown by species for the 1992 wet-weight fillet data is as follows:

. Bluegill: 0.05 - 0.92 mg/kg.
. Carp: 0.04 - 0.80 mg/kg.
. Channel catfish: 0.30 - 1.05 mg/kg.
. Gizzard shad: 0.07 - 0.38 mg/kg.

. Smallmouth bass: 0.26 - 1.72 mg/kg.
. Walleye: 0.30 - 3.17 mg/kg.
. White perch: 0.20 - 2.04 mg/kg.

Total mercury, rather than methylmercury was analyzed in the samples collected by Honeywel1/Exponent in 2000. Although a direct comparison of the two sets of data is not possible, the results of the analyses should be similar, because nearly all of the mercury in fish tissue consists of methylmercury.

Mercury was present in fish fillets of all species sampled in 2000 in Onondaga Lake fish with concentrations ranging from 0.23 to 1.89 mg/kg wet weight. The breakdown by species for the 2000 wet-weight fillet data is as follows:

. Bluegill: 0.23 - 0.44 mg/kg.
. Carp: 0.38 - 0.90 mg/kg.
. Channel catfish: 0.54 - 0.66 mg/kg.
. Largemouth bass: 0.30 - 1.89 mg/kg.
. Smallmouth bass: 0.41 - 1.53 mg/kg.

Mercury was detected in juvenile (young-of-year) fish sampled in 2000 at tributary mouths on a wet-weight basis, as follows:

. Bluegill: 0.05 - 0.22 mg/kg.
. Largemouth bass: 0.08 - 0.16 mg/kg.
. Pumpkinseed (*Lepomis gibbosus*): 0.05 - 0.14 mg/kg.

PCBs –

PCBs were detected in all receptor species analyzed by NYSDEC from 1992 and 2000, and by Honeywell in 2000. PCB concentrations ranged as follows:

. Bluegill: 0.30 - 0.88 mg/kg.
. Carp: 0.50 - 9.8 mg/kg.
. Channel catfish: 0.78 - 6.0 mg/kg.
. White perch: 0.37 - 3.8 mg/kg.
. Smallmouth bass: 0.21 - 11 mg/kg.
. Largemouth bass: 0.075 - 2.8 mg/kg.
. Walleye: 0.66 - 7.8 mg/kg.

A more extensive and complete description of contaminant levels in the various lake media are presented in Chapter 8 of the BERA (TAMS and YEC 2002).

IV. PREASSESSMENT SCREEN CRITERIA

Title 43 CFR Part 11.23(e) notes the five criteria that must be met before proceeding with a natural resource damage assessment. The criteria are as follows:

- A discharge of oil or a release of a hazardous substance has occurred.

- Natural resources for which a State or Federal or Indian tribe may assert trusteeship under CERCLA have been or are likely to have been adversely affected by the discharge or release.

- The quantity and concentration of the discharged oil or released hazardous substance is sufficient to potentially cause injury, as that term is used in this part, to those natural resources.

- Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost.

- Response actions, if any, carried out or planned do not or will not sufficiently remedy the injury to natural resources without further action.

These criteria are satisfied for the releases of hazardous substances covered by this preassessment screen, as follows:

Criteria #1: Discharges of oil and releases of hazardous substances have occurred.

There have been releases of hazardous substances, as defined by CERCLA. Hazardous substances which have been released into Onondaga Lake include, but are not limited to, the following:

1. Mercury and other metals (arsenic, barium, cadmium, chromium, copper, selenium, vanadium)
2. Chlorinated benzenes
3. PAHs (polynuclear aromatic hydrocarbons)
4. BTEX (benzene, toluene, ethylbenzene, and xylenes)
5. PCBs (polychlorinated biphenyls)
6. DDT
7. PCDD/PCDFs (dibenzo-p-dioxin and polychlorinated dibenzofurans)

These are listed as hazardous substances in Federal Regulations at 40 CFR 302.4, pursuant to Section 102(a) of CERCLA and Section 311 of the Federal Water Pollution Control Act. These substances have been released into the geographic area of concern from the sources described and adjacent ecosystems, and injured DOI and NYS trust resources.

Criteria #2: Natural resources for which the DOI may assert trusteeship under CERCLA have been or are likely to have been adversely affected by the release.

Trusteeship for migratory birds and their supporting habitats is clear under the Migratory Bird Treaty Act, and evidence to date suggests the likelihood of direct toxicological injury to birds. Aquatic ecosystems within the general jurisdiction of the United States and which support

migratory birds likewise appear to have been injured. Recreational losses resulting from injuries to resident fish have been assessed by NYS. Trusteeship also potentially stems from impacts to anadromous fish and Federally-listed endangered and threatened species. Onondaga Lake, although currently a warmwater fishery, was historically a coldwater fishery, containing ciscoes and Atlantic salmon.

Bald eagle (*Haliaeetus leucocephalus*) are known to occur in the Onondaga Lake area during the winter months. Eagles use openwater areas during the winter months for foraging which exposes eagles to site-related contaminants through the food chain pathway.

The Indiana bat (*Myotis sodalis*), a federally-listed endangered species, occurs within foraging distance from its hibernaculum and roosting sites located in Onondaga County. Bats foraging in Onondaga Lake habitats would be exposed to site-related contaminants through the food chain pathway.

Criteria #3: The quantity and concentration of the released hazardous substance is sufficient to potentially cause injury to those natural resources.

Injury is defined as a measurable adverse change, either long- or short-term, in the chemical or physical quality or the viability of a natural resource resulting either directly or indirectly from exposure to a discharge or release of a hazardous substance, or exposure to a product of reactions resulting from such discharge or release.

In Onondaga Lake, the quantity and concentration of released hazardous substances have injured natural resources of the assessment area. Documented injuries to the natural resources of the assessment area include: 1) NYS human health consumption advisories for various fish species from the assessment area; 2) exceedences of FDA action levels for fish; 3) adverse changes in the viability of biological resources, including a lack of or reduction in fish reproduction; and 4) toxicity of certain sediments to benthic organisms, as documented in studies of Onondaga Lake (Effler 1996; TAMS and YEC 2002). These injuries are discussed below in greater detail. These biological responses meet the acceptance criteria for injury in accordance with Title 43 CFR Part 11.

Fish consumption advisory and recreational fish closures:

Onondaga Lake was closed to public fishing in 1970 due to mercury contamination of fish. It remained closed to all fishing until 1986 when the lake was opened to catch and release fishing. At that time the NYSDOH issued a health advisory to eat no fish caught in the lake or its tributaries to the first barrier impassable to fish. The advisory to eat no fish of any species from Onondaga Lake due to mercury contamination remained in effect until 1999. For the years 1999-2000 and 2000-2001, the advisory was to eat no walleye and for all other species eat no more than one meal per month, due to mercury. For 2001-2002, the previous advisories to eat no walleye and eat no more than one meal per month of all other fish species remained in effect, due to mercury contamination. Additionally, for 2001-2002, both dioxin and PCBs are now identified as COC in Onondaga Lake carp and channel catfish. Fish consumption advisories continue for the 2005-06 fishing season. Current health advisories by the NYSDOH (2005) for

Onondaga Lake and its tributaries to the first barrier impassable by fish are: No fish from these waters should be eaten by women of childbearing age, infants, and children under the age of 15. For other persons, the advisories are:

Species	Advisory	Chemical(s) of Concern
Walleye	Eat none	Mercury
Carp, channel catfish and white perch	Eat no more than one meal per month	Mercury, Dioxin, PCBs
All other species	Eat no more than one meal per month	Mercury

Additionally, research regarding effects of contaminants on human health indicates there is increasing reason to be concerned about human consumption of contaminated fish. Specifically, Lonky *et al*. (1996) found behavioral effects in neonates whose mothers ate high amounts of Lake Ontario fish. Jacobson and Jacobson (1996), in studying children born to women who had eaten Lake Michigan fish, found that prenatal exposure to PCBs was associated with lower full-scale and verbal IQ scores after controlling for potential confounding variables such as socioeconomic status. Such considerations may in the future result in a further expansion and strengthening of fish consumption advisories for Onondaga Lake.

Recreational fishing and the viability of the commercial sport fishing industry in the assessment area have been impaired by the health advisories limiting or banning the consumption of a number of fish species. A recent report on the effects of the health advisory and advisory changes on fishing habits and fish consumption in New York sport fisheries found evidence of fish consumption suppression in New York anglers, as 47% of these people indicated they would eat more sport-caught fish if contaminant problems did not exist (Connelly *et al.* 1992).

Damages associated with lost recreational fishing use in Onondaga Lake are significant, due to the fishing closure and consumption advisory. NYS has completed a Recreational Impacts Assessment as the focus of its NRDA, the claim for which has been referred to the State's Office of the Attorney General.

Exceedences of FDA action levels for fish:

Levels of contaminants in fish species from Onondaga Lake have exceeded applicable FDA action levels. An FDA action level is an enforceable regulatory limit for unavoidable chemical residues in or on a food. FDA action levels consider factors other than human health concerns. Such factors include economic considerations and analytical detection limits. For these reasons, it not necessarily appropriate to infer that human health will not be adversely affected when contaminant residues are below FDA levels.

Furthermore, the Federal Food, Drug and Cosmetic Act authorizes EPA to set tolerances for pesticides in raw agricultural commodities, including fish or shellfish. EPA tolerances are enforceable standards specifying the maximum amount of a pesticide that can be legally present in or on the commodity.

The FDA action level for mercury is 1 ppm and the EPA tolerance for PCBs is 2 ppm. Mercury concentrations in fish from the lake exceed the current FDA action level of 1.0 ppm. PCB concentrations in some fish from the lake have also exceeded the EPA tolerance of 2.0 ppm. The exceedence of action or tolerance levels established under section 402 of the Food, Drug and Cosmetic Act, 21 U.S.C. 342, in edible portions of organisms is an injury to a biological resource in accordance with Title 43 CFR Part 11.62(f)(1)(ii).

Adverse changes in the viability of biological resources, fish population effects:

Fish population effects:

Compared to fish populations in other lakes in the area, many of the fish species in Onondaga Lake do not reproduce. Only 16 of 48 species captured in 1991 are known to have reproduced in the lake. Due to the lack of juvenile fish in samples collected along the shoreline, walleye and northern pike are thought not to reproduce in the lake (Auer *et al*. 1996). Reduced fish reproduction is an injury pursuant to Title 43 CFR Part 11.62(f)(4)(v)(E).

Toxicity of sediments to benthic organisms:

Impairment of the benthic community exists in the littoral zone (less than 5 m depth) of Onondaga Lake and the mouths of its tributaries (TAMS and YEC 2002; Auer *et al*. 1996). Levels of arsenic, cadmium, chromium, lead, mercury, nickel, dichlorobenzenes (total), trichlorobenzenes (total), ethylbenzene, toluene, xylenes, hexachlorobenzene, total PAHs, phenol, dibenzofurans, chlordanes, heptachlor/heptachlor epoxide, DDT and metabolites, total PCBs, and dioxins/furans found in sediment collected in 2000 exceeded numerous sediment criteria and/or guidance values for the protection of aquatic organisms.

The majority of moderately and severely impacted communities were located between Tributary 5A and Ley Creek; the most severely impacted benthic invertebrates being located between Tributary 5A and Onondaga Creek. Toxicity tests conducted in 1992 and 2000 confirm that Onondaga Lake sediments are toxic to benthic invertebrates and increase mortality and reduce growth and fecundity of these organisms (TAMS and YEC 2002). This is an injury pursuant to Title 43 CFR Part 11.62(f)(4)(i)(E).

Criteria #4: Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost.

Data sufficient to pursue an assessment can be obtained at a cost that is substantially less than the anticipated monetary damage amount. A large database exists regarding Onondaga Lake and the levels, sources, and impacts of contaminants. There is an extensive body of information regarding Onondaga Lake and its sub-sites.

Onondaga Lake has been the subject of intensive study for many years. Much of the research on the lake, with the exception of recent remedial investigations (RIs), has been summarized in a report titled, "The State of Onondaga Lake," which was prepared for the Onondaga Lake Management Conference (OLMC) by the Upstate Freshwater Institute (OLMC 1994) and in the text Limnological and Engineering Analysis of a Polluted Urban Lake, edited by Effler (1996). The report and book summarize studies on the hydrogeologic setting; tributaries and discharges; hydrodynamics and transport; and chemistry, biology, optics, sediments, and mechanistic modeling of water in Onondaga Lake.

Investigations performed as part of the Onondaga Lake RI (OLRI) (TAMS and YEC 2002) focused on COC that may be attributed to Honeywell operations in the area of the site, as well as to other non-Honeywell sources. The RIs for the Semet Residue Ponds, the Willis Avenue site, the LCP Bridge Street site, Wastebed B/Harbor Brook site, the Willis Avenue Ballfield site, and Geddes Brook/Ninemile Creek also considered the impact of Honeywell operations in the area of the site. The OLRI report relies primarily on data acquired by Honeywell and NYSDEC and submitted in data reports described in Table 1-2 of the report. Other data sources considered for the RI were also included in the table.

Additionally, Honeywell conducted a BERA, which was subsequently amended by the NYSDEC (TAMS and YEC 2002), with information on sources of pollution to the lake including hazardous waste sites and tributaries with contaminated sediments, and their probable effects on living resources in the lake. The availability of all this information will facilitate preparation of the Assessment Plan and conducting an Assessment, thereby reducing associated costs.

Criteria #5: Response actions, if any, carried out or planned do not or will not sufficiently remedy the injury to natural resources without further action.

Response actions will not sufficiently remedy the potential injury. Activities anticipated as part of the EPA remedial process will not address interim lost use, or the injuries and lost services from the time of release, or necessarily ensure a return to baseline. The response actions for the site are primarily directed towards control and removal of contaminants at most of the delineated sediment management units within defined geographic limits, but the majority of lake contaminated sediment will be addressed through monitored natural recovery to a mercury level above the NOEL (no observable effects level) and LOEL (lowest observed effects level) of many

sensitive endpoints. Furthermore, contaminants may have migrated considerable distances from the site via the outlet to the Seneca River, and no response actions directed at the Seneca River, its sediments, or biota are planned. In general, response actions at the Onondaga Lake NPL sites will fail to address the cumulative ecosystem impacts of the contaminants in Onondaga Lake, particularly residual contamination of the sediments and the bioaccumulation in biota.

V. PREASSESSMENT SCREEN DETERMINATION

Based on the information contained in this Preassessment Screen, I have determined that it is appropriate to conduct a natural resource damage assessment for Onondaga Lake.

Marvin Moriarty
Regional Director
Authorized Official
U.S. Fish and Wildlife Service
Department of the Interior

Date: 2-27-06

Mark Barash
Regional Solicitor
Office of the Solicitor
Department of the Interior

Date: 9/25/06

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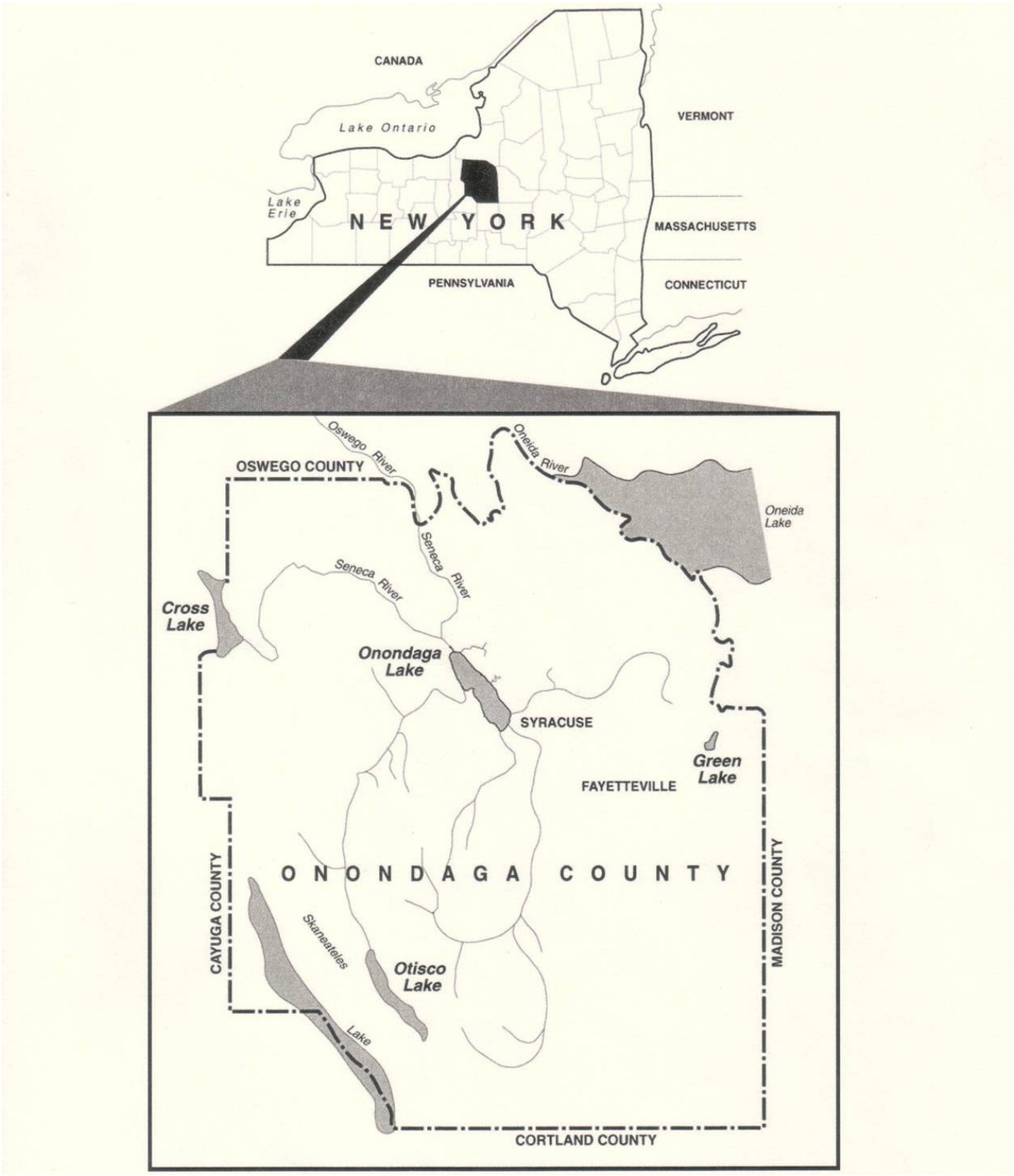

Figure 1. Location of Onondaga Lake within the local geographical area.
Source: Parsons 2004.

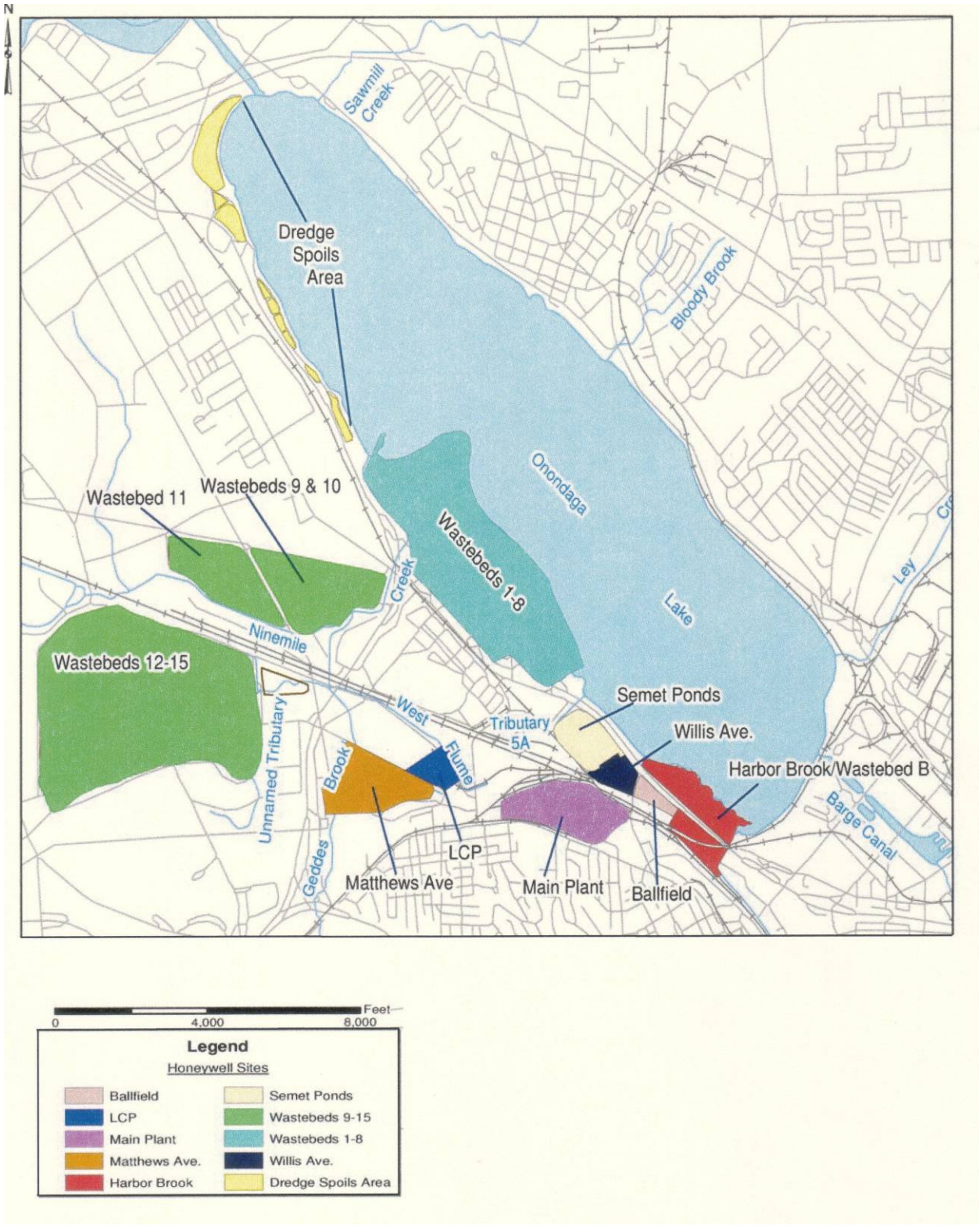

Figure 2. Location of former Honeywell facilities and disposal areas near Onondaga Lake

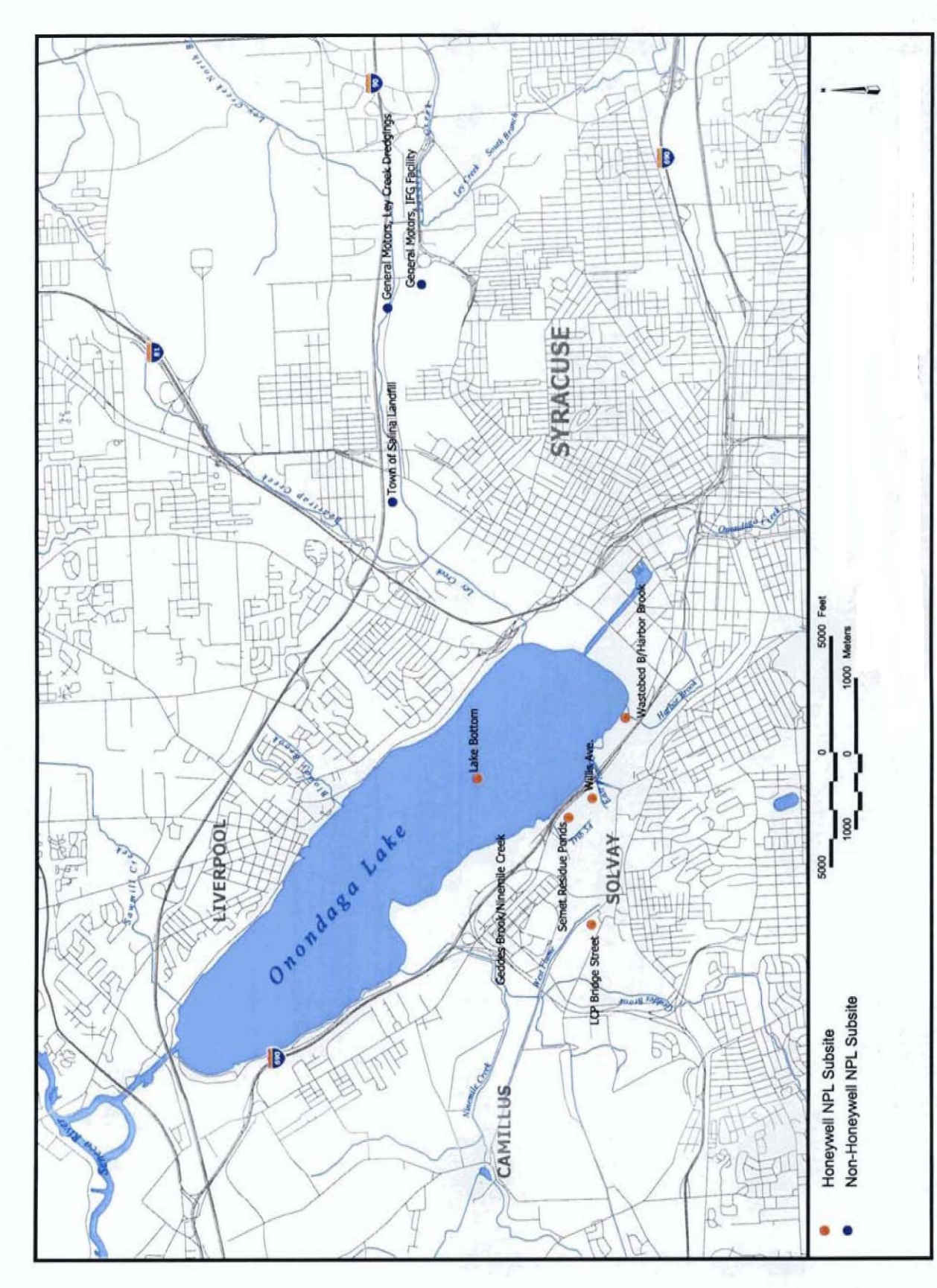

Figure 3. Locations of Onondaga Lake NPL Subsites.