CITIZENS CAMPAIGN
FOR THE ENVIRONMENT

Protecting the environment and working for a healthy world.

225A Main Street • Farmingdale, New York 11735
Tel: 516-390-7150 • Fax: 516-390-7160
199 Main Street, Suite 319 • White Plains, New York 10601
Tel: 914-997-0946 • Fax: 914-997-0983
170 Washington Ave., 3rd Floor • Albany, New York 12210
Tel: 518-434-8171 • Fax: 518-434-8172
3144 Main Street • Buffalo, New York 14214
Tel: 716-831-3206 • Fax: 716-831-3207
466 Westcott Street, 2nd Floor • Syracuse, New York 13210
Tel: 315-472-1339 • Fax: 315-472-1179

November 29, 2004

Commissioner Erin Crotty
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233

6-5

DEC - 2 2004

Dear Ms. Crotty,

RE: CCE Request for Additional Public Hearings for the Onondaga Lake Remediation Plan

Citizens Campaign for the Environment (CCE) is an 80,000 member, not-for-profit, non-partisan advocacy organization working to protect public health and the natural environment throughout New York State and Connecticut. CCE operates from five regional offices across New York State and interacts with New York and Connecticut residents to advance sound environmental policies throughout the year.

CCE congratulates the Department staff that worked so hard on preparing the proposed clean up plan for Onondaga Lake. We look forward to reviewing and offering input to this important document. 1
CCE commends the Department's decision to extend the public comment period to ninety days; however, we believe the single public meeting scheduled for January 12, 2005 is insufficient. **CCE is respectfully requesting that the Department add at least two additional public hearings scheduled during the month of February.**

It is our view that it is paramount to rigorously involve and engage the public during the public comment period. CCE believes the one public hearing shortchanges the public comment process, especially following the busy holiday season. Understanding that the proposed plan is more than 12 years in the making, CCE believes the public deserves at least ***three opportunities*** to attend a public hearing to voice their opinion and hear other opinions on the clean-up plan options. Additional public hearings will allow more citizens the opportunity to reflect and provide meaningful and substantive comments about the public's preferred clean up alternative.

Thank you for your thoughtful consideration of our request. I look forward to your response.

Sincerely,

Dereth Glance
Program Coordinator

RECEIVED
DEC 10 2004
REMEDIAL BUREAU B

CC: Kenneth Lynch, NYSDEC Region 7 Director
Adrienne Esposito, CCE Executive Director

DEC - 8 2004
$ 7406

CITIZENS CAMPAIGN
FOR THE ENVIRONMENT

Protecting the environment and working for a healthy community.

☐ 225A Main Street • Farmingdale, New York 11735
Tel: 516-390-7150 • Fax: 516-390-7160
☐ 199 Main Street, Suite 319 • White Plains, New York 10601
Tel: 914-997-0946 • Fax: 914-997-0983
☐ 744 Broadway, Lower Level • Albany, New York 12207
Tel: 518-434-8171 • Fax: 518-434-8172
☐ 3144 Main Street • Buffalo, New York 14214
Tel: 716-831-3206 • Fax: 716-831-3207
☑ 466 Westcott Street, 2nd Floor • Syracuse, New York 13210
Tel: 315-472-1339 • Fax: 315-472-1179

RECEIVED
MAR - 3 2005
REMEDIAL BUREAU B

6-6

March 1, 2005

Donald Hesler/Timothy Larson
Onondaga Lake Superfund Site—Public Comment
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7016

RE: Comments on the Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site Proposed Plan

Comments by Citizens Campaign for the Environment

Citizens Campaign for the Environment (CCE) is an 80,000 member, not-for-profit, non-partisan advocacy organization working to protect public health and the natural environment throughout New York State and Connecticut. CCE operates from five regional offices across New York State and interacts with New York and Connecticut residents to advance sound environmental policies throughout the year.

CCE has participated in Superfund remediation efforts across the state including the Hudson River, Brookhaven National Laboratory, LiTungsten and others. CCE has been monitoring and participating in the Onondaga Lake remediation efforts since opening our Central New York/Finger Lakes Regional Office in 2002.

CCE supports remediation of the Onondaga Lake Bottom that is sufficiently protective of human health and the environment. CCE has been an active participant the comment period on the Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site Proposed Plan, herein referred to as the Proposed Plan. CCE has worked to gain a thorough understanding of the Proposed Plan to raise founded concerns, offer meaningful solutions, and to educate the public about the Proposed Plan. CCE staff met directly with New York State Department of Environmental Conservation (Department) Region 7 staff, Honeywell International representatives, and independent scientists. CCE has interacted with Department Proposed Plan experts at multiple public availability sessions, offered testimony and comments at both public hearings, and participated in forums held by community organizations.

Onondaga Lake Background and Brief Discussion of Extent of Lake Bottom Pollution

Considered one of the most polluted lakes in the world, Onondaga Lake, located on the northwest side of Syracuse, NY, was once a celebrated resort area and continues to be considered sacred waters by the Onondaga Nation. A symbol of peace and democracy, Onondaga Lake hosted the historic gathering of Native American nations to plant the tree of peace—to symbolize the end of war, killing and violence and form the Confederacy or Haudenosaunee.

However, a century of abuse left a legacy of industrial chemical and municipal sewage contamination in Onondaga Lake. Inadequate sewage treatment led to a ban on swimming in 1940. Fishing was banned in 1970 because of industrial mercury contamination. The fishing ban prompted the New York State Attorney General to sue Allied Chemical Corp. (later known as AlliedSignal, which is present-day Honeywell) to stop mercury dumping, which was calculated to be 22 pounds of mercury per day. A total of 82 tons of mercury and other chemicals have been discharged into the lake over the last century. In 1995, Onondaga Lake was added to the Federal Superfund National Priority List.

The Proposed Plan is a result of years of remedial investigations and feasibility studies to understand the extent of pollution and present pollution remediation strategies. Onondaga Lake bottom sediments are contaminated with persistent industrial toxic waste discharges of volatile organic compounds (VOCs), oils and petroleum derivatives, polychlorinated biphenyls (PCBs), dioxins and furans, and mercury. Initial sampling have detected these contaminants as deep as 27 feet below the lake bottom in the most contaminated area of the lake, commonly referred as the In Lake Waste Deposit (ILWD) or Sediment Management Unit (SMU)1, 2, and 7.

Discussion of Alternatives

In the Proposed Plan, the Department proposed seven alternatives for Onondaga Lake Bottom remediation. The required "No Action Alternative" and six additional alternatives that all propose a combination of dredging contaminated lake bottom sediments and capping. The alternatives most significantly differ on the quantity of sediment removal through dredging. The Department recognizes that alternatives six and seven "would provide greater long term effectiveness than Alternative Four (the preferred Department alternative), but that the quantity of dredged material would "likely exceed capacity of a single [Sediment Containment Area] SCA."

CCE recognizes the technical limits to removing 100% of the contamination and understands the real physical constraints of depositing quantities of contaminated dredged
1 material that would exceed more than one SCA. In general, CCE supports the dredging and isolation and thin layer capping approach to remediate the Onondaga Lake bottom.

Comments
After careful review of the proposed plan, in general CCE supports the Department preferred alternative four, contingent upon acceptance of our following comments: 2

1. **Ensure lake bottom remediation plan transparency and citizen participation.** The Department's preferred alternative, like all other alternatives presented, is conceptual. Many of the key decisions, including the appropriate depths to dredge, thickness of isolation caps, construction design of a proposed hydraulic control system necessary to maintain cap effectiveness, aeration pilot study, and non-hazardous dredged material landfill or Sediment Contaminant Area (SCA) design and specific location, and scope of monitoring requirements---will be made during the Remedial Design Phase. The Remedial Design Phase is the time between the issuing of the final Record of Decision (ROD) and construction. Our current understanding is that the Design Phase will not be a public-participatory process. **CCE strongly believes that transparency and citizen participation throughout the entire process is necessary to gain community support, confidence, and acceptance.** 3

   Recommendation #1 **CCE recommends that the Department establish a Citizens Advisory Committee (CAC).** CCE believes the CAC should advise, provide guidance, and support to Onondaga Lake remediation efforts. CAC members should meet on a regular, perhaps monthly basis, to review plan implementation, provide input on design phase decisions, and receive reports on Onondaga Lake remediation progress and challenges. **The CAC should consist of members representing the Onondaga Nation, scientists, environmentalists, local government officials, and concerned citizens.** Such CACs are well established throughout New York State and the nation and have been beneficial to government agencies, stakeholder organizations and the general public. A CAC would be an easily accessible stakeholder body to consult the public with any unforeseen scenarios, such as an ineffective ground water barrier. CAC members would gain a deeper technological understanding of the remediation effort and could assist in efforts to help inform the public. CCE respectfully requests consideration of membership on the CAC.

2. **Provide formal public participation opportunities on especially controversial components of the Remedial Design Phase.** The proposed plan calls for dredged contaminated sediments to be placed in the Sediment Containment Area (SCA) or if considered hazardous waste, the dredged material will be transported to an offsite permitted hazardous waste site. The SCA is proposed to be built upon one of the Solvey wastebeds, currently classified as category III hazardous waste site by New York State. The final SCA design will be determined by geotechnical testing and screening. Conceptually, the plan calls for the SCA to meet all federal and state requirements and will minimally have an impermeable liner installed, leachate collection and treatment, and an isolation cap. During our interaction with the community throughout the comment period, CCE heard, on a number of occasions, 4

significant community concerns about the SCA. **In general, CCE supports the conceptual design of the SCA, however CCE strongly believes direct public participation on this remediation component is appropriate, necessary, and imperative for community acceptance.** The public has a right to review the specifics of the actual SCA design, review alternative designs, and have the Department consider their comments.

Recommendation #2 CCE believes the Record of Decision should guarantee the public that the SCA will be subject to a full Environmental Impact Statement (EIS). Once the engineering and design are complete for the SCA, CCE believes an official public comment period of at least ninety days should be required to provide the public ample opportunity to participate.

5 3. **Actively integrate upland remediation and continued reduction of contaminant loads to support the Onondaga Lake Bottom remediation project.** CCE supports the Department's proactive approach to coordinating the multiple remediation efforts to reduce pollutant loading to Onondaga Lake through Interim Remedial Measures (IRM) like the Willis/Semet Barrier. ***CCE believes this same level of coordination with ongoing remediation efforts should include Department permitted loadings to Onondaga Lake from the Metropolitan Syracuse Wastewater Treatment Plant (Metro) discharge.*** CCE is highly concerned with the Draft State Pollutant Discharge and Elimination System (SPDES) permit number NY-002708, which is currently open for public comment until March 28, 2005. CCE plans on submitting formal comments on the SPDES permit, but believes the following points relate directly to the efforts to remediate the Onondaga Lake bottom. In the draft permit, the Department finds it "reasonable" to increase the permitted amount of mercury discharged from Metro outfall 001 to be 0.52 lbs/day. The three-year daily maximum of mercury from Metro has been 0.196 lbs/day for total recoverable mercury. Additionally, the Department is proposing to require Metro to monitor mercury for only one year.

CCE believes that permitting over 180 lbs of mercury per year into a portion of Onondaga Lake that will be dredged to remove mercury contaminated sediments and subject to an isolation cap to protect human health and the environment from mercury violates the spirit and intent of the Proposed Plan. Furthermore, CCE finds the limited monitoring requirement of Metro mercury discharges to be completely insufficient. CCE will reiterate these comments in our formal comments on draft SPDES number NY-002708. Understanding that Onondaga lake continues to experience mercury loading from atmospheric deposition, CCE urges the Department to scrutinize and reduce all point sources of mercury so that the remediation efforts required by Federal and State law achieve the stated goal of the Onondaga Lake bottom remediation effort.

6 Recommendation #3 CCE supports Atlantic States Legal Foundation's call for a "detailed matrix to be prepared that clearly defines all of the subsites for the Onondaga Lake Superfund Site with the schedules, remedies, technical contact

people, etc." which would also integrate all known or suspected sources of contaminants of concern or CPOI, including, but not limited to discharges from Metro, atmospheric deposition, non-point source pollution, and contaminated groundwater.

4. CCE specifically supports the adoption of the following in the Record of Decision.

   a. **Conservative assumption on the groundwater upwelling rate.** For use in developing the cap model, the Department has chosen a more conservative groundwater upwelling rate of 2.4 inches/year. This figure results in lowering hot spot concentrations that trigger additional contaminated sediment removal and is done so to help ensure isolation cap effectiveness. *CCE strongly supports the Departments erring on the side of caution when it comes to protecting human health and the environment.* 7

   b. **Additional sediment removal if the action levels for contaminants of concern are detected at greater depths.** CCE supports the Department requiring additional contaminated sediment to be removed if the contaminant concentrations exceed threshold values below 3.3 feet (1meter) dredge cut. 8

   c. **The goal of no loss of lake area or volume.** Onondaga Lake has a large watershed, provides an important role in the Lake Ontario basin, and to whatever extent possible, should not be filled in. 9

   d. **Hydraulic dredging technology.** CCE finds mechanical or clamshell dredging to be environmentally insensitive due to excessive sediment resuspension. CCE considers clamshell dredging be an antiquated and less effective toxic sediment remediation technology. 10

   e. **The remediation goals for sediment, biological tissue and surface water.** In particular, CCE understands that achieving pollutant fish tissue concentrations that are protective of humans and wildlife that consume fish is a long term goal and should be supplemented with public education and outreach efforts to protect human health in the near term. 11

   Recommendation #4 CCE strongly believes the Department should require public education and outreach efforts about the risk to human health from consuming Onondaga Lake fish as part of the remediation plan to protect human health.

Conclusion

Recognizing the court-defined time constraints surrounding the Proposed Plan, CCE
especially appreciates the Department's efforts to be available, flexible, and responsive to
citizen concerns, advice, and comments during this process. CCE supports the conceptual
12 Onondaga Lake Bottom remediation plan Alternative Four that addresses the above outlined
concerns and adopts the above recommendations. CCE looks forward to the Proposed Plan
moving forward and ending the legacy of toxic industrial contamination in Onondaga Lake.

We thank you in advance for careful consideration of our comments.

Sincerely,

Dereth Glance
Program Coordinator

cc: Ms. Adrienne Esposito, CCE Executive Director
Ms. Denise Sheehan, NYSDEC Acting Commissioner
Ms Kathleen C. Callahan, EPA Region 2, Acting Regional Administrator
Honorable George Pataki, New York State Governor
Honorable Elliot Spitzer, New York State Attorney General
Honorable John DeFrancisco, New York State Senate
Honorable David Valesky, New York State Senate
Honorable Joan Christiansen, New York State Assembly
Honorable William Magnarelli, New York State Assembly
Honorable Jeff Brown, New York State Assembly
Honorable Nicholas Pirro, Onondaga County Executive
Honorable Matthew Driscoll, Mayor, City of Syracuse
Honorable James Walsh, United States House of Representatives
Honorable Sherwood Boehert, United States House of Representatives
Honorable Charles Schumer, United States Senate
Honorable Hillary Rodham Clinton, United States Senate

Sierra Club/Iroquois Group
PO Box 182
Jamesville, N.Y. 13078

Donald Hesler/Timothy Larson, Onondaga Lake Superfund Site-Public Comment
NYSDEC
625 Broadway
Albany, N Y, 12233

Gentlemen,

The Sierra Club, Iroquois Group (Central New York), Executive Committee appreciates the opportunity to comment on the Proposed Plan for Onondaga Lake Superfund Site.

We congratulate both DEC and Honeywell for the outreach to the community in the many meetings held throughout the county. 1

The most impressive effect of this outreach is that there is finally a public awareness and hope for the future of the lake. A public that has seemed for years to give up on the possibility of a rehabilitated lake. A public that preferred to "Loop the Lake" than even mention remediation. A public that accepted a toxic lake as inevitable, like lake effect snow.

Now that hundreds are aware and concerned, we request that the DEC and Honeywell informational web sites and newsletters be augmented by a weekly "State of the Lake" in the local Sunday paper-like the one that has promoted Destiny for years. This would include questions and answers. 2

This action would assure that the public concerns could be constantly addressed and the public drive to see this action through would be kept alive.

This same venue (newspaper) should also be a procedure for establishing goals, or end-points, for the cleanup action. A vision for the lake would have check points at which the goals would be reevaluated. These goals should be established with public participation and include all other sites, metro, etc.

One of the remedial goals in the PP is edible fish tissue, by humans and wildlife. Another is to achieve surface water standards. These goals need to be put to the public for input and/or revision. Goals that also may be affected by scientific realities.

Dredging, storage, and transportation of contaminated sediments should include input from the State and County Health Departments and constant monitoring and communication with the people in close proximity to the chosen Solvay Waste Bed. 3

We support the start of actions to clean up the lake as soon as practical and the long term monitoring programs, especially inspection and repairs for cap effectiveness. 4

Thank you for the opportunity to comment on this most important action.

Martha Holly Loew, Chair
Sierra Club, Iroquois Group.

(comment received via e-mail from mloew@twcny.rr.com on 3/1/05)

ONONDAGA AUDUBON SOCIETY, INC.
Box 620 Syracuse NY 132010620
February 16, 2005

Re: Comments regarding the proposal to restore Onondaga Lake by the NYS DEC -

The Onondaga Audubon Society was formed in 1950 and, as the Society grew in membership, field trips increased and new birding areas were discovered. One of these sites was the southeast shore of Onondaga Lake. The area from the mouth of Nine Mile Creek to the south east corner had hundreds of shorebirds stopping there in the early summer. These birds had already bred in the far north up to the arctic circle, and were on their way to winter in South America. Probing their bills into the sandy shore, they found plenty of tiny insects and many other sources of food. As the summer passed, new species would arrive as others left, much to the pleasure of the birders. The Shorebird migration ended in mid September.

As more birders came, more species were found, including some very rare shorebirds from the British Isles. During the 1960's, Onondaga Lake was one of the best place to see shorebirds in Upstate New York. By 1972, there were 31 different species of shorebirds.

Unfortunately, a new, very aggressive weed from Europe, Phragmites, began to occupy the areas around the south shore and seemed to get worse once RT. 690 was finished. Phragmites are now all along the interstate highways. They grow to six feet and have a wavy gray top. Birds and mammals leave these areas. By 1975, the Phragmites was so dense that the shoreline disappeared. Shorebirds had no place to land and passed by. Now, you have to go to Montezuma NWR to see shorebirds. Unfortunately, one needs a powerful telescope to see them. Shorebirds continue to fly over the Onondaga Lake in summer but they have no place to land.

The OAS Proposal to restore the south east shoreline of the Lake:

1. **Remove the Phragmites**. It can be done with special mitigation procedures. People will be a great deal happier if they can see the Lake and, with a re-constructed beach, the shorebirds will come. 1

2. **Control Dogs on the loose**. Dogs will disrupt shorebirds and chase them away. If dogs are loose on the pathway, the most effective method is fencing certain places along the shore to keep dogs out.

3. **Build observation blinds** in two locations, one to view the outlet of Nine Mile Creek and another further to the east to view the southeast corner of the Lake. These blinds could be connected with the fencing in each specific area.

4. **Plant trees and shrubs** on the hill behind the pathway using species that will attract song birds.

Robert E. Long MD 989 James St. Apt 9H Syracuse, NY 13203 4750681

6 - 9

State University of New York
COLLEGE OF ENVIRONMENTAL SCIENCE AND FORESTRY

MAR - 1 2005

February 25, 2005

Kenneth P. Lynch,
Regional Director
NYS DEC Region 7
615 Erie Blvd. West
Syracuse, NY 13204-2400

Dear Ken:

Thank you for your presentation to our ESF group on February 21. Attached is the letter that Neil Ringler sent to Tim Larson for the March 1st deadline. We hope that you will take a look at it, as it details some of the reasons for our excitement about working together as the Plan moves forward.

We would like to propose a structure for SUNY ESF to contribute to the design and monitoring of the activities outlined in the Plan. Representatives of several of our Faculties are highly motivated and prepared to participate in the plan, both during the design phase and in the various monitoring aspects. These Faculties (Departments) include Environmental and Forest Biology, Environmental Resources & Forest Engineering, Chemistry, and Landscape Architecture. A partial list of faculty ready to participate is attached.

We propose three elements at this stage:

1) A guided set of meetings at approximately bi-monthly intervals to coordinate the many complementary elements of ESF's participation in the Plan. Neil Ringler would take responsibility to coordinate these on behalf of ESF. These meetings would also include close colleagues at Upstate Freshwater Institute and Syracuse University who have shown interest and productivity in contributing to the scientific solutions of the lake and its watershed. The meetings would be coordinated with those of the Partnership and other interested parties. We would propose a formal role with the Partnership team if possible. Products of the meetings would include recommendations and steps for implementation of the aspects of the Plan that are particularly well understood by the academic community. 1

2 2) A set of seminar/courses beginning Fall 2006 that deal with some of the major issues and opportunities in the lake. These courses, initially at the graduate level, would include as participants/instructors the people actually taking responsibility for the plan, including NYSDEC regional biologists and engineers, Honeywell scientists/engineers, and in some cases subcontractors and ESF/SU scientists and engineers.

3 3) 3) A comprehensive monitoring plan that develops a practical approach to blending the existing County plan with university scientific monitoring

We look forward to further discussing this proposal, and would be pleased to meet anytime to work out details and develop a time table.

Sincerely,

Cornelius B. Murphy Jr.
Cornelius Murphy, President

Neil H. Ringler
Neil H. Ringler, Chair
Faculty of Environmental & Forest Biology

Cc. Lynette Stark

6-10

State University of New York
COLLEGE OF ENVIRONMENTAL SCIENCE AND FORESTRY

February 25, 2005

"Onondaga Lake PP Comments"

Donald Hesler/Timothy Larson
Onondaga Lake Superfund Site- Public Comment
NYS Dept. Environmental Conservation
625 Broadway
Albany, NY 12233-7016

Dear Sirs:

My letter is written from the perspective of Chair of the Faculty of Environmental and Forest Biology at SUNY ESF, a broad and capable group with interest and expertise in the Onondaga Lake system (faculty in several other ESF departments bring additional expertise and experience). I also write as a scientist engaged directly in ecological studies of the lake: my graduate students and I have worked on the littoral habitats and fisheries since 1986. I have taught many undergraduate students on the shores of the Lake, and I have lived in nearby Baldwinsville since 1975.

I am generally pleased with the proposed plan. Technical pitfalls such as the 1
problems that would emerge if oxygenation cannot bring SMU 8 into compliance will doubtless be addressed by many others during this comment period, and thereafter. It was encouraging to see our 1990's work on littoral habitat cited and considered during the remedial investigation. It was refreshing to learn that habitat (not solely waste
removal and risk reduction) was a central feature of the plan. I believe that the apparent 2
positive responses of such a broad sector of the scientific and neighborhood community were tied to the flexibility provided during the design phase.

In addition to the work carried out with EPA support during the 1990's, the Onondaga Lake Cleanup Corporation/Habitat Team has made substantial headway in assessment of a Permanent Habitat Module on the northwestern shoreline, near a recently connected wetland. These data appear to represent the only recent, detailed data that might be of particular application during the next three years of design. This work and the more extensive experimental base that preceded it will need to be integrated into the overall assessment plan.

As indicated at recent meetings (Air and Waste Management Association in 3
Syracuse; Honeywell technical personnel and later with Mr. Ken Lynch at ESF), the new plan provides a great educational opportunity for students of all levels at SUNY ESF. The proximity of the teaching learning enterprise to the Onondaga Lake system provides an enormous opportunity to fashion unique and timely responses and solutions to the problems that lie ahead. The College is also in a strong position to help to fashion an appropriate and lasting Vision (2020 or beyond); many of us have worked energetically under the earlier and more restricted Salmon 2000, which was a significant impetus for

many projects. Dozens of interactions over many years have shown that local community people look to the College for its expertise and commitment to restoration of lake habitats.

In addition to contributions to the design phase, the resources and facilities at ESF would be highly valuable in monitoring many aspects of the plan. Current funding to university personnel is highly restricted, as most monitoring has been subsumed by county programs. Although these programs are themselves monitored and have been evaluated by NYSDEC, there are many reasons to encourage a broader base of monitoring and particularly of assessment and analysis.

I look forward to the opportunity to work energetically to coordinate and focus our teaching/learning opportunities in our Environmental & Forest Biology Faculty and at ESF as the design phase of the work moves forward. On behalf of my students and colleagues, I thank NYS DEC for the extensive opportunities to learn about the Plan and to provide constructive input.

Neil H. Ringler
Distinguished Teaching Professor and Chair
Faculty of Environmental and Forest Biology
SUNY College of Environmental Science and Forestry
Syracuse, NY 13210 (315) 470-6770

ATLANTIC STATES
LEGAL FOUNDATION, INC.

25 February 2005

Donald Hesler/Timothy Larson
Onondaga Lake Superfund Site – Pubic Comment
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7016

Re: Onondaga Lake PP Comments

Gentlemen:

The attached comments represent Atlantic States Legal Foundation's formal submittal to the hearing record for the PRAP for Onondaga Lake Bottom Subsite of the Onondaga Lake Suerfund Site (Lake Bottom). Our submittal consists of this letter followed by a copy of our submission of 27 January 2005 to the National Remedy Review Board of EPA and some additional materials submitted here for the first time. As you have previously received a copy of our previous submitted detailed report on the geo-spatial analysis of sediment contamination in Onondaga Lake, which was resubmitted to EPA as Appendix A of our comments, we are not attaching another copy with these comments. If you need another copy, we can submit one to you on CD.

The comments submitted have been prepared by Atlantic States Legal Foundation with the assistance of our technical consultants Hughes Consulting Services and Geographical Modeling Services. Financial support for employing these technical consultants is acknowledged from the EPA TAG program.

We appreciate the opportunity to discuss details of the PRAP with you and your consultants as well as with Honeywell and their consultants. These meetings greatly improved our understanding of the objectives and the substance of the complex PRAP document. We hope that our comments will be valuable to you as you prepare the final ROD for this subsite. Basically our comments analyze some of the scientific and technological basis for your proposal action alternative and encourage some alternative analysis and conclusions from your work. Further, we suggest other necessary work that must be done to maximize the public benefit from this large expenditure of funds and to further insure the integrity of the process. Some of this additional work needs to be incorporated as part of the ROD and other items are probably better handled as side agreements with Honeywell.

658 West Onondaga St. Syracuse, NY 13204-3711 (315) 475-1170 FAX (315) 475-6719 Atlantic.States@aslf.org

Our comments are meant to stand alone along side of the PRAP and the various technical submittals upon which it was based. Obviously, these are very lengthy and complex documents and our time and resources to analyze them was less than ideal amount. If our comments require further clarification or elaboration, we will be happy to provide supplemental materials to you.

Very truly yours,

Samuel H. Sage, President

Submission to New York State Dept. of Environmental Conservation
Comments on Onondaga Lake Bottom Superfund Sub-site
Atlantic States Legal Foundation, Inc.
28 February 2005

Upland Sites

Onondaga Lake is the receptacle and ultimate sink for all manner of contamination that originates anywhere within its basin. Clean up of the Lake Bottom can only logically take place after all other upland sites have been isolated so that no more contamination can enter the lake. The Onondaga Lake Superfund Site consists of many subsites. These subsites are all in various stages of remediation, but in only one case (Ley Creek Dredge Spoils) has remediation been completed. There have been completed RODs for several of them, IRMs are in process in various cases, but in other cases studies are in more initial stages. Subsites also continue to be added. 1

As part of the ROD for the Onondaga Lake Bottom, Atlantic States Legal Foundation requests that a detailed matrix be prepared that clearly defines all of the subsites for the Onondaga Lake Superfund Site along with the schedules, remedies, technical contact people, etc. This schedule should be incorporated by reference into the ROD for the Onondaga Lake Bottom Subsite. This analysis is necessary for both *technical* and *public policy* reasons. The technical reason is clear: to prevent any recontamination of the Onondaga Lake Bottom Subsite from any upland sites. The public policy issues relate to clarifying and protecting the public interest in the overall work of the Onondaga Lake Superfund Site. The overall clean-up effort is a mammoth and lengthy undertaking. Many different subsites are being studied and subsequently remediated, each at a pace of its own and under differing site managers. Contaminants and remedies are unique to each subsite. Keeping all of this clear is a hard task that would be made much easier with this matrix and related materials supplied by the department as part of the ROD.

Wetlands 2

We are concerned with two wetland areas that must be cleaned up as part of the overall remediation, but seem to be falling outside of the existing RI/FS process and so are not yet included in any proposed ROD. These two wetland areas are discussed briefly in terms of the Lake Bottom Subsite, but then moved off to another process. Note: we realize that there are additional wetlands that must be evaluated and investigated as part of the overall superfund site. Onondaga Lake has lost most of its important wetland areas and it is critical to the future of the lake ecosystem that what is remaining be restored as much as possible.

The sites that concern us here are Wetland SYW-12 at the mouth of Ley Creek and Wetland SYW-19 at the mouth of Harbor Brook. In the former case, this wetland was proposed as a wetland educational center and later determined to be too contaminated for any public access.

This area needs to be remediated and returned to use as important wetland habitat. The latter area is very critical habitat and needs to be restored. As recently as the 1970's, this area of the shoreline provided the most important Central New York resting area for migrating shorebirds on their way south from nesting areas in the Arctic. Although the mud flats have largely been overrun with invasive *Phragmites australis*, common reed, restoration of the area is feasible and desirable for the wildlife and as an asset to community residents who used to go and view the birds when they were visiting the area.

3 Contingencies

In a project of this size, it is almost a certainty that unforeseen circumstances will arise which will necessitate a change in plans. Bad weather, equipment breakdown, delays, etc. are all things that, for the most part, can be worked around. In contrast to these relatively minor difficulties, there are some aspects of the plan which play a pivotal role in the success of failure of the remedial design. Chief among these is the effectiveness of the groundwater barrier walls being constructed as part of separate IRMs. One of the main purposes of these walls is to reduce the rate of groundwater movement through the sediment from about 200 cm/year to less than 8 cm/year, a greater-than-25-fold reduction. The entire design of the dredging and capping scenario proposed by DEC is predicated on this reduction. If groundwater moves through the sediments at higher rates, then contaminants left behind after dredging will move up through the cap and re-contaminate the lake bottom.

At this time, we do not know whether the barrier walls, with associated groundwater pumping systems, will be able to accomplish this major reduction in groundwater flow. Success will depend, no doubt, on the ability of the engineers to establish a "tight fit" with the marl layer underlying Onondaga Lake. There may be significant construction issues as well, given the extremely soft nature of the waste material in Waste Bed B and Harbor Br. In any event, the ROD for the Lake Bottom must address the fact the barrier wall in still under design, and thus its effectiveness is as yet unknown. This would have major ramifications for the remediation of SMU-1 and SMU-7. We therefore request that the proposed plan include a scenario for which the barrier walls are found to be ineffective. In all likelihood, this would necessitate the removal
4 of significantly more waste and sediments from SMU-1 and SMU-7. The ROD should also make clear how the public will be informed of any changes in plans and how they can respond to any such changes.

5 Monitoring and modeling of organic pollutants

Organic pollutants are one of the key drivers for the remediation of sediments in Onondaga Lake. Much is known about the concentration of a wide range of contaminants in the sediments, including chlorinated benzenes, BTEX, light and heavy PAHs, and chlorinated dioxins/furans. However, almost nothing is known about the distribution of these compounds in the water column based on conventional sampling data collected during the remedial investigation. For the most part, analyses have yielded "non-detects." According to the FS (p. 1-30), di- and tri-chlorobenzenes were detected in only one of 98 lake water samples collected in 1992. Benzene and chlorobenzene were detected in two of 11 near shore samples collected and analyzed in

1999.

Alternative approaches to sampling and analysis are available which greatly improve upon detection limits. In particular, a sampling device developed by Dr. John Hassett at the College of Environmental Science and Forestry, called PISCES, is capable of detecting organic pollutants at low concentrations (< 1 µg/L) in water. PISCES was used by Hubbard (1996), working under the direction of Dr. Hassett, to monitor a wide variety of compounds in Onondaga Lake in 1993-94. Approximate concentrations[1] of *p*-dichlorobenzene are shown in Figure 1. As shown, there is a strong concentration gradient along the southwest shore of the lake, with the highest concentrations (~4.5 µg/L) along the "causeway" in SMU-2. Concentrations decrease to the east and north, which is expected given the prevailing counter-clockwise circulation pattern in the lake.

Additional monitoring of the lake was conducted in 2002? by Avallone, another of Dr. Hassett's students. While his research was focussed on gasoline contamination from motorboats, he found that dichlorobenzenes, xylenes, and naphthalenes were consistently present in the waters of the lake. His monitoring efforts were considerably more intensive than Hubbard's: 10-11 locations were sampled weekly over the period ___ to ____. Like Hubbard, he found that the highest concentrations of dichlorobenzenes were in the SMU-2 area.

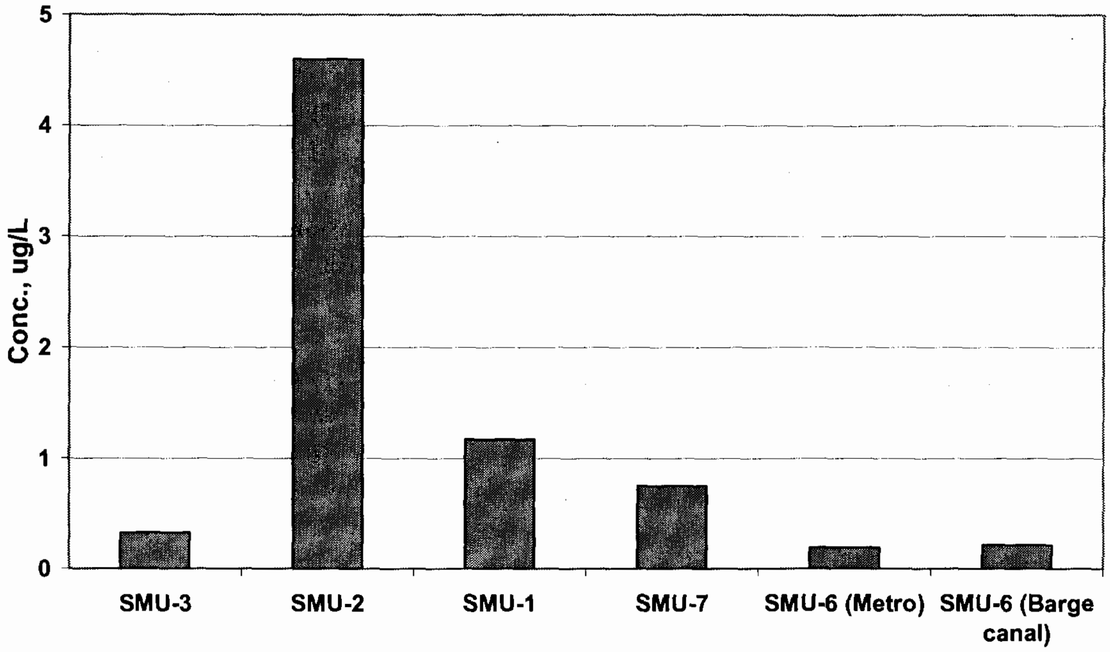
Another sampling methodology employing filtration, followed by XAD resin, has been used to achieve very low detection limits for hydrophobic contaminants such as PCBs, chlorinated dioxins/furans, PAHs, and pesticides. Researchers working in the Great Lakes, Chesapeake Bay, New York Harbor, and elsewhere have employed this technology. [For example, Simon *et al.* (2003) investigated contamination in the aftermath of the World Trade Center disaster on Sept. 11, 2001 using XAD.]

There are two important conclusions to be drawn from the foregoing. First, techniques exist which can be used to measure the concentrations of organic pollutants at much lower concentrations than obtained using conventional EPA methods. Secondly, these techniques can provide invaluable data relative to: pollutant sources, movement of pollutants in the lake environment, and, most importantly, the effectiveness of remediation.

---

[1] Concentrations from PISCES are considered approximate because sampling rates are somewhat variable, depending on water velocity. In a lake environment, this variability is likely to be small.

Fig.1 Concentration of 1,4-dichlorobenzene in Onondaga Lake, Oct. 1993 - Sept. 1994. Based on mean PISCES data. (Hubbard, 1996)



6 Sediment Toxicity Criteria

<u>(a) Calculation of PEC</u>

The Proposed Plan for the Onondaga Lake Bottom provides an extensive description of toxicity criteria used to determine remedial areas and volumes (pp. 38-43). In short, two types of acute toxicity tests, a 10-day survival test using *Chironmis tentans* or *Hyallella azteca*, were used to derive five site-specific sediment effect concentrations. The five concentrations represent a smorgasbord of sediment toxicity criteria, stemming from various proponents: the ER-L/ER-M method developed by Long and Morgan (1991), the TEL/PEL method developed by MacDonald *et al.* (1994, 1996), and the AET method developed by Barrick *et al.* (1988) and subsequently adopted by the state of Washington.

The results of the toxicity tests, evaluated at 79 stations in Onondaga Lake and 5 in Otisco Lake (control site), were then geometrically averaged to develop a "Probable Effects Concentration" (PEC). While this approach has been advocated as "consensus-based" value, we do not necessarily concur. A more defensible approach, we feel, is to select either the ER-M or PEL values as reasonable indicators of acute toxicity.

Although it is not explicitly stated, we assume that the concentrations of all organic compounds were normalized to organic carbon content. This forms the basis for ER-L, ER-M, SEL and PEL for nearly every organic compound. Please verify that this was properly done.

A more fundamental problem with the PEC is that it **does not include any margin of safety for chronic toxicity.** The PECs are derived from mortality over a period of ten days. As noted in the FS (Appendix J, p. J.2-3), "the degree of response has also been shown to be greater in longer term, chronic, and/or sublethal tests." Unfortunately, chronic toxicity data are lacking for Onondaga Lake. It is our contention that the endpoint for sediment contamination should be below a level which causes significant acute or chronic toxicity to organisms which may inhabit the lake. The goal should be for a healthy ecosystem, not just a less-severely impacted one. Toward that end, we would recommend that a safety factor of 10 be applied to each site-specific PEC, or that the chronic toxicity screening level established by NYSDEC (1999) be applied, whichever is higher.

An alternative approach would be to recalculate the PECs *without the use of the Apparent Effects Threshold values*. Each AET identifies an endpoint where acute toxicity is always expected to occur. It therefore does not provide any margin of safety even from the point of view of acute toxicity, let alone chronic toxicity. It is worth noting that, in the discussion of site-specific sediment quality guidelines (Appendix J of Nov. 30, 2004 Feasibility Study), there are no references to the use of AET. All examples cited on pp. J.3-3 toJ.3-4 refer to ER-M and PEL values.

(B) Calculation of PEC Quotients 7

There are 43 contaminants of concerns, or CPOIs, considered in the RI/FS. Only 23 of these were used to calculate overall sediment toxicity as these "appeared to exhibit the strongest influence on observed acute toxicity on a lake wide basis." (Proposed Plan, p.41). We would support a more conservative approach, i.e. keep all CPOIs which may contribute toxicity. In examining the acute toxicity graphs in Appendix J, it is unclear why some contaminants were retained while others were rejected. For example, the correlation coefficient (r^2) for chironamid mortality and PECQ for toluene was 0.25, while the r^2 for monochlorobenzene was 0.22, essentially the same. But toluene was dropped from the list of CPOIs, while monochlorobenzene was retained. Why?

There is nothing gained by eliminating CPOIs from further consideration other than having to do fewer calculations. Since we live in age of computers and spreadsheet programs, this should not be a factor.

All of the remaining PECs were then amalgamated into a single factor: the PEC quotient (PECQ). The process for doing this seems to be extraordinarily convoluted. CPOIs were grouped into five categories:

- metals (mercury)
- aromatics (ethylbenzene and xylenes)
- chlorinated benzenes (mono-, di-, and tri-subsituted)
- PAHs (16 compounds)
- PCBs (total)

A mean PECQ was calculated for each chemical class, and then the five chemical classes were averaged. This approach inherently gives unequal weight to different compounds. Each PAH represents one of 16 compounds, so each PAH contributes 1/80 (1.25%) to the overall PECQ. Xylenes, assuming they are treated as a collective group, contribute 1/10 (10%) to the overall PECQ. Mercury individually contributes 20%. What justification can there be for this disparity?

We note that naphthalene, in particular, is a major contaminant in Onondaga Lake, and further that it does not necessarily correlate with other PAHs. The Wastebed B/ Harbor Brook sub-site is known to be heavily contaminated with naphthalene, for example. The distribution of light PAHs is markedly different from heavy PAHs, as illustrated in Figs. 1.21 and 1.22 of the FS.

There is no scientific justification for weighting the PECs unequally. Each contaminant should contribute to the total PECQ with equal weight. Admittedly, there are practical limitations to this due to the vagaries of analytical chemistry. PCBs are reported as "totals" or "Aroclors" and thus must be considered collectively. Similarly, it makes intuitive sense to group isomers such as the xylenes together. But, to the greatest extent possible, each contaminant should be added individually. This is consistent with "an implicit assumption that the contributions of each chemical to toxicity are additive." (FS, Appendix J, p. 3-6) This is unbiased and consistent with most toxicological observations.

In conclusion, we recommend that the framework for calculating the PECQs be revised as follows:

1. Include all 46 CPOIs.
2. Calculate a PECQ for each
3. Develop an overall mean PECQ

8 <u>(C) Determination of an acceptable PECQ</u>

Once an overall PECQ has been calculated, a threshold value must be established for specifying which sediments require remediation. The DEC has chosen an overall PECQ of 1.0, along with the separate PEC of 2.2 ppm for mercury. As noted in the Plan. "The mean PECQ of 1 was determined to be protective and selected as a remediation goal to address direct acute toxicity to benthic invertebrates." (p. 42) But, as further noted on p.42, "The mean PECQ methodology itself *does not* explicitly address chronic toxicity." (emphasis added)

The lack of protectiveness that setting the PECQ = 1 provides is illustrated graphically in Figures J.14 through J.18. Each of these graphs shows the relationship between chironomid or amphipod mortality and mean PEC quotient for varying exposure periods. We have selected PECQ = 1 as a point of comparing all four graphs. This is summarized below:

	Mortality		
Species	10-day	20-28 day	42-day
chironomid	13%	42%	No data shown
amphipod	7%	20%	24%

It is clear from the above that **a PECQ = 1 is not adequate to protect benthic organisms**: two out of every five chironomids is expected to die over a three-week period, and one out of every four amphipods is expected to die over a six-week period. Bear in mind that the background mortality rate at Otisco Lake was about 2 percent.

Once again, this points to the need for a much more conservative approach to setting an acceptable PECQ. Based on the limited data in Fig. J.17 (42-day amphipod mortality), we suggest that a PECQ of 0.3 might be adequate. While this may have little impact on remediation of those areas already selected for capping with clean sand, it can have a substantial impact on determining what additional areas might require dredging and/or capping.

Emissions of Hazardous Volatile Substances 9

There are numerous CPOIs which are highly volatile, and which are hazardous to human health. The sediments to be dredged from SMU-1 and SMU-2 contain substantial quantities of volatile organics. A list of the most important of these is given in Table 1 below. Average concentrations and quantities expected in the first pass of dredging at SMU-1 are listed as well.

Table 1. Average VOC concentrations and masses in SMU-1, first dredging pass (1.2 m). Total dredged volume = 318,000 cy. Potential emissions based on 100% volatile loss.

Compound	Avg. Conc., mg/kg	Mass, kg	Potential Emission rate, g/hr
Benzene	2.24	292	336
Xylene isomers	29	3,785	4,355
Toluene	4.2	548	631
Ethylbenzene	2.05	268	308
BTEX (total)		4,893	5,630
mono-CB	41.3	5,391	6,202
di-CB	49.4	6,448	7,418
tri-CB	5.9	770	886
total CBs		12,608	14,506
Naphthalene	42.2	5,508	6,337
TOTAL VOCs		23,010	26,473

We recognize that an analysis of potential emissions has been undertaken in Appendix L of the FS. We remain concerned about two issues:

a) Exposure of workers to NAPL at the dredging site.

We agree with the assessment that hydraulilc dredging is preferable to mechanical dredging since the potential for exposure to both workers and residents is much reduced. Nonetheless, as noted in Appendix L: "There is at least one area near the causeway in SMU-2 where pure-phase chlorobenzene liquids may exist." (p. L.4-5). It is later noted that "the only air quality issue associated with the point of dredge is the potential for the occurrence of NAPL containing VOCs in the dredge materials." (p.L.5-5) Modeling of air quality near the dredge operating in SMU-1 resulted in the following: "The maximum predicted air concentration of benzene at the point of dredging has the potential to exceed the OSHA PEL values…by a factor of 9." The text suggests the use of silt curtains baffles and booms to minimize exposure. This is a good start, but serious consideration must be given to foams and protective gear for workers as well.

10 b) Emission of contaminants from the Sediment Consolidation Area (SCA)

If the release of volatile organics is potentially an issue at the point of dredging, then surely it must be an even greater issue as the other end of the pipe. As noted above, NAPL which is currently bound in the pores of the sediments will be released when the material is disturbed by the dredgehead. Hopefully most NAPL will be sucked into the pipeline. This therefore will be an emission source at the SCA. Residences are located within one-half mile of Wastebed 13, the expected SCA site.

As shown in Table 1, there is thousands of kg of VOCs in these sediments. Concentrations vary greatly over space. Chorobenzene, for example occurs at a maximum concentration of 580 mg/kg in SMU-1 in the top 30 cm; dichlorobenzenes reach 393 mg/kg. When these pockets of highly contaminated sediments are encountered during dredging, there will be a large spike in emission rates at the SCA. It does not appear that this has been taken into account in the analysis presented in Appendix L.

We reiterate, then, that the SCA be preceded by a soil-washing/emission control system which would:

1) Capture emissions of volatile organics and NAPL. Floating NAPL can be intercepted using oil/water separator technology. Emissions could be destroyed through catalytic oxidation on-site, or condensed and sent off-site for disposal at a hazardous waste incinerator.
2) Greatly reduce organic contamination in the remaining sediments, thereby achieving a more permanent remedy under Superfund law.
3) Potentially recover substantial quantities of clean sand which could be utilized as cap material.

11 "Non-Honeywell" Pollutants

There are a number of contaminants in Onondaga Lake which are not unique to the Allied/Solvay Process operations on the western shore of the lake. These include:

PCBs
Heavy metals: arsenic, cadmium, chromium, copper, lead, nickel, and zinc
Other inorganics: aluminum, barium, cyanide, and selenium
Heavy PAHs and petroleum

With the exception of PCBs, which have been identified as bioaccumulative toxins, these substances have played a minor, if any, role in the remedial design.

There exists considerable evidence that these substances are having a detrimental impact on the lake environment. As noted in the FS, surface water criteria were exceeded for barium, copper, cyanide, lead, manganese, and zinc based on screening conducted for the BERA. In addition, heavy metal concentrations in deep-water sediments have been found to be well above the state-published "severe-effects" levels for metals in sediments, as shown in Table 2.

Table 2. Maximum concentrations in Sediment core S51, compared to New York State Severe Effects Levels (NYSDEC, 1999)

Element	Max. concentration (mg/kg)	SEL (mg/kg)	Exceedance Factor
cadmium	42	9	4.7
chromium	760	110	6.9
copper	375	110	3.4
lead	310	110	2.8
mercury	67	1.3	51.5
nickel	220	50	4.4
zinc	600	270	2.2

We submit that many of these substances should be given greater scrutiny. This is particularly true in assessing the success or failure of "monitored natural recovery" in SMU-8. This is not intended to detract from the importance of monitoring the 'Honeywell" contaminants—mercury, chlorobenzenes, and the like—but rather to emphasize the need to monitor these other contaminants as well. A successful remedial strategy must address all contaminants to the ecosystem.

To date, the entire investigation (RI), human and ecological risk assessments (HHRA, BERA) 12
and Feasibility Study have been borne by Honeywell. We wonder about the involvement of other companies or institutions which have contributed contamination to the lake. At what point will GE and or Martin-Marietta Corp., a known contributor of cadmium to the lake, be brought into the process? Ley Creek has been a known source of PCBs and other compounds. Three Onondaga Lake sub-sites, General Motors Fisher Guide Plant; the creek dredgings, and the Town of Salina landfill, have all been sources to Ley Creek. How will these be addressed?

REFERENCES

Avallone, Armando. ____ Master's Thesis, State University of New York College of Environmental Science and Forestry, Syracuse, NY (1996)

Hubbard, M.S. *Sources of Organic Contamination to Onondaga Lake*, Master's Thesis, State University of New York College of Environmental Science and Forestry, Syracuse, NY (1996)

Hughes, D.J., M.H. Hall, J.V. Mead, and P. Thompson. "A Geostatistical Analysis of Sediment Contamination in Onondaga Lake, N.Y.," prepared for Atlantic States Legal Foundation, Syracuse, N.Y. (2002)

Litten, S., D.J. McChesney, M.C. Hamilton, and B. Fowler. "Destruction of the World Trade Center and PCBs, PBDEs, PCDD/Fs, PBDD/Fs, and Chlorinated Biphenylenes in Water, Sediment, and Sewage Sludge," *Environ. Sci. Technol.* **37**: 5502-10 (2003)

NYS DEC. *Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site, Syracuse, New York.* Proposed Plan Nov. 30, 2004

Parsons (Consulting), Anchor Environmental, and Exponent. Onondaga Lake Feasibility Study Report, prepared for Honeywell, Inc. November 2004

Submission to EPA
National Remedy Review Board
Onondaga Lake Bottom Superfund Sub-site
27 January 2005
Atlantic States Legal Foundation, Inc.

We acknowledge and appreciate efforts by Honeywell and DEC to find a remedy for the contamination in Onondaga Lake and to include wide public involvement in these discussions. ASLF has benefited from extensive conversation with both Honeywell and DEC. At this point, ASLF is not prepared to take a position in favor of either the DEC or the Honeywell preferred alternatives. **We support getting started on actions to clean up and rehabilitate the Onondaga Lake Bottom. We agree that dredging and capping are necessary and design work leading to this work should commence as soon as practical.** At this point ASLF cannot comment on the extent of dredging and capping we feel is necessary. However, we do feel that organic contaminants, especially those that are liquid and volatile should be removed from under and within sediments in their entirety. Furthermore, we would insist that no loss of volume or surface area of the lake be allowed. 13

There is no sense in starting to remediate the Lake bottom if there are still pollutants entering the lake from upland sites. DEC should develop a matrix of all actions required from the Onondaga Lake Superfund Site, from closure plans with Allied (Honeywell), from state hazardous waste site remediation, from voluntary clean-ups, and any other regulatory measures that influence contamination of Onondaga Lake. This should be made available to the public and must form the basis for remediation schedules. 14

Vision: The entire community should be involved in a debate leading towards a vision for Onondaga Lake and its basin. This vision must take into account scientific realities, for example, the famous Onondaga Lake Whitefish was likely an endemic species which is now extinct. However, a vision is needed to develop end points in the clean up – not just the clean up of the Lake Bottom, but of all the sub-sites, Metro, habitat restoration, etc. The detailed remedial design must contain a habitat restoration plan. Developing the objectives of this plan involves public policy that can only profitably and democratically come from a thorough visioning exercise. Honeywell admitted to ASLF that they were uncomfortable having to make certain assumptions about habitat objectives absent any clear public policy determinations. This void in the entire lake clean up program should be filled as soon as possible. ASLF realizes that this might be beyond the purview of the Superfund program. However that doesn't mean it isn't necessary for a successful outcome of the Superfund clean-up program for the lake. 15

Monitoring: An extensive, long-term (at least 30 years, but really, indefinite) monitoring plan must be developed. This normally would be developed by Honeywell and the work would be largely done by them. DEC would have to approve the plan and would oversee its implementation. ASLF feels strongly that an independent scientific team must be assembled to develop this plan. The monitoring work would need to be 16 done very carefully with full involvement of biostatisticians, chemists, environmental modelers, and others. Monitoring must be coordinated with the extensive County monitoring plan. An end point needs to be established that would provide a means of determining success of the remediation. An end point is needed regardless of using a "build and measure" approach or using mathematical models for significant parameters. An outside peer review team should critique the plan before it is implemented. Ideally an outside, neutral group should be assembled to implement the plan as well.

17 The plan will be costly to implement. The estimate is $3,000,000 per year in today's dollars. ASLF believes that Honeywell should pay up front for this work by creating a fund just to be used for this purpose. There are too many cases of companies disappearing over a long period of time and thereby leaving the community in the lurch for this necessary work. Although it might be beyond the legal scope of Superfund to require this, Honeywell has indicated to ASLF that they might be willing to establish such a fund and so it must be seriously considered.

18 Finally and most critically, the monitoring must begin immediately. Baseline data is needed to validate model predictions (see below) and to make sure there is a statistically significant data base if a "build and measure" approach is used exclusively. How can we tell if the plan is working, if there isn't any baseline monitoring?

19 **Modeling:** In preparation of the FS and then in the PRAP, no predictive models for long-term trends in the major pollutants in the environment were employed. There was a nine-month effort to develop a mercury model, but that effort, deemed useless, was cancelled. Predictive, mathematical modeling should be done for the most important pollutant parameters. These include mercury, chlorinated benzenes, PCBs, and PAHs. A sampling protocol should be developed immediately and sampling for the models begun as soon as possible so that three years of baseline data can be collected before the actual dredging and capping begins. Ideally the work should be done by an outside consortium of scientists coming together for this purpose. Honeywell should create a fund to pay for this work. An outside peer review group should be convened at key stages of the work. Only with such a model will we be able to predict how much clean up is necessary to assure edible fish flesh for human and animal consumption. If this isn't considered a Superfund requirement, then negotiations outside of the Superfund program should take place leading towards an acceptable protocol for developing, testing, and using these models.

20 **Public Participation**: Dealing with the clean up and rehabilitation of Onondaga Lake is very complex presenting many scientific, engineering, economic, and public policy challenges. Help for the public in understanding all of this is minimal. ASLF is the TAG agency designated as such by EPA. However, our resources under this program are minimal. Otherwise our public agencies have provided little assistance other than the availability of documents either electronically or in depositories. The one public meeting on the PRAP represents the only formal public input to DEC. The process from now until final construction is completed —currently estimated as seven years—is a long and uncertain one. The public needs to be informed as to what is happened, to be solicited for

their input on various engineering alternatives, and to be kept part of the process. Unfortunately, with the other sites, proposed remedies and RODs were finalized and approved with little or no public discussion. Further work on these sites is generally being done without any further input from the public even if there are extensive changes in the ROD. In the case of the Lake Bottom Sub-site, the January meeting on the PRAP should be just the first in regular attempts to inform the public and to solicit their input on a complex program to alleviate a difficult problem. ASLF is ready and willing to continue to be the lead outside agency in making sure the public understands what is happening and is kept informed and is seeking additional resources to be able to carry out this important task.

Technical considerations:

1. **Baseline risk assessment** 21

ASLF is concerned that the human health risk assessment that forms the basis for much of the subsequent work on the RI/.FS and PRAP did not use the populations most at risk. In our view, people who disregard fish advisories and subsist on fish caught in the lake should have been the basis for the analysis. Syracuse has a large population of immigrants and economically disadvantaged who routinely consume fish from Onondaga Lake. The other at-risk population is the Onondaga Nation, for whom the spiritual values of this water body and subsequent loss to their culture and changes in diet must be factored into the risk analysis.

2. **Profundal zone (SMU-8)** 22

The profundal zone contains the vast majority of the 70+ tons of mercury which were discharged into Onondaga Lake. The mercury is spread throughout the lake, reaching maximum concentrations of 70 mg/kg in the top 50 cm. It is this mercury that is the main source of methylmercury which contaminates fish and poses a threat to fish-eating humans and to wildlife. Reducing this threat is a fundamental aim of the PRAP, as expressed in the following Remedial Action Objectives:

(1) Eliminate or reduce,...methylation of mercury in the hypolimnion
(3) Eliminate or reduce,...releases of mercury from the profundal sediments, and
(4) Eliminate or reduce,...existing and potential future ecological risks on fish and wildlife resources, and potential risks to humans.

Despite the great importance of SMU-8, there is almost no remedial action currently planned for the sediments in the profundal zone.. Thin-layer capping would be applied over four small, disparate zones—one at "North Deep," two along the western shore, and one directly north of the In-lake Waste Deposit. These locations appear to be driven mainly by exceedance of the PECQ = 1 criterion. However, mercury occurs at concentrations above the PEL of 2.2 mg/kg throughout the profundal zone. According to our estimates, between 25 and 50% of the lake bottom (0-30 cm) is contaminated at levels above the PEL. Examination of Figure 1.10 in the FS shows an even higher fraction of the lake bottom (0-30 cm) having mercury concentrations in excess of 3.16 mg/kg. This corresponds to an area of about 600 hectares, or 1500 acres. This vast area of the lake will continue to be toxic to benthic organisms for a long time into the future.

23 A. Mercury reduction in the upper-most sediments

On p. 54 of the PRAP, it is stated that the STELLA model predicts that concentration of mercury in the surface sediments will decrease from 6.7 to 2.2 mg/kg over the period 1992- 2014 (22 years). Examination of the modeling of "monitored natural recovery" in Appendix N of the FS shows that there is considerable uncertainty in this estimate. This is largely because the basic data to support the model are lacking. Only five sediment cores with fine resolution (2-cm sections) have been collected, the most recent of these in 1997. In fact , the validity of the model was tested based on a *single* core collected in 1997. Parameters had to be manipulated to make the model fit even this single core.

24 While there is no disputing that Hg concentrations have decreased since 1970, the authors (Anchor Environmental, Inc. *et al.*) admit that "there appears to be insufficient surface sediment data to make any conclusions regarding trends in surface sediment concentrations since 1987." We agree with that statement, and further assert that the model, such as it is, provides almost no technically sound basis for predicting a time frame for "natural recovery." The variables are simply too great, and the basic data set is far too limited. Any claims made in the PRAP that MNR is expected to achieve target mercury concentrations within 10 years are without merit and should be eliminated. Instead, MNR should be considered only as a potential remedial measure. Selection of MNR at this point is entirely premature.

25 B. Methylation of mercury

One of the most important objectives for Onondaga Lake is to eliminate or at least greatly reduce the mercury contamination in fish flesh. RAOs 1, 3, and 4 are all needed components to achieve this goal. Conversion of mercury to methylmercury, or methylation, is mediated by sulfate-reducing bacteria in anoxic environments. Thus the profundal zone of Onondaga Lake is a perfect environment for these bacteria to produce methylmercury. However, there is considerable uncertainty as to where and how much methylmercury is produced. Both the profundal sediments and the deep waters of the lake appear to contribute substantial amounts (Sharpe, 2003; TAMS, 2002). Previous attempts to quantify the movement of both total mercury and methylmercury have not been successful.

Despite these difficulties, the authors of Appendix N in the FS go ahead with attempts to model the methylation of mercury and the effect of oxygenation thereon. The model predicts the release of 800-2000 grams methylmercury per year from the profundal sediments. This is much larger than TAMS's estimate of 67g, but comparable to Sharpe's estimate of 1900g. Next, these numbers are compared to downward fluxes as particles settle to the lake bottom. These are estimated to range from 1600 g/yr (TAMS, 2002) to 2600 g/yr (Anchor *et al.*). Thus, the conclusion to be drawn is that there is considerable internal cycling of methylmercury, with 1-2 kg moving upwards our of the profundal sediments, and about 2 kg being deposited back from the water column.

Further, the model is used to estimate the effects of aerating the hypolimnion. The authors state: "it is assumed that aeration (oxygenation) causes a 50 percent decrease in the methylmercury concentrations present in settling sediments." Why? Based on TAMS estimates of methylmercury production in the lake (230 g) and rates of methylmercury inputs via settling (557 g), there is a leap of faith that oxygenation can greatly reduce the downward flux of methylmercury to the sediments. (Note that the TAMS estimates differ greatly from the model results.) The authors conclude that "although there is great uncertainty with this assumption, [modeling results] show that reductions in methylmercury production in the hypolimnion could cause substantial decreases in the upward flux of methylmercury from the profundal sediments over time. Thus, under this scenario, MNR combined with aeration could substantially and positively alter the equilibrium of methylmercury fluxes that appear to currently exist..."

These words are hardly reassuring, and are a poor basis for selection, even if tentative, of a preferred remedy. Clearly there needs to be a much better understanding of mercury cycling within the lake before moving ahead with a remedial plan including oxygenation.

As the above analysis shows, there is no solid scientific basis for remediation of SMU-8. There is no predictive model for what effect any remedial action will have on methymercury levels in fish flesh (RAO-4). Therefore, the Administrative Record, and ultimately the Record of Decision should reflect that further analysis is needed to achieve specific goals for mercury in fish, i,e, so that fish is safe to consume by humans and wildlife. As a result, additional remedial technologies, such as lake-wide thin-layer capping, should not be excluded from consideration.

3. <u>Expand boundaries of SMU-1 and adjacent SMUs</u> 26

ASLF has previously undertaken a detailed geo-spatial analysis of sediment contamination in Onondaga Lake (see Appendix A). This is generally accepted among spatial analysts as the optimal spatial predictor. As explained in the attached Technical Memorandum prepared by Geographic Modeling Services, the methodology employed by TAMS has, in all likelihood, led to distortions in the predicted distribution of contaminants shown in the FS. This has resulted in **under-estimates of mercury, chlorinated benzenes, BTEX, and possibly other contaminants in the profundal zone.** Our sediment maps (see Figures 1-5 in Appendix B) show that these chemicals permeate sediments located beyond the rather artificial 9-meter boundary used to separate the profundal and littoral zones. In fact, many maps in the FS support this same conclusion:

mercury 0-30cm and deeper (Figs. 1.10).
BTEX , 30cm-1m (Figs. 1.14-1.16)
chlorobenzene, 30cm – 2m (Fig. 1.17)
dihlorobenzenes, 30cm – 2m (Fig. 1.18)
LPAH, 0-2m (Fig. 1.21)
HPAH, 0-2m (Fig. 1.22)
PCBs, 30cm – 2m (Fig. 1.23)

In our opinion, SMU-1 should be expanded into the deeper waters of the lake so as to include this contamination. These highly contaminated sediments should be subject to the same dredging and capping remedial approach as the other sediments in the ILWD. SMU-7 and SMU-2 should be reexamined in this light.

4. Removal and treatment of organic contaminants

One of the primary goals of the Proposed Remedy is to "eliminate or reduce,...releases of contaminants from ILWD and littoral areas around the lake." In addition to mercury, these contaminants include a long list of organic chemicals:

BTEX (benzene, toluene, ethylbenzene, xylenes)
PAHs
PCBs
chlorinated benzenes
polychlorinated dioxins and furans
pesticides

Many of these contaminants are concentrated in distinct organic phases. We understand that there are three distinct types of organic phases in Onondaga Lake. These are:

27 a) **DNAPL**. This is denser-than-water free-product consisting mainly of chlorinated benzenes. This has been identified as a Principal Threat Waste by NYSDEC,since it poses a significant risk to humans and the environment. We agree that a high priority should be placed on capturing and destroying these wastes. Construction of the slurry wall along the south-west shore of the lake should be effective in this regard. Also, the removal of DNAPLs via dredging in SMU-1 and SMU-2, and possibly SMU-7 is necessary. This material must be handled with the greatest of care to minimize exposure to both workers and residents.

28 b) **NAPL.** Visible oil and oil sheens have been observed in sediment cores collected in SMU-1, SMU-2, SMU-6, SMU-7, and SMU-8 (see attached Figure 1.26 from the FS). This NAPL is an oil phase less dense than water, and includes light petroleum hydrocarbons (e.g. benzene), dissolved PAHs, and a class of compounds known as diphenylethanes. This latter group includes substances unique to the production of organic hydrocarbon fractions by Allied Chemical (Hubbard, 1996).

The PRAP identifies NAPL found within the ILWD (SMU-1) as Principal Threat Waste (p.28). Disturbance of the sediments results in sheens on the lake surface, and therefore removal of this material from SMU-1 is a high priority. However, we must point out that these wastes are visibly present in the other locations noted above and shown on the map. Under the selected Alternative (4), NAPL in SMU-1 AND SMU-2 will be positively addressed. However, it is unclear whether NAPL in SMU-6 and SMU-7 will be removed. It is clear that the NAPL found in SMU-8 by Hubbard (1996) will not be addressed at all. The plan should treat all NAPL as a high priority.

c) **Organic deposits.** In addition, there are reports of a tarry waste in or near SMU-2 which have a different nature. These are more solid than liquid, and are likely to have originated from the Semet-Solvay process. In addition, what appears to be emulsified organic deposits have been documented along the Waste Beds in SMU-3. This material is likely to sequester organic contaminants such as BTEX, PAHs, chlorinated benzenes, and dioxins. 29

ASLF endorses all efforts to remove, to the greatest extent possible, all of these organic materials from Onondaga Lake. They are highly toxic, mobile, and unsuitable for capping. Further, we believe that this material should be separated from the less-toxic, silts, sands, and Solvay Waste material which will make up the bulk of the dredged sediments. This is discussed further below. 30

5. **Disposal/treatment of dredged sediments**

Sediments are to be hydraulically dredged and pumped to Wastebed 13. Why was this site, the most distant Wastebed from the lake, selected? There are residential neighborhoods nearby. What about release of volatile contaminants—how is this to be controlled? The majority of the sediments to be dredged are from SMU-1, which contains high concentrations of volatile organics, such as benzene, toluene, chlorobenzene and the dichlorobenzenes. Residents and workers should not be exposed (via air emissions) to these hazardous substances. 31 32

We strongly urge that the ROD be written such that treatment of the sediments is required to separate out this material. Soil washing technologies, which have been demonstrated on sediments in Saginaw Bay, among other places, could be a very effective way to separate the calcareous Solvay Waste from the NAPL which occurs in and near the In-lake Waste Deposit. Separated NAPL would then be sent to an off-site incinerator for final destruction. This would achieve permanent reduction of toxicity, which is, again, a basic requirement of CERCLA. 33

It should be noted that, by using a treatment technology such as soil washing, the amount of sediment requiring off-site disposal is kept to a minimum, or perhaps even reduced to zero. Only the concentrated organics need be sent off-site for ultimate disposal. This reduces costs, and reduces the chances of road accidents. It may be that, depending on the remedy chosen for the Semet Waste Beds, the separated tarry wastes could be co-disposed with the Semet wastes.

Another potential benefit of soil washing lies in its ability to separate sand from fine-grained silts and clays. This technique was used at Saginaw Bay to produce a relatively clean sand fraction that was suitable for capping or unconfined disposal. In the case of Onondaga Lake, this technology could potentially be used to generate clean capping material, while reducing the amount of sediments being disposed of in the SCA. In our examination of boring logs from the lake, we have noted that considerable sand deposits exist within the lake. (see Appendix C, boring logs for Stations S329-334)

These comments were prepared by Samuel H. Sage of Atlantic States Legal Foundation, with the assistance and input of our TAG consultants, Hughes Consulting Services and Geographic Modeling Services.

REFERENCES

Effler, S.W. *A Limnological and Engineering Analysis of a Polluted Urban Lake,* Springer-Verlag, Inc. New York (1996)

Hubbard, M.S. *Sources of Organic Contamination to Onondaga Lake*, Master's Thesis, State University of New York College of Environmental Science and Forestry, Syracuse, NY (1996)

Hughes, D.J., M.H. Hall, J.V. Mead, and P. Thompson. "A Geostatistical Analysis of Sediment Contamination in Onondaga Lake, N.Y.," prepared for Atlantic States Legal Foundation, Syracuse, N.Y. (2002)

APPENDIX A

APPENDIX B

TECHNICAL MEMORANDUM

To: Atlantic States Legal Foundation
Fr: Myrna H. Hall, Geographic Modeling Services
Re: Mapping of Contaminated Sediments in Onondaga Lake
Da: 26 January 2005

Prediction of contaminant concentrations

In the FS, the lake has been divided into two zones: the profundal zone (>9m deep) and the littoral zone (<9m deep). This division was used by TAMS, the consultant for New York State DEC, in the Remedial Investigation for the purpose of characterizing contaminant concentration distribution and toxicity throughout the Onondaga Lake sediments.

This artificially imposed line of demarcation implies a sharp change in sediment 34
concentrations visible in many of the output maps (Figs. 5-2 to 5-27 of the RI). Although 35
the general spatial patterns derived by TAMS for many contaminants are similar to those achieved through our efforts (see Hughes et al. 2002, Figs. 9, 12, 15, 18, 21-1, and 28), the methodologies are quite distinct and provide different results. This is particularly evident for areas of the profundal zone (SMU-8) that are close to the In-Lake Waste Deposit (ILWD). We have found that contamination characteristic of the ILWD (chlorinated benzenes, mercury, and BTEX) extend beyond the 9-meter boundary used by TAMS to separate the profundal and littoral zones.

The methodology employed by TAMS to map contaminants (page 5-7 of the RI) is called Inverse Distance Weighting (IDW). The RI Report explicitly states that the higher the exponent used, the less influence distant known values will have in generating a value for locations of unknown contamination concentration. A search window of 500 meters is used, but values outside the zone of interest are excluded. Thus, when evaluating cores inside the profundal zone, the data set employed by IDW does not truly represent a 500 m radius sample because data values located on the other side of the 9-meter line are ignored. For example, suppose a sediment core (call it "S1") is taken at 8.8 meters water depth at a location where the benthic surface is rapidly falling. The values assigned to unsampled cells that are perhaps only 3 meters away horizontally, but in 9.1 meters water depth, will be assigned a value based on a core located as far away as 500 meters because it is in the profundal zone. The result is that the high contaminant levels detected only a short distance from that location within the littoral zone (S1) are given no weight as they should be.

The RI Report (page 5-10) states (based on actual measured core values) "As shown in the cross sections, large volumes of mercury-contaminated sediments exist along the shoreline near Harbor Brook (Section A) and Ninemile Creek (Section D) to a distance over 500 m into the lake." Although the RI Report states that IDW was used to extrapolate data values to non-sampled sediment locations, the plots used in support of the proposed remediation, i.e. those that appear in the FS (e.g. Fig. N.1. showing surface sediment mercury concentrations) appear to have been created using Thiessen Polygons as the limiter for extrapolating data points. This method draws lines equidistant between sample points and applies concentration values to all areas inside the polygon defined by those lines. The 9-meter line always appears as one polygon delimiter. If this method was employed we again point to its artificiality and the probability that sediments in the profundal zone have much higher concentration values than depicted in Figure N.1 of the FS.

36 We employed the geostatistical procedure known as kriging to map contaminants in Onondaga Lake. This is generally accepted among spatial analysts as the optimal spatial predictor. It is admittedly a complex and very time-consuming procedure, which may explain its lack of use by TAMS. However, TAMS consultants state on page 5-8 "It is important to note that a geostatistical analysis (i.e., kriging) is required to accurately determine the volume of sediment to be remediated in the FS. This was demonstrated for mercury in Appendix I of this RI, in which areas with high probabilities of exceeding a site-specific probable effect concentration were delineated." So even the analysts, upon whose work the feasibility analysis is based, assert that kriging is necessary in order to accurately characterize the extent of contamination.

Figure 9 of Appendix I was created by TAMS using kriging, but only with cores located in the profundal zone. Again, this pre-determination of contaminant distribution is not an appropriate application of kriging, and cannot possibly represent the true distribution of the lake bottom contaminants. The map illustrates the probability that mercury concentrations in this zone exceed the PEC. Over much of the profundal sediment surface that probability is greater than 80%, yet Figure 5-2 of the RI leaves the impression that surface sediments in the profundal zone are considerably less
37 contaminated than those in the neighboring littoral zone. We have not spoken with TAMS consultants to determine why they employed this artificial line. One is led to suspect, however, that the demarcation was employed from the beginning with the intent of limiting the area from which sediments might have to be removed. We cannot, therefore, support the plan to remove sediment only in those areas falling within the 9 meter depth contour. Our kriging analysis and toxicity analysis give a more accurate delineation of the most impacted zones of the lake's surface sediments.[1] **The results of our analysis, with the 9-m contour, are shown in Figures 1 – 5, attached.**

<u>Organic Carbon</u>

38 Another area of concern is that a uniform sediment organic carbon value of 5% was applied across the lake. The RI Report states "However, these contours should not be considered exact for the purposes of identifying areas that present unacceptable risks." We have calculated, to the best degree possible, the variation in organic content across the lake explicitly in order to identify areas that represent unacceptable risks. In our report, we found that roughly one-half of the lake sediment surface could be kriged for organic carbon. The approach should be applied to identify those areas that represent unacceptable risks. Otherwise, why bother with a spatial characterization of the lake sediment contaminant concentrations? Again, upon examination of our surface sediment plots one sees that there are several areas of the profundal zone where contaminant levels reach 1 – 50 times the toxicity threshold or severe effects level (for Mercury). If our goal is a clean lake, the profundal zone cannot be ignored.

---

[1] See Appendix A, Figure 5

Distribution of Data

Finally, the selection of the bins for representing contamination levels is described as follows: "Based on the large range of values and the typical log-normal nature of contaminant data, contour intervals, or bins, were selected at either half-or one-log step. The number of bins for each map was limited to about eight, and in cases where more bins were required at the half-log step interval, a full log step interval was used instead. When applicable, the half-log or log step contour intervals were (LEL) and severe effect level (SEL) criteria for metal CPOIs (NYSDEC, 1999)." The bins under represent the toxicity levels found in the lake's sediments. TAMS selected their methodology based on "the typical log-normal nature of contaminant data" but no literature reference is given upon which to base this statement. Clearly they have not based it on the actual distribution of this data. We have analyzed the distribution of concentrations for each contaminant or contaminant class, and found that, in some cases, log transformation is appropriate, but in others (e.g. mercury, PAHs) a power-law transformation worked best. 39

Figure 1. Onondaga Lake predicted mercury contamination showing 9-meter contour.
(Severe effects level = 1.3 mg/kg.)

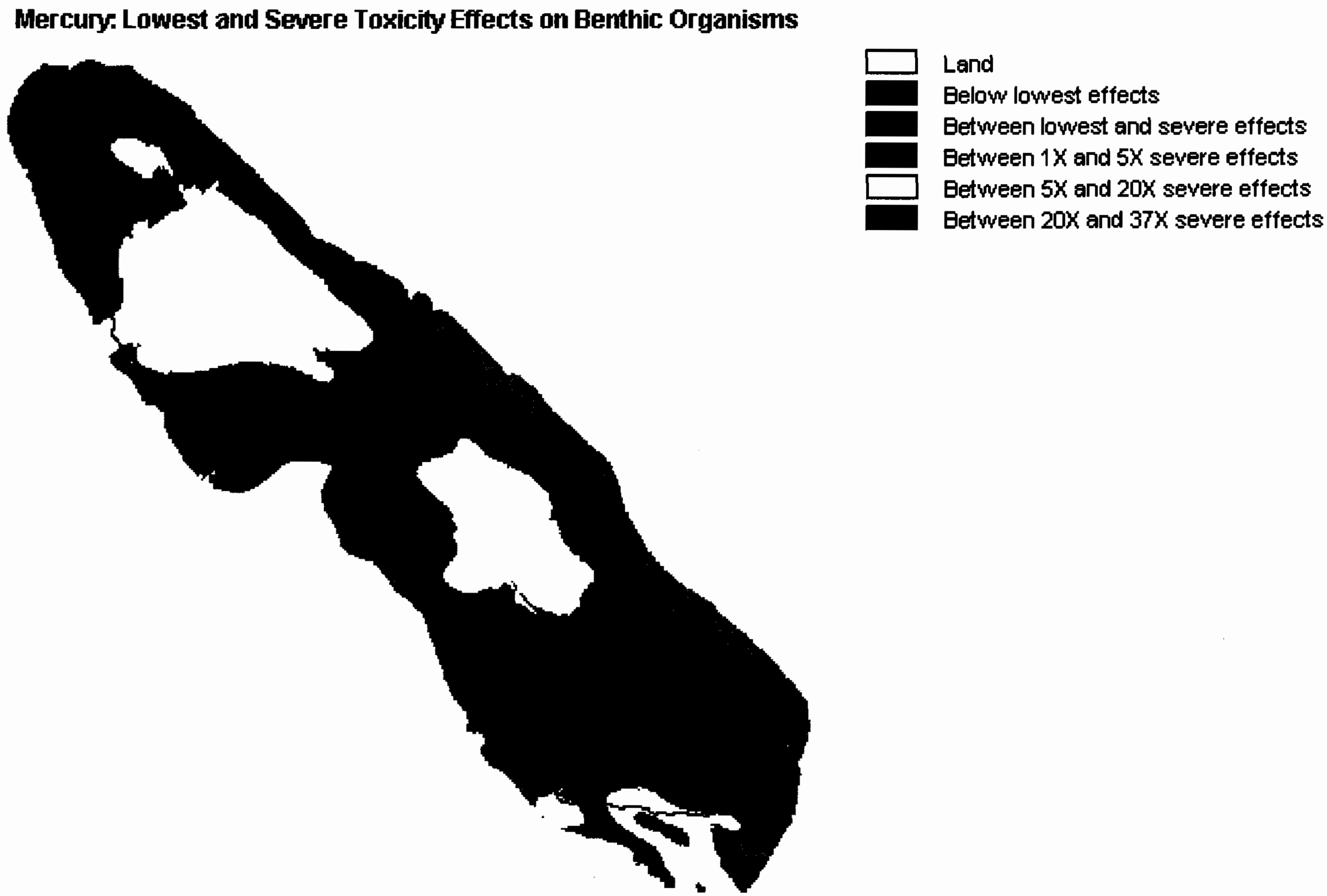


Figure 2. Onondaga Lake predicted dichlorobenzenes contamination showing 9-meter contour. Concentrations are given as factor of chronic screening level = 12 μg/g organic carbon.

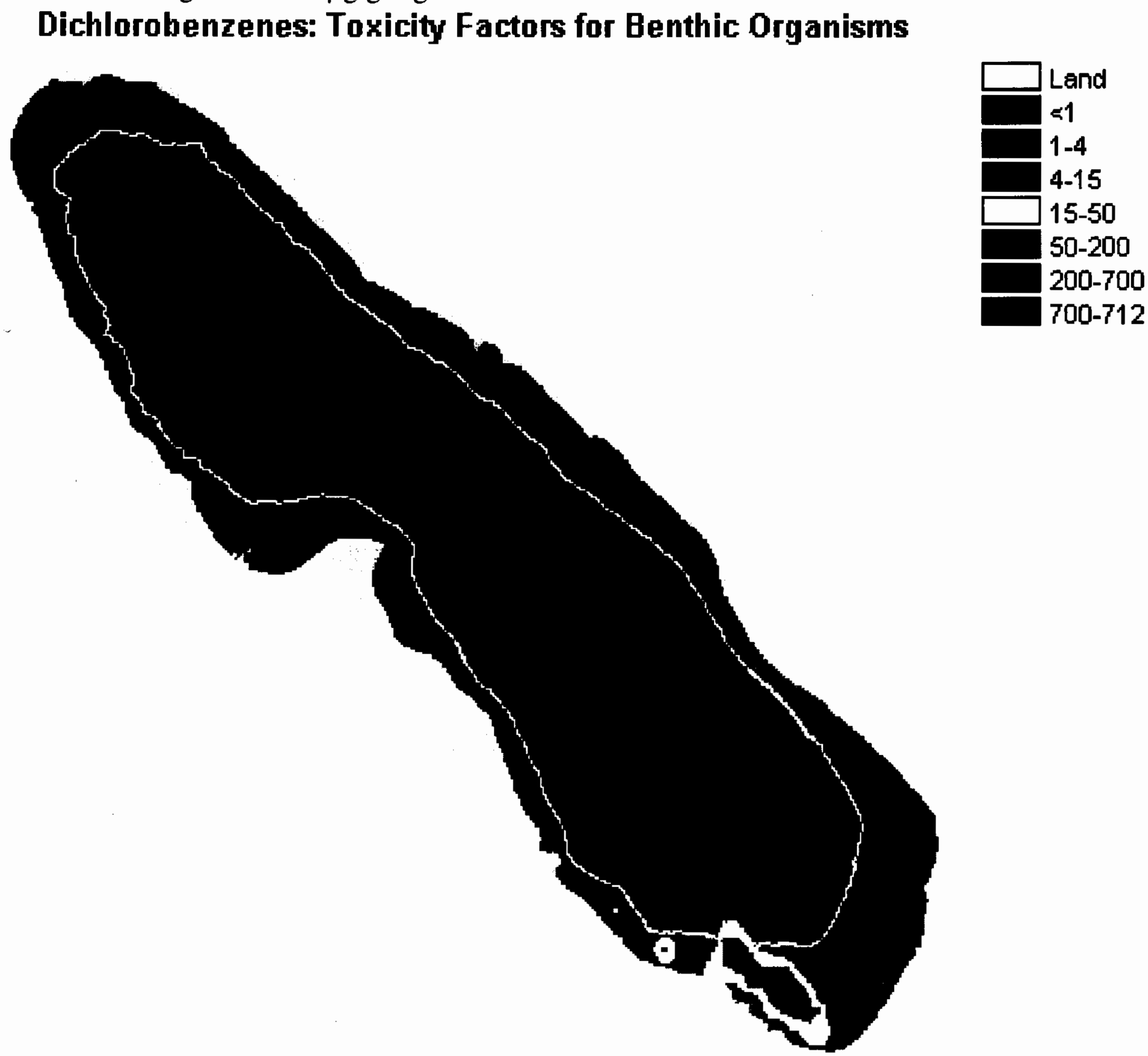


Figure 3. Onondaga Lake predicted chlorobenzene contamination showing 9-meter contour. . Concentrations are given as factor of chronic screening level = 3.5 μg/g organic carbon.

Monochlorobenzenes: Toxicity Factors for Benthic Organisms

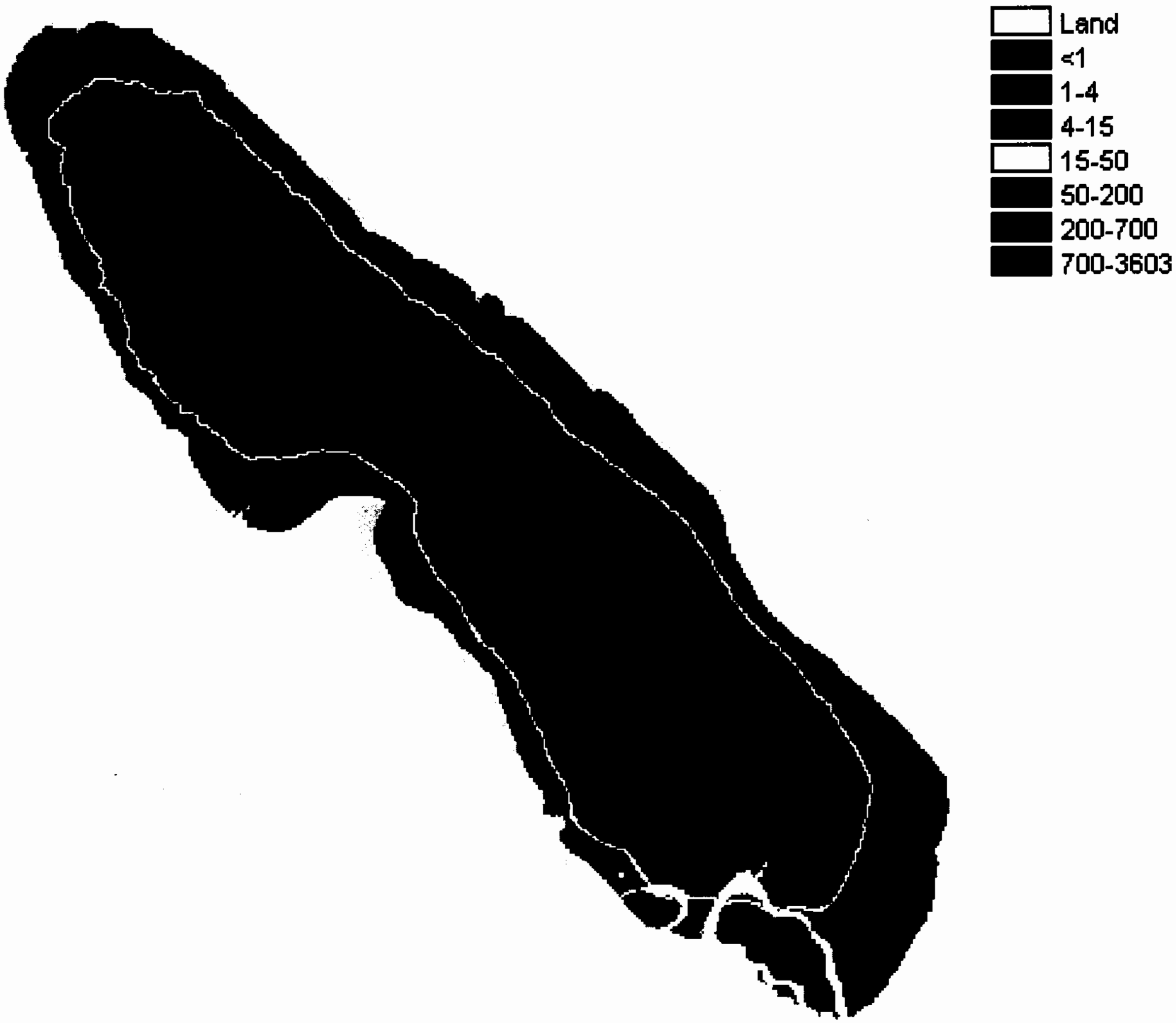


Figure 4. Onondaga Lake predicted PCB contamination showing 9-meter contour. Concentrations are given as factor of chronic screening level = 19.3 μg/g organic carbon.

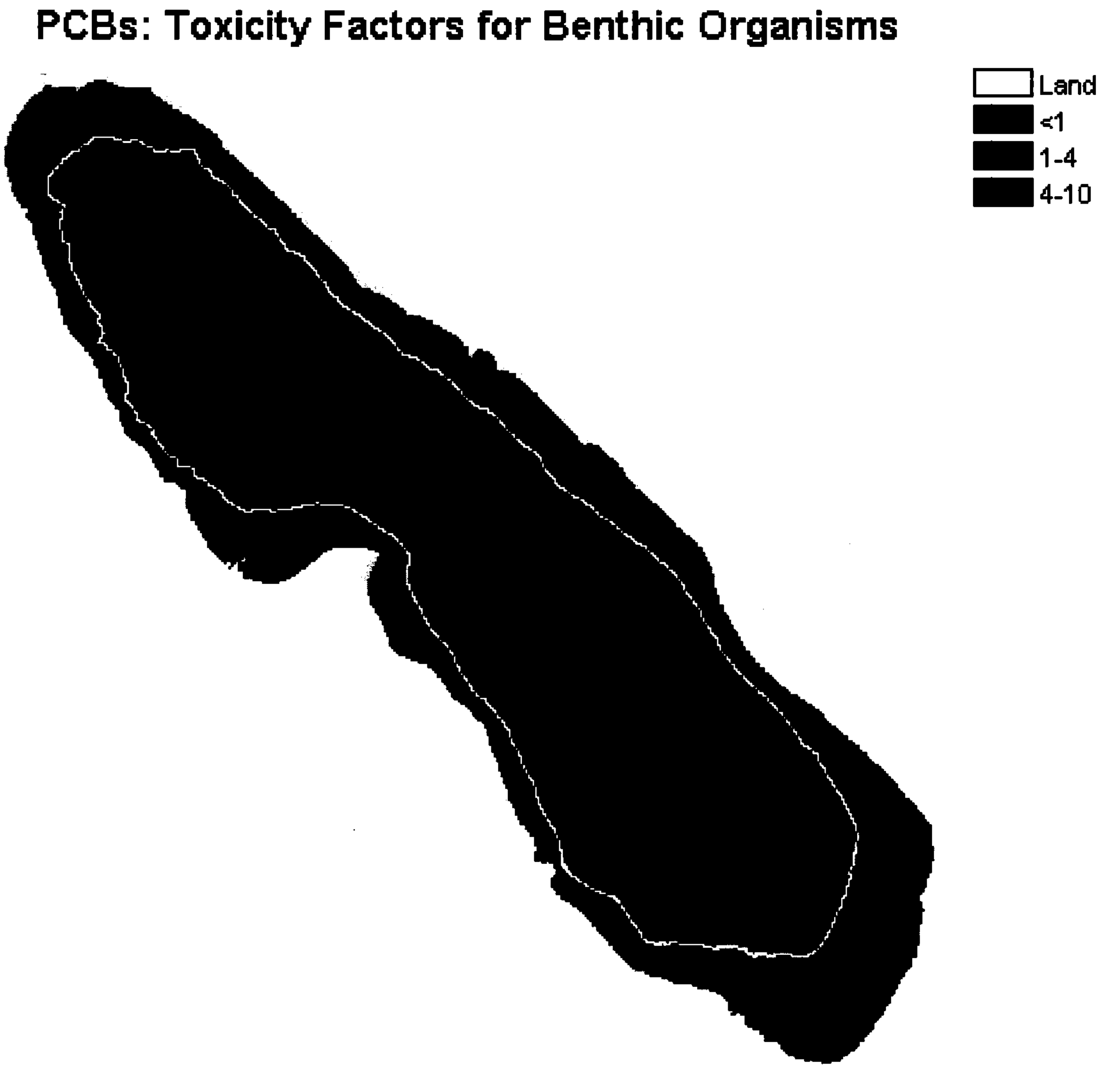
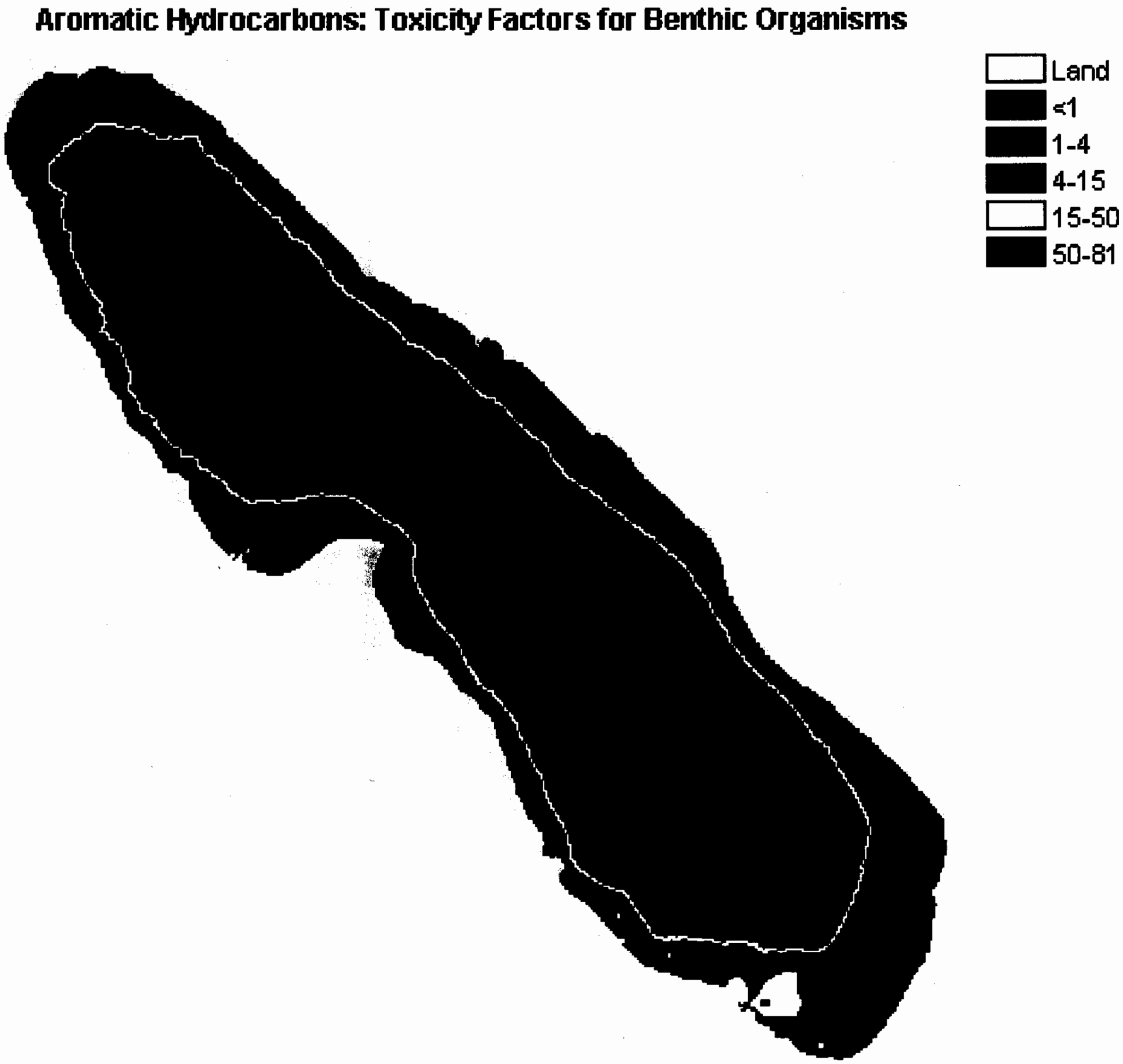


Figure 5. Onondaga Lake predicted BTEX contamination showing 9-meter contour. Concentrations are given as the sum of factors of chronic screening levels for benzene, toluene, xylenes, and ethylbenzene



APPENDIX C