
**ONONDAGA LAKE PRE-DESIGN INVESTIGATION:
PHASE V WORK PLAN
ADDENDUM 3: POREWATER**

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TABLE OF CONTENTS

	Page
LIST OF ACRONYMS	ii
1.0 INTRODUCTION	1
2.0 OBJECTIVES.....	1
3.0 MOBILIZATION AND LOGISTICS	1
4.0 POREWATER INVESTIGATION	2
4.1 Sampling.....	2
4.2 Processing and Analysis	3
5.0 DATA MANAGEMENT AND REPORTING	3
5.1 Field Database	3
5.2 Quality Assurance/Quality Control (QA/QC).....	3
5.3 Sample Holding, Collection, and Recordkeeping	4
5.4 Data Validation and Reporting.....	4
6.0 REFERENCES	4

LIST OF TABLES

Table 1 Porewater Vibracore Sample Locations and Analyses

LIST OF FIGURES

Figure 1 Location of Onondaga Lake

Figure 2 Proposed Porewater Sampling Locations: Remediation Area A

Figure 3 Proposed Porewater Sampling Locations: Remediation Area B

Figure 4 Proposed Porewater Sampling Locations: Remediation Area C

Figure 5 Proposed Porewater Sampling Locations: Remediation Area E

LIST OF ACRONYMS

ILWD	In-lake Waste Deposit
JAS	Job Safety Analysis
MA	Model Area
NYSDEC	New York State Department of Conservation
PDI	Pre-Design Investigation
PSP	Project Safety Plan
QA/QC	Quality Assurance/Quality Control
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SSP	Subcontractor's Safety Plan
TCLP	Toxicity Characteristic Leaching Procedure
VOA	Volatile Organic Analysis

**PHASE V PDI WORK PLAN
ADDENDUM 3: POREWATER****1.0 INTRODUCTION**

This addendum describes the additional porewater data to be collected as part of the Phase V Pre-Design Investigation (PDI) for Onondaga Lake. Since this scope was not identified in the Phase V PDI Work Plan, the sample locations and details of the additional analyses are described in this document. Unless otherwise stated, the activities described in this addendum will be conducted in accordance with the procedures outlined in the Phase I - V PDI Work Plans and associated appendices (Parsons 2005, 2006, 2007, 2008 and 2009a). This addendum describes porewater sampling activities required to fill data gaps and refine remediation area boundaries as identified in the design development.

2.0 OBJECTIVES

The primary purpose of the work described in this addendum is to increase porewater data density for use in chemical isolation layer modeling as well as to refine the modeling area boundaries in remediation areas A and E by filling data gaps. The specific objectives for data collection in remediation areas A, B, C and E are provided in Section 4.

The specific tasks required to meet these objectives are described in Sections 4 and 5.

3.0 MOBILIZATION AND LOGISTICS**Health and Safety**

Parsons ranks health and safety as its highest priority. Parsons' Project Safety Plan (PSP) and our Subcontractor's Safety Plans (SSPs) prepared for the Phase V PDI cover activities under this Work Plan and will be strictly followed by all personnel. Any task outside of the current scope defined in the PSP will have a new Job Safety Analysis (JSA) completed before the task begins. Copies of the PSP and SSPs will be maintained at the support zone and on each vessel.

Site Facilities, Decontamination, and Waste Handling

The support zone and facilities in place for the ongoing Phase V PDI will be used for porewater sampling. All decontamination and waste management activities will be conducted in accordance with Phase I PDI Work Plan (Parsons, 2005).

4.0 POREWATER INVESTIGATION

4.1 Sampling

A total of 30 porewater cores and 30 raw sediment cores (collocated with the porewater cores) will be collected in Remediation Areas A, B, C and E using vibracore techniques in accordance with the procedures outlined in the Phase I PDI Sampling and Analysis Plan (SAP) (Parsons, 2005). Following extraction, each core will be cut into 2 ft intervals, capped, sealed, and shipped to the lab for processing. Samples will be collected to depths of between 10 and 12 ft in remediation area A and to 10 ft in remediation areas B, C, and E. Proposed sample depths are based on collection of at least two intervals below criteria exceedance depths from previous sample locations in the vicinity of the proposed locations. Specific objectives in Remediation Areas A, B, C and E are given below:

Remediation Area A (Figure 2): Remediation Area A has been divided into model areas A1 (MA-A1) and A2 (MA-A2) for chemical isolation layer modeling purposes due to the relatively higher porewater concentrations observed at the mouth of Ninemile creek (Parsons, 2009b).

- Sample locations selected to potentially refine the boundary between model areas MA-A1 and MA-A2 and to further define porewater concentrations in and in the vicinity of MA-A2.

Remediation Area B (Figure 3):

- Sample locations selected to increase porewater data density for use in chemical isolation layer modeling.
- Pending receipt and review of Phase V sediment data, additional porewater sample locations may be warranted for the western cap area. The need for additional sampling will be discussed with DEC and addressed (if needed) as a follow-up to this porewater investigation effort.

Remediation Area C (Figure 4):

- Sample locations selected to increase porewater density in north-western area of RA-C for use in chemical isolation layer modeling. Samples will also be collected in steeply sloped areas in the event that dredging near shore becomes infeasible.

Remediation Area E: Remediation Area E has been further divided into model areas E1 (MA-E1) and E2 (MA-E2) for modeling purposes due to the relatively higher porewater concentrations observed in Remediation area E immediately adjacent to the in-lake waste deposit (ILWD), as shown in Figure 5 (Parsons, 2009b).

- Sample locations selected to refine modeling area boundary between MA-E1 and MA-E2 and to further define porewater concentrations in and in the vicinity of MA-E2.

4.2 Processing and Analysis

The cores collected during this portion of the Phase V PDI will be processed and analyzed in accordance with the Phase IV PDI Work Plan and standard operating procedures (SOPs) (Parsons, 2008):

- The cores will be maintained upright until the sections are measured, cut, capped, and labeled in the field before shipment to the lab. The cores will be cut, capped, and labeled on the sampling vessel.
- Lake water on top of the cores will be decanted before the core is capped. Any fluid that separates from the sediment within the core during sample shipment will be considered porewater and included in the analysis. Due to this modification, samples do not need to be kept vertical prior to processing.
- The centrifugation process will be conducted in a refrigerated environment to minimize volatilization.
- The dissolved fraction of the porewater generated from these cores will be analyzed. For the dissolved porewater fraction, the non-volatile parameters (Hg, TOC, and pH) will be pressure filtered through 0.7 μm toxicity characteristic leaching procedure (TCLP) filtration paper. The volatiles will be centrifuged for 10 minutes and decanted into pre-preserved volatile organic analysis (VOA) vials.

5.0 DATA MANAGEMENT AND REPORTING

5.1 Field Database

The Phase V database will be used to ensure consistency in field sample ID assignment and compatibility with the Locus Focus data management system. The data collection program will be similar to the ones used during previous phases of the PDI program. The database will be operated by trained Anchor/QEA or Parsons' personnel.

5.2 Quality Assurance/Quality Control (QA/QC)

Field QA/QC will consist of the collection and analysis of field duplicates, and matrix spike/matrix spike duplicate samples in accordance with the Phase I PDI Work Plan (Parsons, 2005). Since most of the samples will be collected from dedicated tubes/liners, rinse blanks will be collected at a rate of one per batch of dedicated sampling equipment. All field QA/QC samples will be identified using standard sample identifiers and collected in accordance with the Phase I PDI Work Plan (Parsons, 2005).

5.3 Sample Holding, Collection, and Recordkeeping

Samples will be collected and handled according to the procedures outlined in the Phase I PDI Work Plan and associated appendices. Samples will be managed by the field database as described above. All sample recordkeeping and database entry (Locus Focus) will be conducted in accordance with the Phase I PDI Work Plan (Parsons, 2005).

5.4 Data Validation and Reporting

Analytical data generated during this investigation will be reviewed and validated in accordance with the Phase I PDI Work Plan (Parsons, 2005). The results will be incorporated into the Locus Focus database following validation.

Upon completion of the Phase V PDI field activities and laboratory analyses, Parsons will submit unvalidated and validated data to New York State Department of Conservation (NYSDEC) in accordance with the Consent Decree for the lake. Once the Phase V investigation and evaluation has been completed, a data summary report will be prepared and submitted to NYSDEC.

6.0 REFERENCES

- Parsons, 2004, Onondaga Lake Feasibility Study Report, Onondaga County, New York. Prepared for Honeywell, Morristown, New Jersey. Syracuse, New York.
- Parsons, 2005, Onondaga Lake Pre-Design Investigation: Phase I Work Plan and Appendices. Prepared for Honeywell, Morristown, New Jersey. Syracuse, New York.
- Parsons, 2006, Onondaga Lake Pre-Design Investigation: Phase II Work Plan and Addenda. Prepared for Honeywell, Morristown, New Jersey. Syracuse, New York.
- Parsons, 2007, Onondaga Lake Pre-Design Investigation: Phase III Work Plan and Addenda. Prepared for Honeywell, Morristown, New Jersey. Syracuse, New York.
- Parsons, 2008, Onondaga Lake Pre-Design Investigation: Phase IV Work Plan and Addenda. Prepared for Honeywell, Morristown, New Jersey. Syracuse, New York.
- Parsons, 2009a, Onondaga Lake Pre-Design Investigation: Phase V Work Plan and Addenda. Prepared for Honeywell, Morristown, New Jersey. Syracuse, New York.
- Parsons, 2009b, Sediment Cap Modeling: Memorandum to NYSDEC. Prepared for Honeywell, Morristown, New Jersey. Syracuse, New York.

TABLES

HONEYWELL

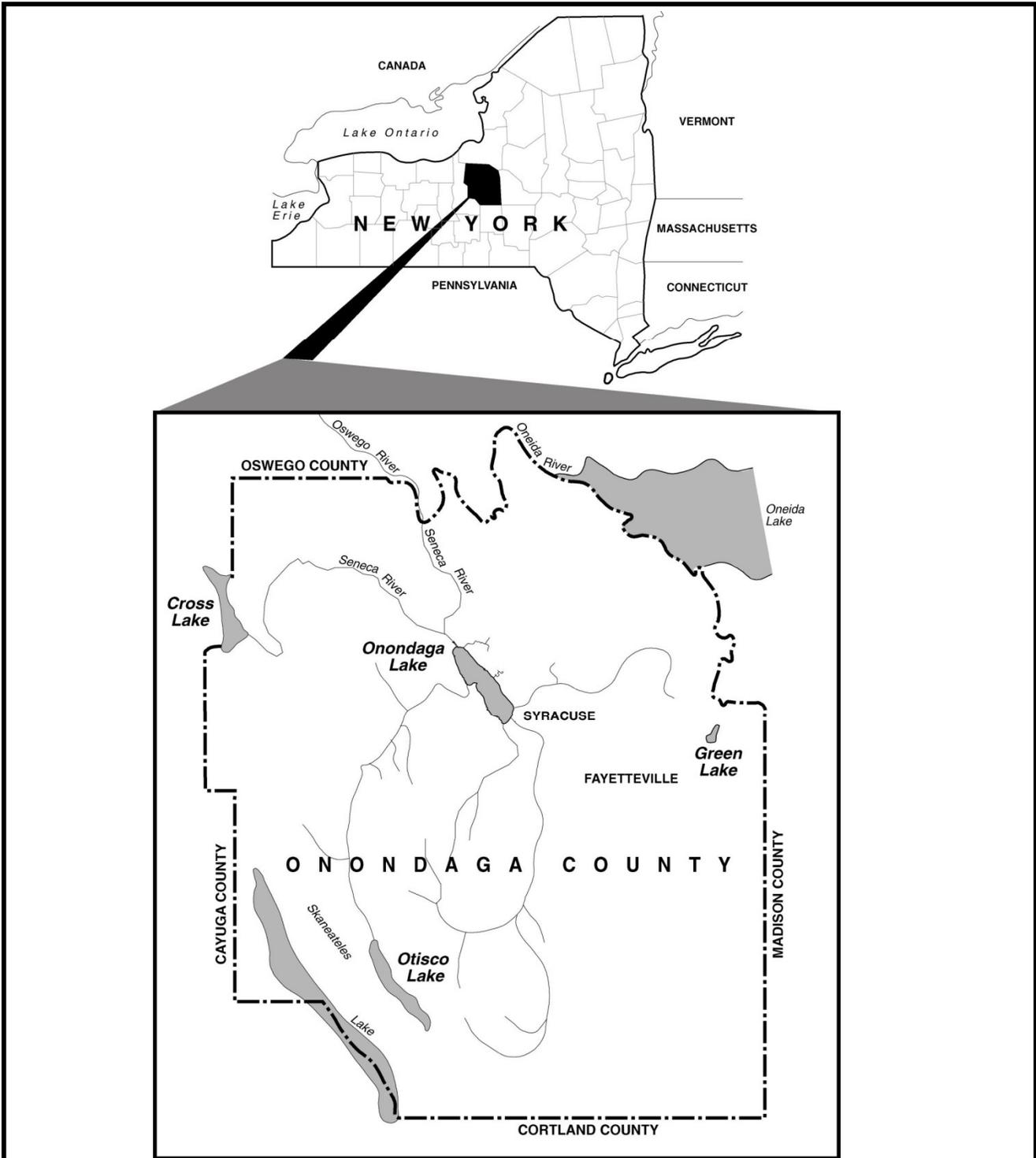
TABLE 1
Onondaga Lake Phase V PDI Addendum 3:
Porewater Vibracore Sample Locations and Analyses

Remediation Area							Analyses					
Map Symbol	Number of Locations	Number of Intervals	Sampling Intervals (ft)	Location	Total Depth (ft)	Mercury (7470A/7471A)	VOCs(CPOIs) ¹ (8260B)	pH (9045C/9040C)	DOC/TOC (SM 5310B/Lloyd Kahn)	Percent Moisture ²	Specific Gravity ²	
A	▲	9	5	2-ft intervals from top of core	OL-VC-40257, 40258, 40261, 40262, 40263, 40264, 40265, 40266, 40267	10	Number of Samples					
							Porewater	45	45	45	45	
	Raw Sediment	45	45	45	45	45	45					
	▲	6	6	2-ft intervals from top of core	OL-VC-40254,40255, 40256, 40259,40260, 40268	12	Porewater	36	36	36	36	36
							Raw Sediment	36	36	36	36	36
							Porewater	25	25	25	25	
							Raw Sediment	25	25	25	25	25
	▲	5	5	2-ft intervals from top of core	OL-VC-30134, 30135, 30136, 30137, 30138	10	Porewater	20	20	20	20	20
							Raw Sediment	20	20	20	20	20
							Porewater	20	20	20	20	20
Raw Sediment							20	20	20	20	20	
▲	4	5	2-ft intervals from top of core	OL-VC-20192, 20193, 20194, 30139	10	Porewater	30	30	30	30		
						Raw Sediment	30	30	30	30		
						Porewater	30	30	30	30		
						Raw Sediment	30	30	30	30	30	
▲	6	5	2-ft intervals from top of core	OL-VC-60262, 30263, 70140, 70141, 70142, 70143	10	Porewater	30	30	30	30	30	
						Raw Sediment	30	30	30	30	30	
						Porewater	30	30	30	30	30	
						Raw Sediment	30	30	30	30	30	

Notes:

1. CPOI list for VOCs includes benzene; chlorobenzene; m- and p-xylenes; o-xylene; total xylenes; ethylbenzene; naphthalene; toluene; 1,3,5-trichlorobenzene; 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; 1,2,3-trichlorobenzene; 1,2,4-trichlorobenzene.
2. Porosity of the raw sediment will be calculated from the percent moisture and specific gravity.

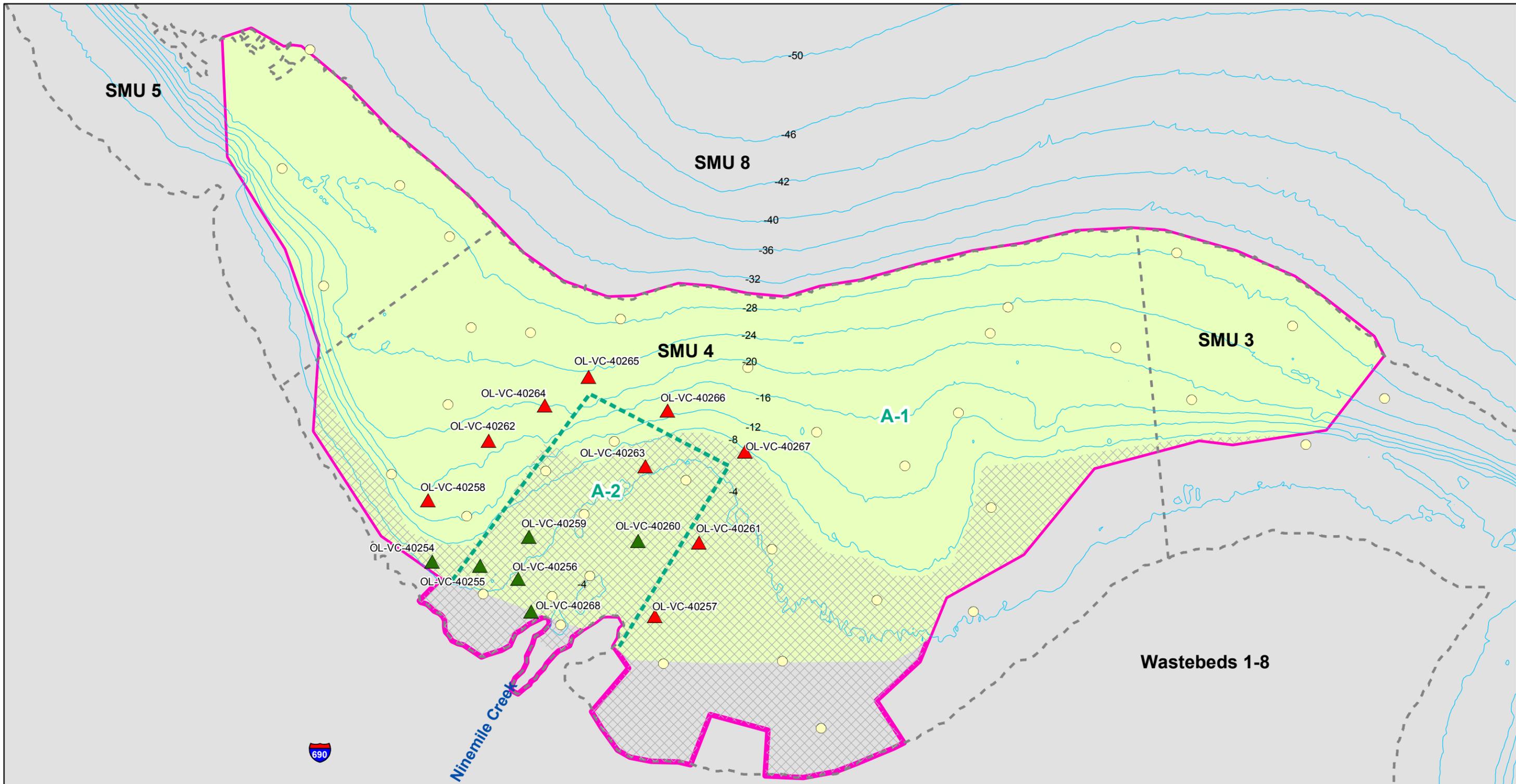
FIGURES



Source: Modified from TAMS 2002c.

FIGURE 1	
Honeywell	ONONDAGA LAKE SYRACUSE, NEW YORK
LOCATION OF ONONDAGA LAKE	
PARSONS	
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Proposed Phase V PDI Sample Locations

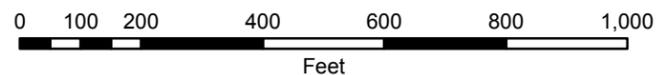
- ▲ 10 ft. Vibracore
- ▲ 12 ft. Vibracore

NOTES

1. Bathymetry contours are in 4 foot intervals.
2. Water depth based on average lake elevation of 362.82 feet, NAVD88.

Historical Sample Locations (RI to Phase IV PDI)

- Historical Porewater Location



- Preliminary Potential Remediation Area- Final Delineation to be Determined
- Preliminary Dredge Area
- Preliminary Cap Area
- Cap Model Area - Cap area within boundaries is Cap Model Area A-2; cap area outside of boundaries is Cap Model Area A-1.
- SMU Boundaries



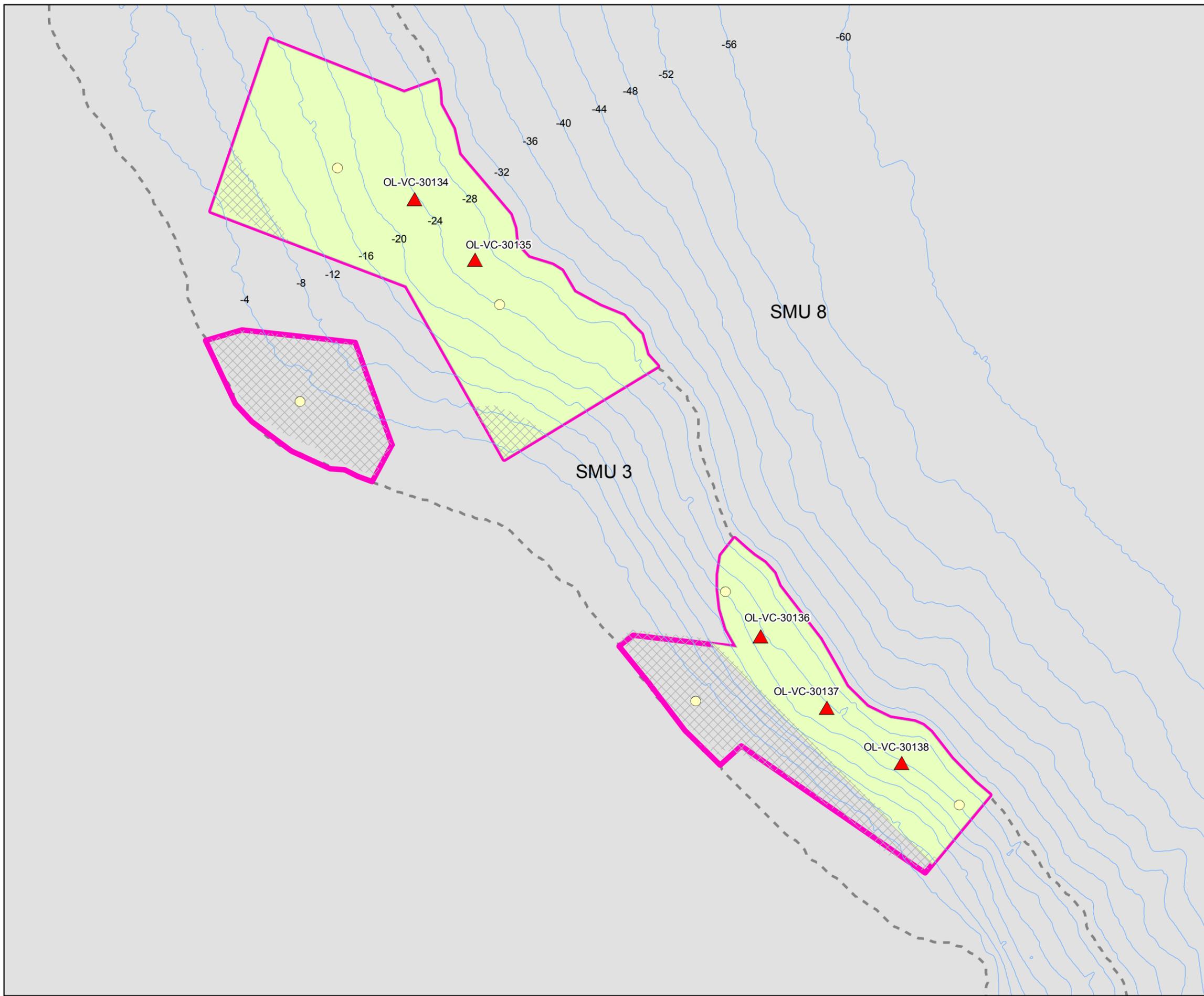
FIGURE 2

Honeywell Onondaga Lake
Syracuse, New York

Phase V PDI Addendum 3
Proposed Porewater Sampling Locations
Remediation Area A

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**Proposed Phase V PDI
Sample Locations**



▲ 10 ft. Vibracore

**Historical Sample Locations
(RI to Phase IV PDI)**

● Historical Porewater Location

- Preliminary Potential Remediation Area-
Final Delineation to be Determined
- Preliminary Dredge Area
- Preliminary Cap Area
- SMU Boundaries

NOTES

1. Bathymetry contours are in 4 foot intervals.
2. Water depth based on average lake elevation of 362.82 feet, NAVD88.

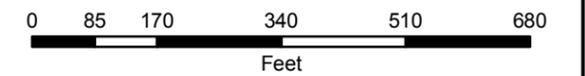


FIGURE 3

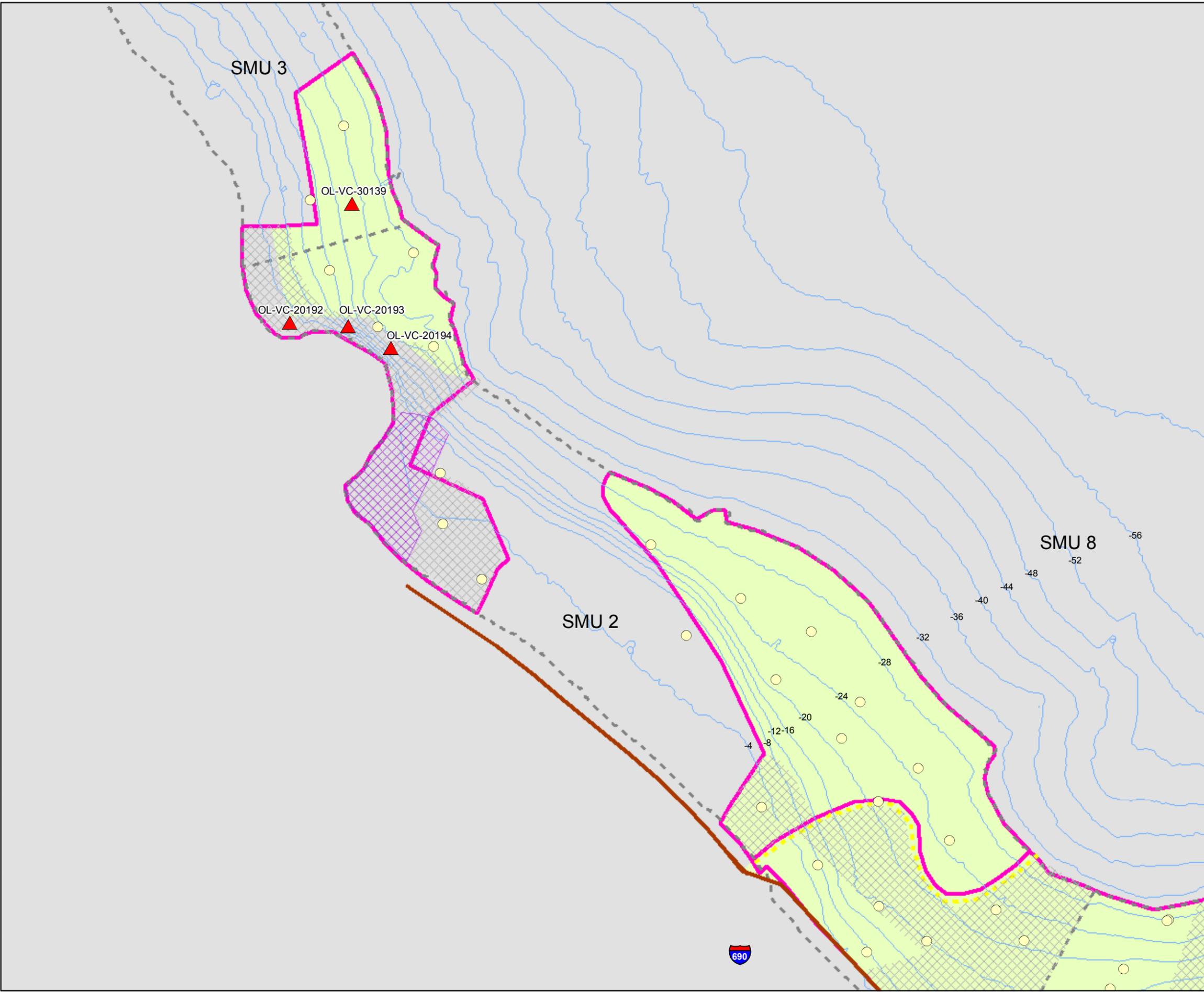
Honeywell Onondaga Lake
Syracuse, New York

Phase V PDI Addendum 3
Proposed Porewater Sampling Locations
Remediation Area B

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**Proposed Phase V PDI
Sample Locations**

▲ 10 ft. Vibracore

**Historical Sample Locations
(RI to Phase IV PDI)**

● Historical Porewater Location

- Preliminary Potential Remediation Area-Final Delineation to be Determined
- Preliminary Dredge Area
- Preliminary Cap Area
- Area with Wooden Pilings
- ILWD Boundary
- Willis/Semet IRM Barrier Wall
- SMU Boundaries

NOTES

1. Bathymetry contours are in 4 foot intervals.
2. Water depth based on average lake elevation of 362.82 feet, NAVD88.



FIGURE 4

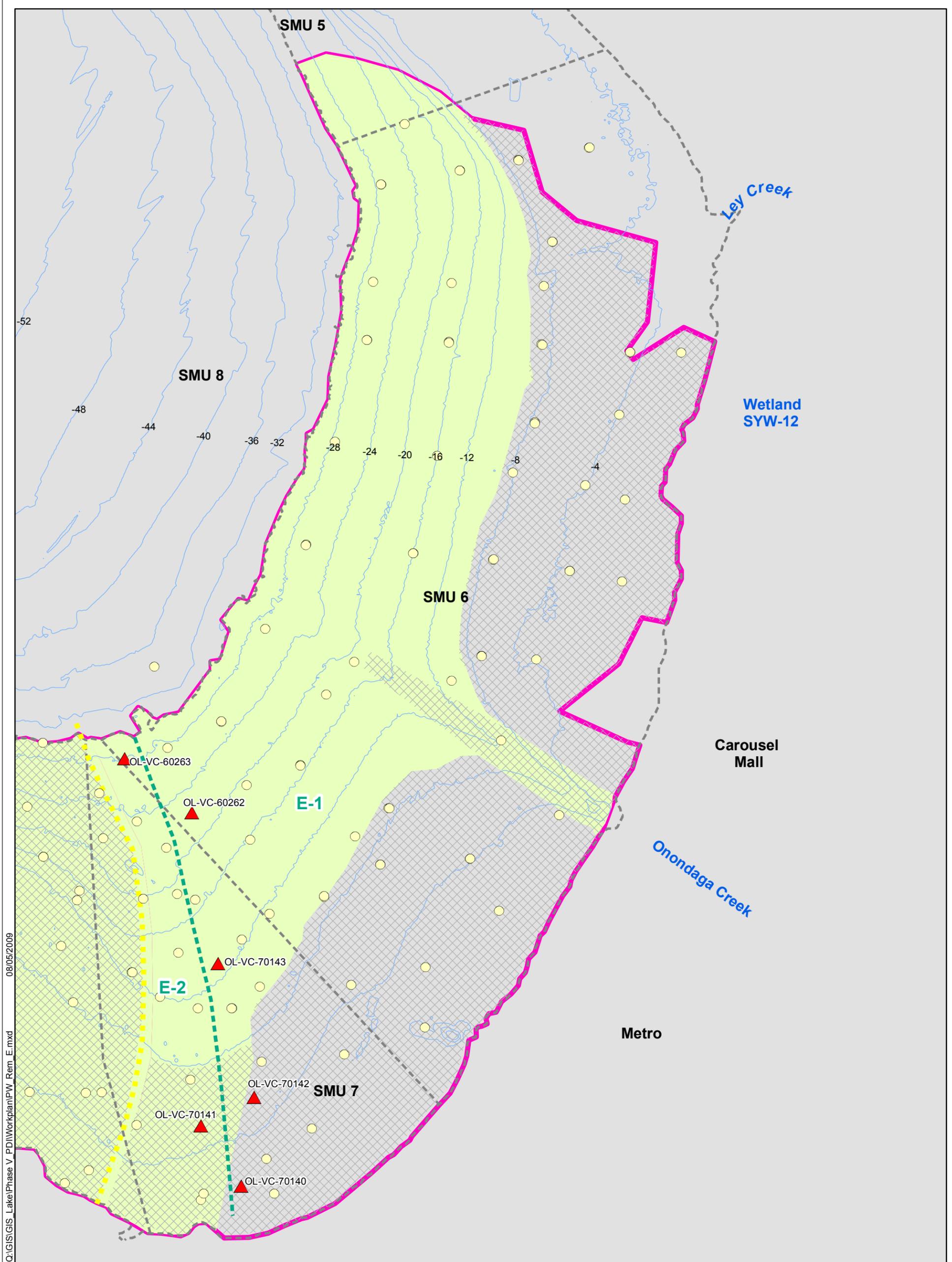
Honeywell Onondaga Lake
Syracuse, New York

Phase V PDI Addendum 3
Proposed Porewater Sampling Locations
Remediation Area C

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Proposed Phase V PDI Sample Locations

▲ 10 ft. Vibracore

Historical Sample Locations (RI to Phase IV PDI)

● Historical Porewater Location

NOTES

1. Bathymetry contours are in 4 foot intervals.
2. Water depth based on average lake elevation of 362.82 feet, NAVD88.

-  Preliminary Potential Remediation Area-Final Delineation to be Determined
-  Preliminary Dredge Area
-  Preliminary Cap Area
-  Cap Model Area
-  Extent of ILWD
-  SMU Boundaries



FIGURE 5

Honeywell Onondaga Lake
Syracuse, New York

Phase V PDI Addendum 3
Proposed Porewater Sampling Locations
Remediation Area E

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