ONONDAGA LAKE PRE-DESIGN INVESTIGATION: PHASE II WORK PLAN

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1.0 INTRODUCTION

Onondaga Lake is a 4.6-mi^2 (2900-acre) lake located northwest of the City of Syracuse in central New York State (Figure 1). The Lake, its tributaries, and the upland hazardous waste sites related to the Lake that were affected by former Honeywell operations have been identified as a federal Superfund site on USEPA's National Priorities List (CERCLIS NYD986913580). A remedial investigation (RI) was completed in 2002, a feasibility study (FS) was completed in November 2004, and the Phase I Pre-Design Investigation (PDI) was completed in 2005 for Onondaga Lake. Additional investigation and design efforts are now required to move forward with the selected remedial actions. Additional details regarding the site can be found in the FS (Parsons, 2004).

NYSDEC and USEPA issued a Record of Decision (ROD) on July 1, 2005 that describes the selected remedy for Onondaga Lake. Primary components of the remedy, as detailed in the ROD, are dredging, isolation and thin-layer capping, monitored natural recovery (MNR), sediment placement and consolidation in an upland sediment consolidation area (SCA), water treatment, oxygenation pilot testing, and habitat enhancements.

Before any of these measures are implemented, additional information is required to allow detailed design of the remedy. This additional information will be collected as part of a phased PDI approach. This document is the Phase II PDI Work Plan and describes the tasks related to the Phase II PDI. The Phase II field work began on August 7th, 2006 and is anticipated to be complete by the end of 2006. A third phase of the PDI may be required following completion of Phase II activities.

In the fall of 2005, Honeywell conducted the first phase of the PDI for the Onondaga Lake remedy. This investigation was conducted in accordance with the NYSDEC approved work plan (Parsons, 2005). All Phase II samples will be collected in accordance with the procedures outlined in the Phase I PDI Sampling and Analysis Plan (SAP), Quality Assurance Project Plan (QAPP), Project Safety Plan (PSP), and Standard Operating Procedures (SOPs).

2.0 PROJECT OBJECTIVES

The purpose of the Phase II PDI is to collect information required to conduct remedial design activities. Several investigation activities requested by NYSDEC during the Phase I PDI were deferred to Phase II as a result of task prioritization. Additionally, several data evaluation activities have begun using the information obtained during the Phase I investigation. The scope of the Phase II PDI was determined by revisiting the tasks deferred from Phase I and additional data needs required to progress design related activities. This information will be combined with the existing data set for use during design.

3.0 OVERVIEW OF FIELD WORK ACTIVITIES

The Phase II scope of work includes chemical and geotechnical characterization of sediment using a variety of sampling techniques. A summary of the Phase II tasks and objectives is outlined in Table 1. Each task is summarized in more detail in subsequent sections of this work plan.

4.0 MOBILIZATION AND LOGISTICS

Health and Safety

Parsons ranks health and safety as the highest priority. Parsons' PSP and our Subcontractors' Safety Plans prepared for previous lake work will be used for this investigation and will be strictly followed by all personnel. Any new task outside of the current scope defined in the PSP will have a new Activity Hazard Analysis (AHA) completed before the task begins. Copies of the safety plans will be maintained at the support zone and on each vessel. Each vessel will have the ability to communicate with land-based services by cell phone and marine VHF radio.

Site Facilities

The support zone and facilities established during the Phase I PDI will be used for the Phase II investigation.

Decontamination and Waste Handling Facility

The onshore facility established during the Phase I PDI to decontaminate equipment and manage waste will also be used during the Phase II PDI. All decontamination and waste management activities will be conducted in accordance with Phase I documents and field procedures.

5.0 SEDIMENT INVESTIGATION

Surface and subsurface sediments will be collected and processed using the same methods as the Phase I PDI to obtain representative samples for geotechnical and chemical analyses. A summary of the investigation tasks, objectives, general locations, and primary activities is provided in Table 1. The details regarding the sampling and analyses are described in the following subsections and on Table 2 and Figures 2 through 9.

5.1 DEEP BORINGS

A total of two deep borings, one each in SMU 1 and SMU 3, will be conducted to assist in refining the layers of the groundwater model and to collect porewater samples to further our understanding of groundwater beneath the lake (Figures 2 and 4, respectively). As noted on Table 2, sediment and porewater samples will be collected from each unit to identify the chemical and geotechnical properties of each strata. These borings will extend approximately 10 ft into the bedrock, which is anticipated to be approximately 150 ft deep.

SOLVAY WASTE

Each boring will be installed by washing a 6-inch casing from the sediment/water interface through the Solvay waste at each location. During advancement of the 6-inch casing, sediment samples will be collected on 5-ft intervals using 3-inch diameter split-spoon to log the borehole.

MARL/SILT

Once the marl/silt layer is reached beneath the Solvay waste, sediment will be collected with a 3-inch split spoon to obtain as much volume as possible. One sediment sample from this unit will be sent to the lab to be centrifuged for porewater and analyzed for the parameters on Table 2. This is intended to establish concentrations in this unit relative to the underlying silt and clay and evaluate the source of the water. A portion of the sediment sample will be analyzed for bulk density, cations and anions prior to centrifugation. If sufficient porewater is generated, it will be filtered and analyzed for salinity, cations and anions.

SILT/CLAY

Once the silt/clay layer is reached, continuous sampling will commence with a 3-inch split spoon or Shelby tube to collect as much sample material as possible for the chemical and geotechnical testing in this unit. Once sampling has extended 5 ft into the silt/clay, a casing will be set to protect the deep zone from any potential impacts from the shallow zone. The casing will be installed and sealed with bentonite prior to commencement of drilling through the casing. Following casing installation, mud-rotary drilling techniques will be used to advance the boreholes to the terminal depth. Drill cuttings that are carried to the surface will be initially contained in the re-circulation tub and transferred to 55-gallon drums as needed.

Continuous split spoon sampling will continue through the silt/clay unit due to the volume requirements and multiple analyses. Three intervals will be selected from this unit and sediment will be sent to the lab to be centrifuged for porewater and analyzed for the parameters listed on Table 2. A portion of the sediment sample will be analyzed for TCL VOCs, bulk density, cations and anions prior to centrifugation process. If sufficient porewater is generated, it will be filtered and analyzed for salinity, cations and anions. These results will be used to generate chloride profiles in the silt/clay layer to identify the amount of flow through this unit and evaluate the source of the water.

Two Shelby tubes collected within this unit for geotechnical purposes will be analyzed for standard consolidation testing to evaluate the compressibility characteristics of this unit. This data will be used to estimate the amount of settlement that would be expected following placement of an overlying cap.

SILT/FINE SAND

Mud rotary drilling will continue into the silt and fine sand unit beneath the silt/clay. Due to the thickness of the fine sand unit, and the time required to conduct sampling at these depths, sediment samples will be collected on 5-ft intervals using 3-inch diameter split spoon samplers to

collect additional as much sample volume as possible. After the casing has been advanced to the bottom of the previous spoon, a Geoprobe® discrete water sampler will be installed to collect porewater samples from this unit. The Geoprobe® sampler has a screened section that is covered by a sealed protective casing that will allow it to pass through the drilling mud without clogging the screen. Porewater will be collected by pushing the probe ~2 ft below the drill casing and retracting the outer casing of the probe to expose the screen. The hydraulic head in this unit may push the porewater up through the Geoprobe® casing above lake level where samples could be collected from the top of the casing. If artesian conditions are present, the Geoprobe® casing will be allowed to flow for several minutes prior to sampling to ensure a representative sample. Porewater samples will be collected on 10-ft intervals in the silt and fine sand unit and analyzed for the parameters identified on Table 2. After the porewater sample is collected the drill casing will be advanced to the next split spoon interval. Sample collection methods may have to be modified based on field conditions at each location and will be discussed with NYSDEC prior to any modification.

In the event that the fine sand/silt unit does not produce water, sediment samples collected from the split spoons will be sent to the lab for centrifugation as noted above. A portion of the sediment sample will be analyzed for TCL VOCs, bulk density, cations and anions prior to centrifugation process. If sufficient porewater is generated, it will be filtered and analyzed for salinity, cations and anions. The results from the porewater and sediment analyses will be used to establish a chloride profile in this unit, help identify the origin of the water, and identify the presence of any VOCs that may be linked to the compounds in the deep aquifer along the shoreline.

SAND AND GRAVEL

Continuous split spoons will commence at 100 ft at OL-STA-10027 and 65 ft at OL-STA-30033 to ensure the sand/gravel and till units, if present, are accurately defined. Following confirmation of the sand/gravel unit, the Geoprobe® sampler will be advanced in the same manner as above to collect porewater samples from this unit. If the sand and gravel unit is greater than 3 ft thick, two porewater samples will be collected with the Geoprobe® and analyzed for the parameters listed on Table 2. Groundwater samples will be collected from this interval for isotopic dating analysis and hydrometer reading for water density in accordance with the Focused Remedial Investigation Work Plan for Wastebeds 1-8 (O'Brien & Gere, 2005.) In the event that the Geoprobe® sampling is not effective, sediment samples will be sent to the lab and centrifuged for porewater. A portion of the sediment sample will be analyzed for TCL VOCs, bulk density, cations and anions prior to centrifugation process. If sufficient porewater is generated, it will be filtered and analyzed for salinity and cations/anions to evaluate the source of the water.

BEDROCK

Following sampling in the sand and gravel unit, continuous split spoons will be collected in the glacial till, if present, until spoon refusal. Once the top of rock has been identified, coring

drilling methods will be used to collect a 10-ft core into the top of the bedrock. Fluids and cuttings brought to the surface will be managed as described above.

Following completion of the rock coring the core will be brought to the surface and logged by the onsite geologist. The packer testing apparatus will be installed after the core is extracted to measure the hydraulic conductivity of the 10-ft interval. The packer assembly will consist of a packer string that includes one single packer mounted to a 1-inch diameter steel pipe that extends to the barge deck. The 10-ft section beneath the packer will be perforated to allow the introduction or withdrawal of water from the packed-off section. The packer string will be lowered into the borehole. Upon reaching the test interval, the packer will be inflated to isolate the test interval from the borehole. The packer will be inflated to the operating inflation pressure specified by the packer manufacturer. The packer seal will be evaluated subsequent to inflation by allowing the packer assembly to hang freely inside the drill casing observing whether the inflated packer can support the weight of the packer assembly.

Groundwater samples will be collected from this interval for analytes listed in Table 2 including isotopic dating analysis and hydrometer reading for water density in accordance with the Focused Remedial Investigation Work Plan for Wastebeds 1-8 (O'Brien & Gere, 2005.)Following completion of all coring and packer testing activities, the borehole will be grouted to the sediment/water interface with a cement-bentonite grout and all casing will be extracted. Information obtained from these borings will help identify the origin of the groundwater and determine if any contamination is present in the bedrock beneath the lake.

5.2 GEOTECHNICAL TESTING

All sediment samples will be placed in one-quart jars and retained onsite until the sampling intervals for disturbed geotechnical analysis have been selected. The approximate number of geotechnical samples has been identified on Table 2. The two Shelby tubes collected from the silt/clay unit will provide additional strength data for this unit, however, additional data will be required from this unit to address other geotechnical concerns pertaining to the lake remedy.

5.3 VIBRACORE SAMPLING

Shallow Vibracore sampling will be conducted in all SMUs to collect sediment for various chemical and geotechnical analyses, as presented in Table 2. Sufficient sample volume will be retained from each sample interval to allow for geotechnical analyses. The intervals selected for geotechnical testing will be determined by a geotechnical engineer following review of the core descriptions. A revised summary table will be provided to NYSDEC prior to conducting any geotechnical analyses. Additional details of the sampling depths and analyses are described in the following subsections.

The geotechnical testing program for the Phase II PDI primarily includes index testing of select sediment samples to evaluate subsurface characteristics, especially material variability, across a SMU and with depth for each major stratum. In general, geotechnical testing will include moisture content, specific gravity, Atterberg Limits, grain size, and specific gravity. These index properties will also be used in correlations with other geotechnical properties (e.g.

strength parameters, compressibility, permeability) for advanced engineering evaluations including cap-induced settlement and slope stability.

The number of geotechnical tests presented in Table 2 is an estimate and may vary at the time of sampling based on the conditions encountered. In general, the number of sample locations within each SMU was selected to supplement the sampling density from the Phase I PDI and the anticipated remedial action for each SMU. As discussed below, each Vibracore will be sectioned into 1 m intervals unless the stratigraphy warrants a slightly different sample interval to accurately represent the subsurface. For planning purposes it was assumed that each interval would be tested for moisture content. Other index testing would be selected in the field based on a visual characterization of the interval by the field geologist/geotechnical engineer. In general, coarse-grained samples will be submitted for grain size analyses while fine-grained samples would be submitted for both Atterberg Limits and grain size analyses. Based on the observations from the Phase I PDI, it was anticipated that approximately one to two grain size tests and one to two Atterberg Limit tests will be performed for each core selected for geotechnical analyses. Given the limited spatial and vertical variability in specific gravity of solids within a given strata, only a few samples per SMU were assumed.

The geotechnical program for the Phase II PDI also includes collection of a select number of samples for consolidation testing using either the standard oedometer test (ASTM D2435-90) for the seepage-induced consolidation test [SICT] (Liu and Znidarcic, 1991). The SICT is a specialized consolidation test for very soft sediments, through which five dimensionless parameters are determined that describe the consolidation characteristics as a function of void ratio, stress, and permeability. The SICT method provides improved accuracy in prediction of consolidation behavior as compared to a standard (oedometer) consolidation test, especially in the low stress range for very soft sediments. The results of the SICT on the soft sediments will be supplemented with results from standard consolidation tests of stiffer samples collected from the deep borings. The results of both types of consolidation testing will be used to predict the amount of consolidation settlement following placement of an overlying cap. These direct measurements of sediment compressibility will be correlated with the index properties described above, such that the index tests can be used for settlement evaluations where discrete consolidation tests are not conducted.

SMU 1

A total of 97 vibracores will be collected in SMU 1 to a depth of 20 ft (6 m) to identify the extent of the in-lake waste deposit (ILWD) and evaluate the presence of hot spots (Figure 2). Proposed sample locations have been identified in areas where existing deep cores have not been collected during the Phase I PDI (4- and 6-m cores) and the RI (8-m cores). Single cores will be collected at 40 locations and co-located cores will be collected at 21 locations to evaluate the variability of the material. The co-located cores will be no more than 3 ft apart. Clusters of five cores will also be collected at three locations in SMU 1 to evaluate hot spots. Each cluster will include a co-located pair at the center and three single cores approximately 25 ft from the center, as shown on Figure 2. Samples will be collected from these cores on 3.3 ft (1 m) intervals and

analyzed for the chemical and geotechnical parameters listed in Table 2. Additional core locations related to the extent of the ILWD in SMU 2 and SMU 7 are described below.

SMU 2

A total of 17 vibracores will be collected to a 20-ft (6 m) depth in SMU 2 (Figure 3) and analyzed for the chemical and geotechnical parameters listed in Table 2. There are two distinctive sets of proposed samples in this SMU to define the extent of the ILWD along the SMU 1 boundary and to refine dredging and capping areas in the western portion of the SMU. Additional proposed core locations related to the extent of exceedances identified in SMU 2 are presented within the SMU 8 description below.

Nine vibracores, two of which will be co-located at one station, will be collected from the eastern portion of SMU 2 to identify the extent of the ILWD outside of SMU 1 and to evaluate variability of the waste material. Samples will be collected from these cores on 3.3 ft (1 m) intervals and analyzed for the chemical and geotechnical parameters listed in Table 2.

The remaining eight vibracores will be collected from the western portion of SMU 2 in areas where dredging and isolation capping are included in the remedy. Two of these cores will be in the vicinity of the "tarry waste" encountered at Station S435 during the RI. Samples will be collected from these 20 ft (6 m) cores on 3.3 ft (1 m) intervals from the top 13 ft (4 m). The sample intervals below 10 ft will provide additional information on stratigraphy and may be used for geotechnical analysis.

SMU 3

A total of ten vibracores will be collected in SMU 3 to a depth of 20 ft (6 m) in areas where exceedances have been identified. As noted on Figure 4 and in the text below, there are three distinctive sets of proposed samples in this SMU based on the anticipated remedy for those areas.

The three cores adjacent to the shoreline (0 to 10 ft) will be divided into 3.3 ft (1 m) intervals and processed for chemical and geotechnical analyses as specified in Table 2. Results from these cores are intended to define the extent of contamination along the shoreline and to identify the sediment concentrations that will be present if near shore removal is necessary. If near shore removal is necessary, the sediment concentration results from these cores will be used for determining cap placement and for habitat optimization. The two cores in the middle portion (10 to 20 ft) of the SMU will be analyzed for chemical and geotechnical parameters in the top 10 ft (3 m) since exceedances in this area will be isolation capped and deep dredging will likely not be required. The five cores in the 20-30 ft (6-9 m) zone of this SMU will be analyzed for chemical and geotechnical parameters in the 0-0.5 ft and 0.5-3.3 ft intervals for the design of isolation capping and to evaluate the potential for thin layer capping.

As noted above, all cores will be 20 ft (6 m) in length and will be used for geotechnical analysis and defining stratigraphy. Additional proposed core locations related to the extent of exceedances identified in SMU 3 are presented below in the discussion of SMU 8.

SMU 4

A total of 27 vibracores will be collected in SMU 4 to a depth of 20 ft (6 m) in areas where exceedances have been identified. As noted on Figure 5 and in the text below, there are three distinctive sets of proposed samples in this SMU based on the anticipated remedy for those areas.

The nine cores adjacent to the shoreline will be divided into 3.3 ft (1 m) intervals and processed for chemical and geotechnical analyses as specified in Table 2. Results from these cores are intended to define the extent of contamination along the shoreline and to identify the sediment concentrations that will be present if near shore removal is necessary. If near shore removal is necessary, the sediment concentration results from these cores will be used for determining cap placement and for habitat optimization. The nine cores in the middle portion of the SMU will be analyzed for chemical and geotechnical parameters in the top 10 ft (3 m) since exceedances in this area will be isolation capped and deep dredging will likely not be required. The nine cores in the outer portion of this SMU will be analyzed for chemical and geotechnical parameters in the 0-0.5 ft and 0.5-3.3 ft intervals for the design of isolation capping and to evaluate the potential for thin layer capping in the 20-30 ft (6-9 m) zone.

As noted above, all cores will be 20 ft (6 m) in length and will be used for geotechnical analysis and stratigraphy. Additional proposed core locations related to the extent of exceedances identified in SMU 4 are presented below in the discussion of SMU 8.

SMU 5

The proposed samples for SMU 5 are intended to confirm and define the extent of exceedances noted during previous sampling events. Sampling will be focused around the four data points that exceeded either the Mean PECQ (MPECQ) or Mercury PEC during previous sampling events. Additional sampling was conducted in these areas in 2004, but the laboratory data was thought to be biased high (and therefore estimated) due to elevated moisture content reported by the lab in the samples. The elevated moisture content impacts the conversion ratio used to calculate the mercury concentration. Since this would bias the samples toward higher concentrations, only those exceedances noted during the previous sampling event are being resampled in order to confirm these exceedences. A total of 22 shallow vibracores will be collected in four areas of SMU 5 near data points S95, S108, S111 and S66 (Figures 6A-6D). The concentrations noted at locations S95, S108 and S111 exceeded the Mercury PEC of 2.2 mg/kg during previous sampling events. The concentrations noted at the S66 station exceeded the MPECQ of 1 and will require further delineation. All samples will be collected from the 0-0.5 ft interval and analyzed for the chemical and geotechnical parameters listed on Table 2. The chemical results from these samples will be compared to the Mercury PEC and/or the MPECQ to determine if any remediation is required in these areas. Geotechnical data collected from these samples will be used to support remedial design, if necessary.

SMU 6

A total of 17 vibracores will be collected in SMU 6 to a depth of 20 ft (6 m) in areas where exceedances have been identified. As noted on Figure 7 and in the text below, there are three distinctive sets of proposed samples in this SMU based on the anticipated remedy for those areas.

The five cores adjacent to the shoreline will be divided into 3.3 ft (1 m) intervals and processed for chemical and geotechnical analyses as specified in Table 2. Results from these cores are intended to define the extent of contamination along the shoreline and to identify the sediment concentrations that will be present if nearshore removal is necessary. If nearshore removal is necessary, the sediment concentration results from these cores will be used for determining cap placement and for habitat optimization. The seven cores in the middle portion of the SMU will be analyzed for chemical and geotechnical parameters in the top 10 ft (3 m) since exceedances in this area will be isolation capped and deep dredging will likely not be required. The five cores in the outer portion of this SMU will be analyzed for chemical and geotechnical parameters in the 0-0.5 ft and 0.5-3.3 ft intervals for design of the isolation cap and to evaluate the potential for thin layer capping in the 20-30 ft (6-9 m) zone.

As noted above, all cores will be 20 ft (6 m) in length and will be used for geotechnical analysis and stratigraphy. Additional proposed core locations related to the extent of exceedances identified in SMU 6 are presented in SMU 8.

SMU 7

A total of 21 vibracores will be collected to a 20-ft (6 m) depth in SMU 7 (Figure 8) and analyzed for the chemical and geotechnical parameters listed in Table 2. There are two distinctive sets of proposed samples in this SMU to define the extent of the ILWD and refine the lateral and vertical extent of contamination along the shoreline of this SMU.

Eleven vibracores, four of which will be co-located at two stations, will be collected from the western portion of SMU 7 to identify the extent of the ILWD outside of SMU 1 and evaluate variability of the waste material. Samples will be collected from these cores on 3.3 ft (1 m) intervals and analyzed for the chemical and geotechnical parameters listed in Table 2.

The remaining six vibracores will be collected along the shoreline to evaluate the extent of contamination in this area. These results will be used to evaluate the feasibility of targeted dredging or a barrier wall extension along the SMU 7 shoreline. Based on the results of the Phase I cores in this area, samples will be collected from these 20 ft (6 m) cores on 3.3 ft (1 m) intervals from the top 13 ft (4 m). Data collected from the sample intervals below 13 ft will provide additional information on stratigraphy and may be used for geotechnical analysis.

SMU 8

A total of 27 vibracores will be collected at varying depths in SMU 8 to address multiple objectives. Five shallow vibracores will be collected at sample locations in this SMU where MPECQ exceedances have been identified. These locations will be resampled to evaluate the presence or absence of impacted sediment in these areas. These cores will be 0.5 ft deep and analyzed for the chemical and geotechnical parameters noted on Table 2.

Thirteen cores are located near the 30 ft (9 m) mark adjacent to exceedances of the MPECQ or Mercury PEC identified in the littoral zone SMUs. Many of these areas have very few data points in SMU 8 near the littoral/profundal zone boundary and these cores will help define the

extent of the exceedances noted in SMUs 2, 3, 4 and 6. These cores will be 3.3 ft (1 m) deep and will be analyzed from 0-0.5 and 0.5-3.3 ft to determine what type of capping, if any, is required in this area.

The other nine of these cores will be 20 ft (6m) deep and are located near the boundary of SMU 1. Samples will be collected from 0-0.5 ft, 0.5-3.3 ft, and on 3.3 ft intervals to 20 ft to evaluate the extent of the ILWD and determine what type of capping, if any, is required in this area.

6.0 METEOROLOGICAL STATION

In addition to the potential emission rates for the CPOIs, the magnitude of ambient air CPOIs and odor concentrations predicted by dispersion modeling will be a function of the atmospheric conditions governing the transport and diffusion of the emitted compounds. In order to develop the most realistic predictions of concentrations of remediation related emissions, it is necessary to have meteorological data that are most representative of the specific areas under study.

A meteorological station will be installed in the area near SMU 1 to collect site specific data near the dredge zone. The station will be a 10-m meteorological tower similar to the one currently operating at Wastebed 13 and will collect data representative of initial transport of emissions from dredging related activities. The final location of the tower will be determined during a site tour during the Phase II field activities and discussed with NYSDEC prior to installation. To ensure the most precise data are used in the analysis, sensory instrumentation and data acquisition hardware will be used with software that fully meets the performance and operating specifications in USEPA's guidelines for air quality modeling applications, including "Meteorological Monitoring Program Guidance for Regulatory Modeling Applications" (USEPA, 2000).

7.0 DATA MANAGEMENT

Field Database

An electronic database will be developed for the Phase II PDI to ensure consistency in field sample ID assignment and compatibility with the Locus Focus data management system. The data collection program prepared for the Phase II field program will be similar to the one used during the Phase I PDI.

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 at a frequency of one per twenty samples for each sample media (sediment and porewater). 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 QAPP.

Sample Holding

Samples will be collected and handled according to the procedures outlined in the Phase I PDI SAP and QAPP.

Sample Collection and Recordkeeping

Samples will be collected and 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 SAP and QAPP on each of the sampling vessels and in the sample processing area.

Data Validation

Analytical data generated during the investigation activities will be reviewed and validated in accordance with the approved Phase I SAP and QAPP. Data validation of Level II through Level IV analytical deliverables will be performed (task dependent) in accordance with guidance provided by the USEPA and adapted to the QA/QC criteria in the USEPA CLP, USEPA SW-846. Following validation, the results will be incorporated into the Locus Focus database.

8.0 DATA REPORTING

The Phase II PDI includes multiple sample locations and analyses for chemical and geotechnical evaluations. Upon completion of the Phase II PDI field activities and laboratory analyses, Parsons will submit unvalidated and validated electronic data to NYSDEC 30 and 60 days, respectively, following receipt of analytical data, QA/QC information, or special analyses from the laboratories or other subcontractors. Once the Phase II investigation and evaluation has been completed, a summary report will be prepared and submitted to NYSDEC.

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TABLE 1

Onondaga Lake Phase II PDI
Task Summary

Task	Objective	Location	Primary Activity
Sediment Coring	Refine dredge volumes and cap areas	SMUs 1-8	Shallow (up to 20 ft) vibracore sediment samples analyzed for chemical and geotechnical properties.
	Volumes needed for SCA design		
	Evaluate the extent of the ILWD in SMU 2, 7, and 8		
Deep Borings	Calibrate/evaluate assumptions in groundwater model	SMUs 1 & 3	Deep borings for stratigraphy, and sediment/porewater samples analyzed for chemical and geotechnical properties.
	Identify stratigraphy and quantify upwelling velocities		
Lake Meterological Station	Collect meteorological data to support the design, primarily odor & emissions modeling	Lakeshore near SMU 1	Install met tower, instrumentation, and controls and monitor for a one year period.

TABLE 2
Onondaga Lake Phase II PDI
Sample Locations and Analysis

							Chemical																				Geotechnical					
							Sediment												Dissolved Porewater from Centrifuge		Dissolved Porewater				Index				Consolidation	
Description		Map Symbol	Number of Locations	Number of Intervals	Sampling Intervals (ft)	Location	Total Depth (ft)	Mercury	VOCs (CPOIs) + Benzene & Toluene	SVOCs (CPOIs) + Phenol	Total PCBs	pH	Total Sulfides	Total Ammonia	TOC (Loyd Kahn)	Phenol		TCL VOCs	Bulk Density	Cations/Anions	Salinity - Method SW 9050	Cations/Anions	TCL VOCs	Salinity - Method SW 9050	Isotopic Analysis, Hydrometer Reading	Cations/Anions	Moisture Content	Grain Size w/Hydrometer	Atterberg Limits	Specific Gravity	Seepage Induced Consolidation Test	Std Consolidation (Undisturbed)
							Number of Samples																									
SMU 1	Deep Boring to Till/Top of Rock		1	TBD	Split Spoons / Shelby Tubes	OL-STA-10061	~150 ft										Marl		1	1	1	1					30	10	10	3	1	2
																	Clay	3	3	3	3	3									
																	Fine Sand	4	4	4	if needed	if needed	4	4		4					
																	Sand/ Gravel	2	2	2	if needed	if needed	2	2	1	2					
																	Bedrock						1	1	1	1					
	Shallow Vibracores		51	6	3.3 ft (1m) intervals from top 20 ft of core	OL-VC-10034 - 10107	20	582	582	582	582	582	582	582	582													180	43	43	8	6	
	Co-located Vibracores (Suffix of "A")		46	6																												
SMU 2	Shallow Vibracores		8	4	3.3 ft (1m) intervals from top 13 ft of core	OL-VC-20067 - 20071, 20080 - 20082	20	32	32	32	32	32	32	32	32													30	15	8	5	1	
	Shallow Vibracores		7	6	3.3 ft (1m) intervals from top 20 ft of core	OL-VC-20072 -20079/A	20	54	54	54	54	54	54	54	54													48	24	16	8	2	
	Co-located Vibracores (Suffix of "A")		2	6																												

TABLE 2
Onondaga Lake Phase II PDI
Sample Locations and Analysis

								Chemical																				Geotechnical					
								Sediment											Dissolved Porewater from Centrifuge		Dissolved Porewater					Index				Consolidation	
Description		Map Symbol	Number of Locations	Number of Intervals	Sampling Intervals (ft)	Location	Total Depth (ft)	Mercury	VOCs (CPOIs) + Benzene & Toluene	SVOCs (CPOIs) + Phenol	Total PCBs	pH	Total Sulfides	Total Ammonia	TOC (Loyd Kahn)	Phenol		TCL VOCs	Bulk Density	Cations/Anions	Salinity - Method SW 9050	Cations/Anions	TCL VOCs	Salinity - Method SW 9050	Isotopic Analysis, Hydrometer Reading	Cations/Anions	Moisture Content	Grain Size w/Hydrometer	Atterberg Limits	Specific Gravity	Seepage Induced Consolidation Test	Std Consolidation (Undisturbed)
SMU 3	Deep Boring to Till/Top of Rock		1	TBD	Split Spoons / Shelby Tubes	OL-STA-30033	~150 ft										Marl		1	1	1	1										
																	Clay	3	3	3	3	3									
																	Fine Sand	4	4	4	if needed	if needed	4	4		4	30	8	8	3	1	2
																	Sand/ Gravel	2	2	2	if needed	if needed	2	2	1	2						
																	Bedrock						1	1	1	1						
	Shallow Vibracores		5	2	0-0.5 and 0.5-3.3 ft intervals	OL-VC-30034 - 30038	20	10	10	10	10	10	10	10	10													35	15	10	5	2	
			2	3	3.3 ft (1m) intervals from top 10 ft of core	OL-VC-30039 - 30040	20	6	6	6	6	6	6	6	6													12	4	4	1	1	
			3	6	3.3 ft (1m) intervals from top 20 ft of core	OL-VC-30041 - 30043	20	18	18	18	18	18	18	18	18													18	6	6	2	1	
SMU 4	Shallow Vibracores		9	2	0-0.5 and 0.5-3.3 ft intervals	OL-VC-40016 - 40024	20	18	18			18	18	18	18	18													63	18	16	3	2	
			9	3	3.3 ft (1m) intervals from top 10 ft of core	OL-VC-40025 - 40032, 40042	20	27	27			27	27	27	27	27													48	16	16	2	2	
			9	6	3.3 ft (1m) intervals from top 20 ft of core	OL-VC-40033 - 40041	20	54	54			54	54	54	54	54													54	18	16	2	1	

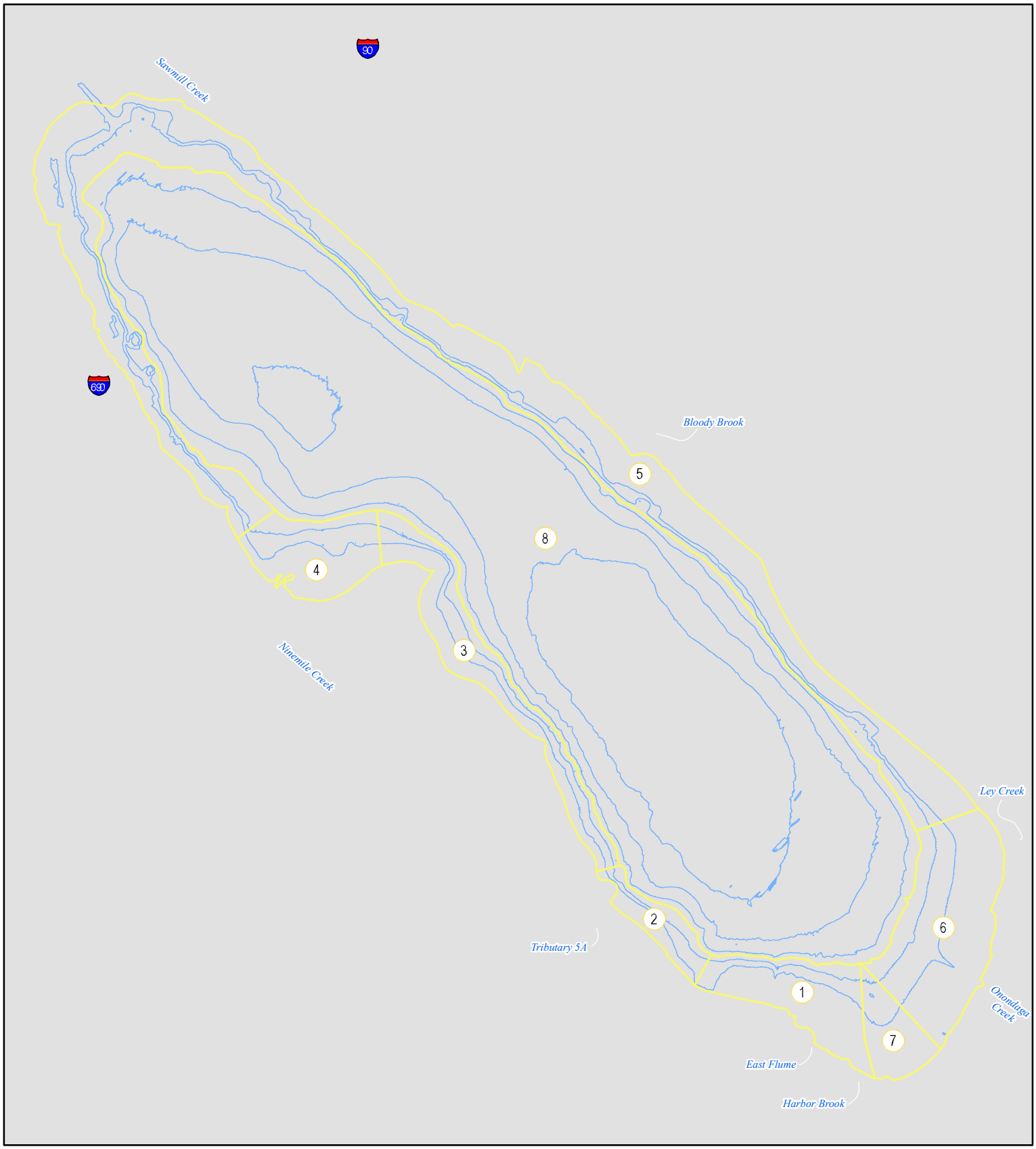
TABLE 2
Onondaga Lake Phase II PDI
Sample Locations and Analysis

								Chemical																								Geotechnical					
								Sediment														Dissolved Porewater from Centrifuge		Dissolved Porewater				Index				Consolidation	
Description		Map Symbol	Number of Locations	Number of Intervals	Sampling Intervals (ft)	Location	Total Depth (ft)	Mercury	VOCs (CPOIs) + Benzene & Toluene	SVOCs (CPOIs) + Phenol	Total PCBs	pH	Total Sulfides	Total Ammonia	TOC (Loyd Kahn)	Phenol		TCL VOCs	Bulk Density	Cations/Anions	Salinity - Method SW 9050	Cations/Anions	TCL VOCs	Salinity - Method SW 9050	Isotopic Analysis, Hydrometer Reading	Cations/Anions	Moisture Content	Grain Size w/Hydrometer	Atterberg Limits	Specific Gravity	Seepage Induced Consolidation Test	Std Consolidation (Undisturbed)
SMU 5	Surface Vibracores		17	1	0 - 0.5 ft interval	OL-VC-50001 - 50017 (S95, S108, S111)	0.5	17							17													17	3	3	1		
			5	1	0 - 0.5 ft interval	OL-VC-50018-50022 (S66)	0.5	5	5	5	5	5	5	5	5													5	2	2	1		
SMU 6	Shallow Vibracores		5	2	0-0.5 and 0.5-3.3 ft intervals	OL-VC-60054 - 60058	20	10	10	10	10	10	10	10	10													35	15	10	3	2	
			7	3	3.3 ft (1m) intervals from top 10 ft of core	OL-VC-60059 - 60065	20	21	21	21	21	21	21	21	21													42	14	14	3	2	
			5	6	3.3 ft (1m) intervals from top 20 ft of core	OL-VC-60066 - 60070	20	30	30	30	30	30	30	30	30													30	15	10	3		

TABLE 2
Onondaga Lake Phase II PDI
Sample Locations and Analysis

								Chemical																						Geotechnical					
								Sediment													Dissolved Porewater from Centrifuge		Dissolved Porewater				Index				Consolidation	
Description		Map Symbol	Number of Locations	Number of Intervals	Sampling Intervals (ft)	Location	Total Depth (ft)	Mercury	VOCs (CPOIs) + Benzene & Toluene	SVOCs (CPOIs) + Phenol	Total PCBs	pH	Total Sulfides	Total Ammonia	TOC (Loyd Kahn)	Phenol		TCL VOCs	Bulk Density	Cations/Anions	Salinity - Method SW 9050	Cations/Anions	TCL VOCs	Salinity - Method SW 9050	Isotopic Analysis, Hydrometer Reading	Cations/Anions	Moisture Content	Grain Size w/Hydrometer	Atterberg Limits	Specific Gravity	Seepage Induced Consolidation Test	Std Consolidation (Undisturbed)
SMU 7	Shallow Vibracores		11	6	3.3 ft (1m) intervals from top 20 ft of core	OL-VC-70016 - 70024 and OL-VC-70031 - 70034	20	90	90	90	90	90	90	90	90													54	16	16	3	2	
	Co-located Vibracores (Suffix of A/B)		4	6																														
	Shallow Vibracores		6	4	3.3 ft intervals from top 13 ft of core	OL-VC-70025 - 70030	20	24	24	24	24	24	24	24	24													36	18	12	2		
SMU 8	Surface Vibracores		5	1	0 - 0.5 ft interval	OL-VC-80023 - 80027	0.5	5	5	5	5	5	5	5	5													5	3	3	2		
	Shallow Vibracores		9	7	0-0.5, 0.5-3.3 and 3.3 ft (1m) intervals from top 20 ft of core	OL-VC-80028 - 80036	20	63	63	63	63	63	63	63	63													63	10	10	3	3	
			10	2	0-0.5 and 0.5-3.3 ft intervals	OL-VC-80037 - 80045, 80049	3.3	20	20	20	20	20	20	20	20													18	9	9	2	2	
			3	2	0-0.5 and 0.5-3.3 ft intervals	OL-VC-80046 - 80048	3.3	6				6	6	6	6	6												6	3	3	1	1	

Note: CPOI list for VOCs and SVOCs are the same compounds as the Phase I PDI (Parsons, 2005)



1 SMU 1 - In-lake Waste Deposit (ILWD)
2 SMU 2 - Causeway
3 SMU 3 - Wastebeds 1 through 8
4 SMU 4 - Mouth of Ninemile Creek
5 SMU 5 - Northern Shore
6 SMU 6 - Ley Creek to 700 feet south of Onondaga Creek
7 SMU 7 - 700 feet south of Onondaga Creek to the ILWD
8 SMU 8 - Profundal Area

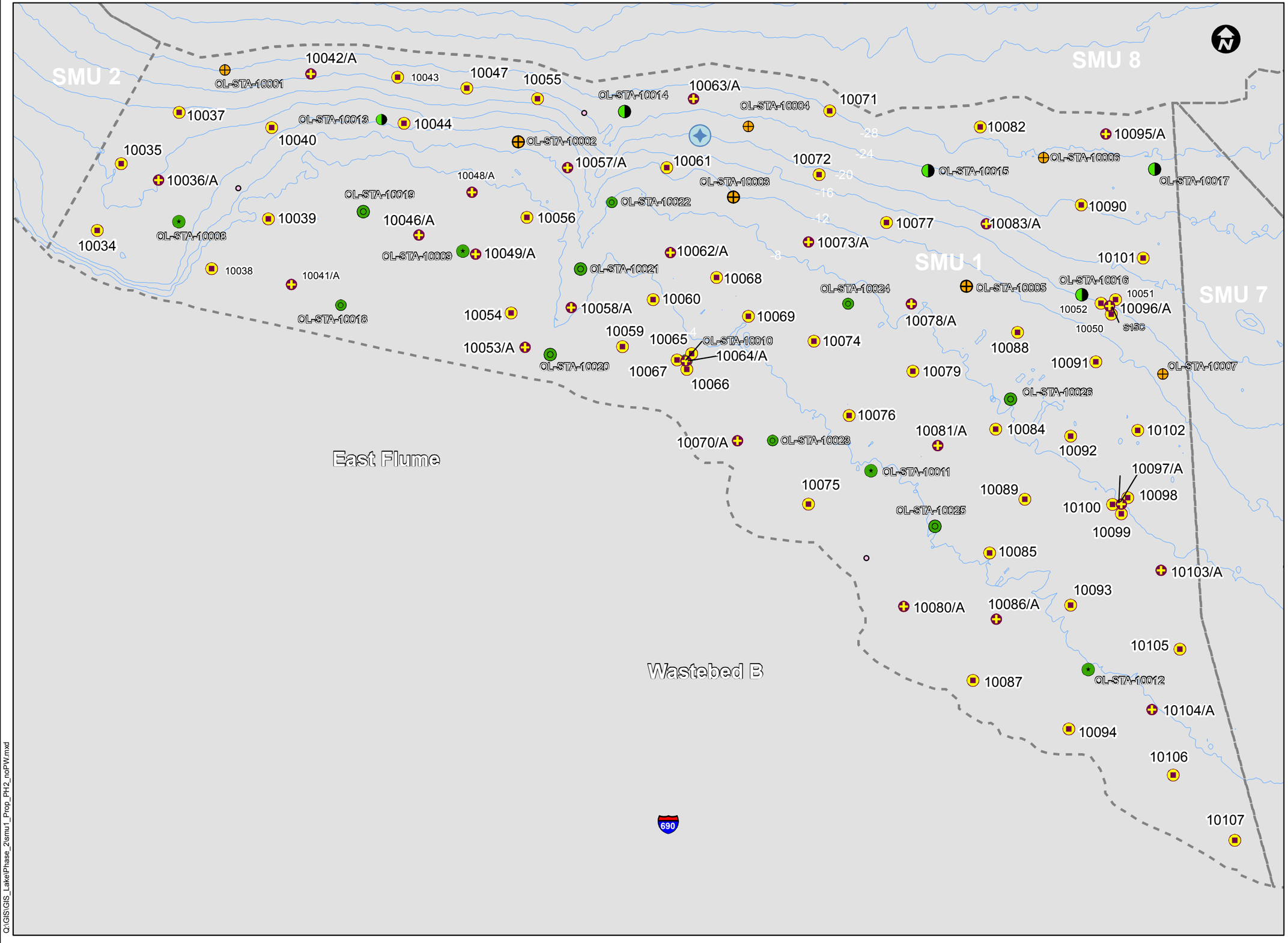
1. The 30ft bathymetric contour coincides with the SMU 8 boundary.

2. Contour interval = 12 feet

3. Water depth based on average lake elevation of 362.82 feet.

1,700 850 0 1,700
Feet

Onondaga Lake
Syracuse, New York



Proposed Deep Boring to Till / Top of Bedrock

Phase II PDI Sample Locations

- 20 Ft (6 m) Core (Sample on 3.3 Ft intervals to 20 Ft)
- 20 Ft (6 m) Colocated Core (Sample on 3.3 Ft intervals to 20 Ft)

Phase I PDI Sample Locations

- 13 Ft (4 m) Core
- 20 Ft (6 m) Core
- 72 Ft (22 m) Boring, CPT and 13 Ft (4 m) Core
- 72 Ft (22 m) Boring, CPT and 20 Ft (6 m) Core

RI/FS Locations

- 0 - 6.6 Ft (0 - 2 m)
- 20 - 26 Ft (6 - 8 m)

NOTES

1. Bathymetry contours are in 4 foot intervals.
2. Water depth based on average lake elevation of 362.82 feet.
3. Colocated cores will be less than 1 meter apart.
4. Clustered cores will be 25 feet from center core.

0 55 110 220 330 440 550
Feet

FIGURE 2

Honeywell
Onondaga Lake
Syracuse, New York

SMU 1
Proposed Phase II PDI Sample Locations

PARSONS
290 ELWOOD DAVIS RD, SUITE 312, LIVERPOOL, NY 13088 Phone:(315)451-9560

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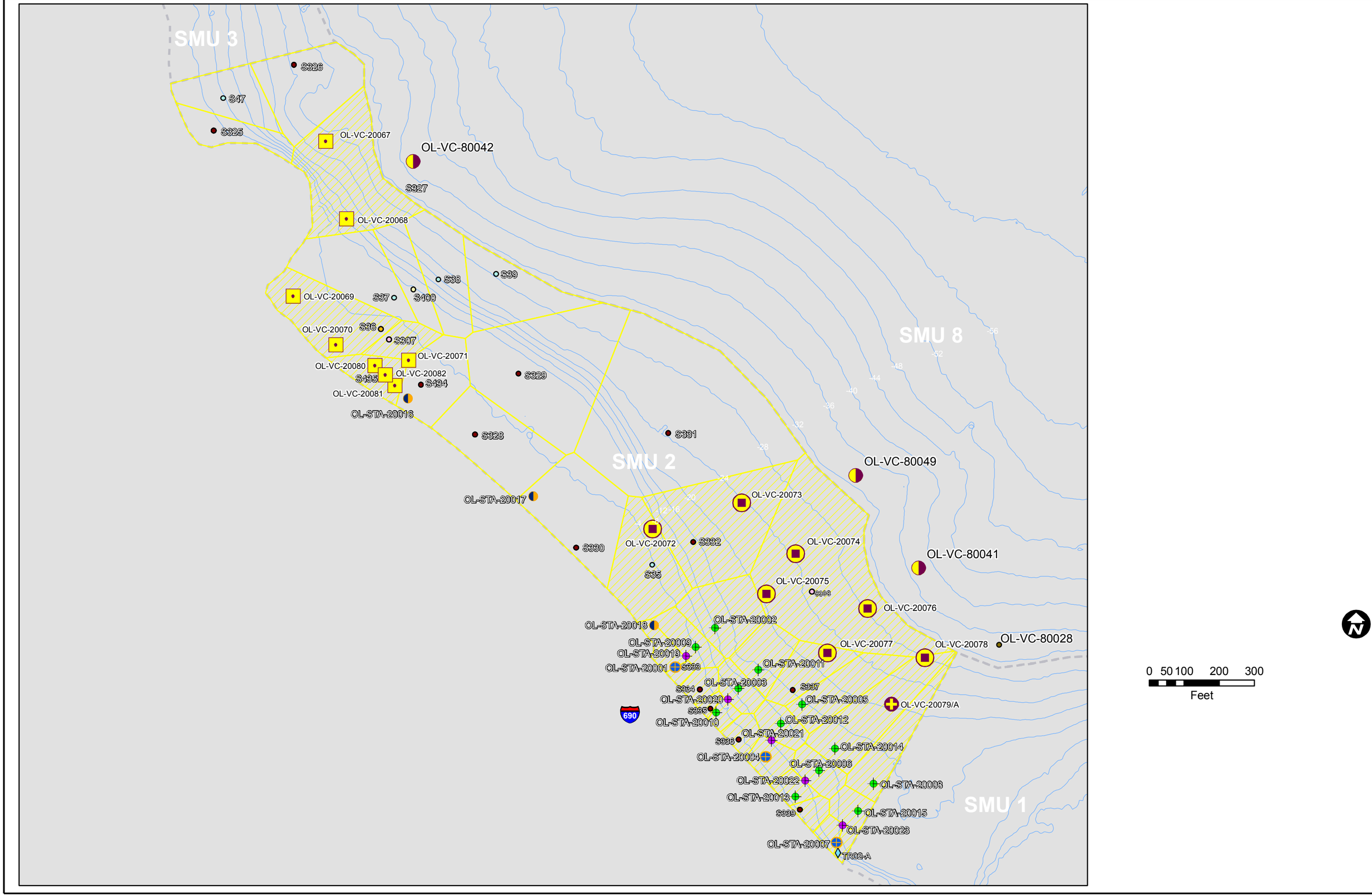
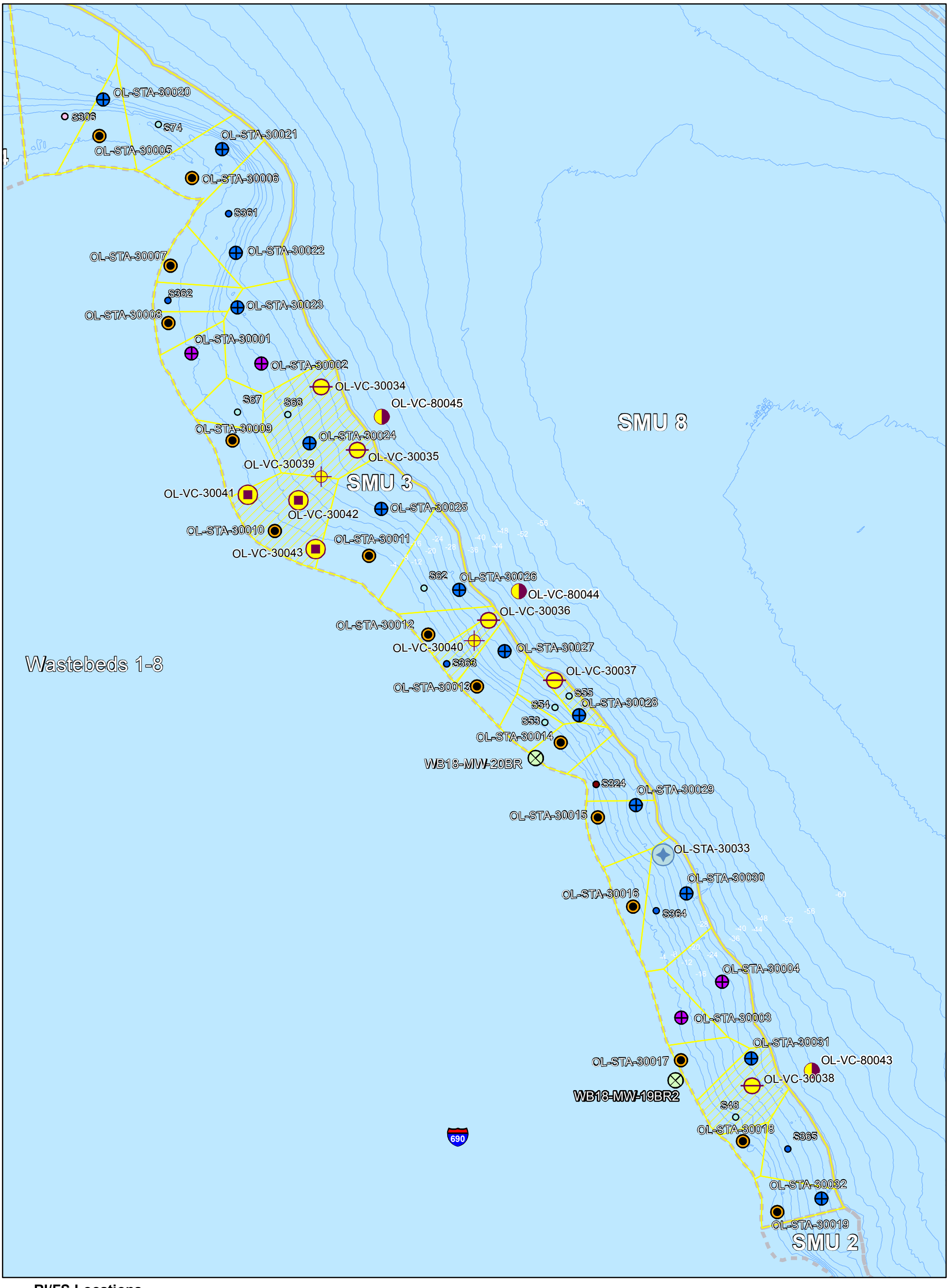

SMU 3
S326
S47
S325
OL-VC-20067
OL-VC-80042
S327
OL-VC-20068
S33
S39
OL-VC-20069
S37
S400
OL-VC-20070
S36
S307
OL-VC-20071
OL-VC-20080
OL-VC-20082
S435
S434
OL-VC-20081
OL-STA-20016
S329
SMU 8
S328
S331
SMU 2
OL-VC-80049
OL-STA-20017
OL-VC-20073
OL-VC-20072
S332
OL-VC-20074
OL-VC-80041
S330
S35
OL-VC-20075
S308
OL-VC-20076
OL-STA-20018
OL-STA-20002
OL-STA-20009
OL-STA-20019
OL-VC-20077
OL-VC-20078
OL-VC-80028
OL-STA-20001
S333
OL-STA-20011
OL-STA-20003
S334
S337
OL-STA-20020
OL-STA-20005
OL-VC-20079/A
S335
690
OL-STA-20010
OL-STA-20012
OL-STA-20021
S336
OL-STA-20014
OL-STA-20004
OL-STA-20006
OL-STA-20022
OL-STA-20003
OL-STA-20013
S339
SMU 1
OL-STA-20015
OL-STA-20023
OL-STA-20007
TR02-A
0 50 100 200 300
Feet



RI/FS Locations

- Bedrock Well
- Monitoring Well
- 0.07 - 0.16 Ft (0 - 5 cm)
- 0.17 - 0.50 Ft (5 - 15 cm)
- 0.5 - 1.0 Ft (15 - 30 cm)
- 1.0 - 3.3 Ft (30 - 100 cm)
- 3.3 - 7.0 Ft (1 - 2 m)
- 7 - 13 Ft (2 - 4 m)
- 13 - 17 Ft (4 - 5 m)
- 17 - 26 Ft (5 - 8 m)

Phase I PDI Sample Locations

- 33 Ft (10 m) Boring, 13 Ft (4 m) Core, Surface Water Sample
- 13 Ft (4 m) Core and Surface Water Sample
- Vane Shear/Atterberg Limits and Surface Water Sample

Proposed Phase II PDI Sample Locations

- Deep Boring to Till/Top of Bedrock
- 20 Ft (6 m) Core (Sample 0-0.5 Ft and 0.5-3.3 Ft)
- 20 Ft (6 m) Core (Sample on 3.3 Ft intervals to 10 Ft)
- 20 Ft (6 m) Core (Sample on 3.3 Ft intervals to 20 Ft)
- 3.3 Ft (1 m) Core (Sample 0-0.5 Ft and 0.5-3.3 Ft)
- Mean PECQ > 1 and/or Mercury > 2.2 mg/kg within the top 1 meter

0 150 300 600 900 1,200 1,500 Feet

NOTES

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

FIGURE 4

Honeywell

Onondaga Lake
Syracuse, New York

SMU 3
Proposed Phase II PDI Sampling Locations

PARSONS
290 ELWOOD DAVIS RD, SUITE 312, LIVERPOOL, NY 13088 PHONE:(315)451-9560

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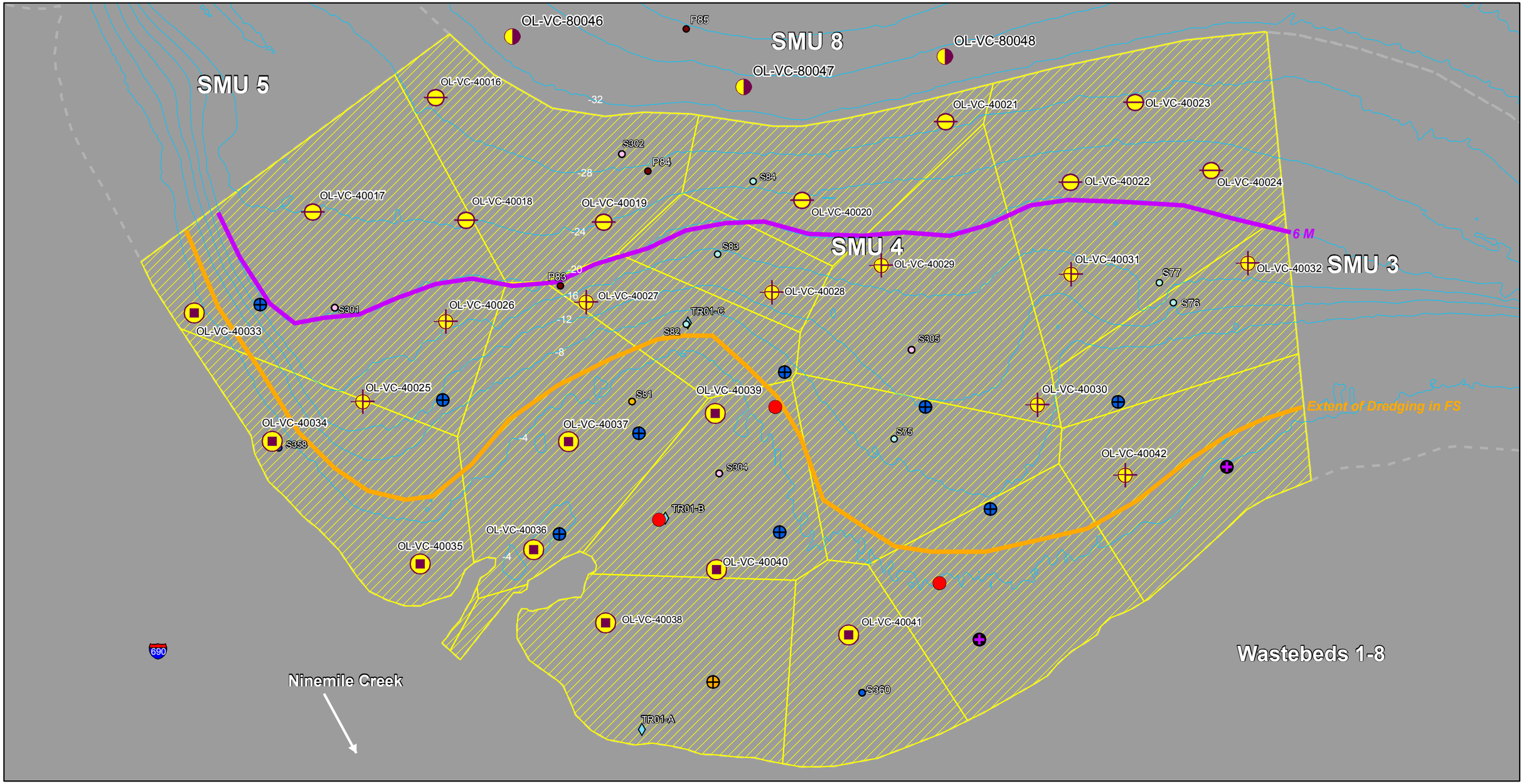

RI/FS Existing Locations

- 0.07 - 0.16 Ft (0 - 5 cm)
- 0.17 - 0.50 Ft (5 - 15 cm)
- 0.5 - 1.0 Ft (15 - 30 cm)
- 1.0 - 3.3 Ft (30 - 100 cm)
- 3.3 - 7.0 Ft (1 - 2 m)
- 7 - 13 Ft (2 - 4 m)
- 13 - 17 Ft (4 - 5 m)
- 17 - 26 Ft (5 - 8 m)

PDI Phase I Sample Locations

- 13 Ft (4 m) Core and Vane Shear/ Atterberg Limits
- 33 Ft (10 m) Boring, 13 Ft (4 m) Core, Vane Shear/ Atterberg Limits and Porewater Samples (Groundwater Model)
- Vane Shear/ Atterberg Limits (No chemical analysis)
- Seepage Meter (No chemical analysis)
- Upwelling Sample Station

Proposed Phase II PDI Sample Locations

- 20 Ft (6 m) Core (Sample 0-0.5 Ft and 0.5-3.3 Ft)
- 20 Ft (6 m) Core (Sample on 3.3 Ft intervals to 10 Ft)
- 20 Ft (6 m) Core (Sample on 3.3 Ft intervals to 20 Ft)
- 3.3 Ft (1 m) Core (Sample 0-0.5 Ft and 0.5-3.3 Ft)

Mean PECQ > 1 and/or Mercury > 2.2 mg/kg within the top 1 meter

N

NOTES

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

0 55 110 220 330 440 550

Feet

FIGURE 5

Honeywell

Onondaga Lake
Syracuse, New York

SMU 4
Proposed Phase II PDI Sampling Locations

PARSONS
290 ELWOOD DAVIS RD, SUITE 312, LIVERPOOL, NY 13088 Phone:(315)451-9560

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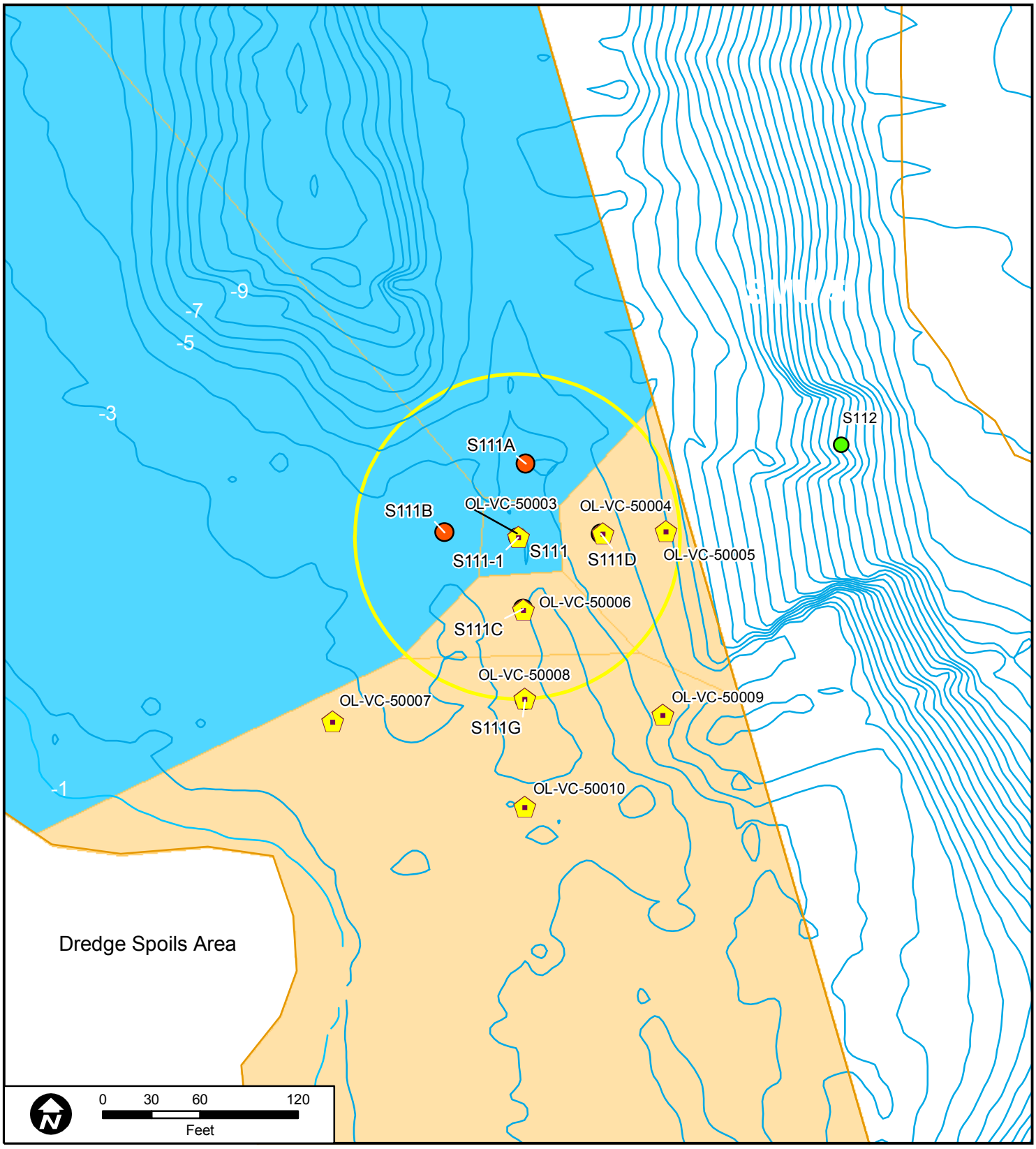
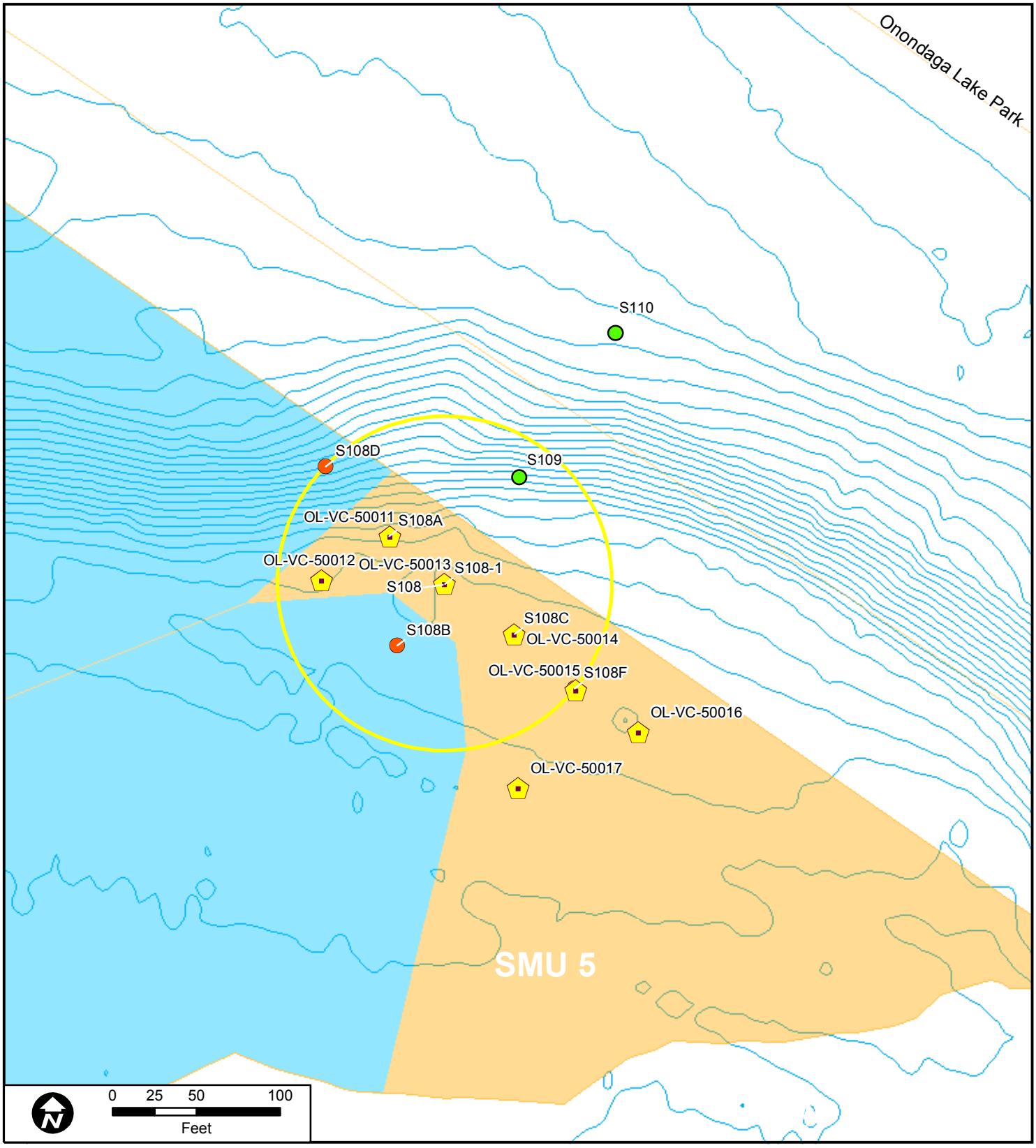


FIGURE 6.A

ONONDAGA LAKE,
SYRACUSE, NEW YORK

SMU 5 - S111
Proposed Phase II PDI Sample Locations

PARSONS
290 ELWOOD DAVIS RD., SUITE 312, LIVERPOOL, NY 13088 PHONE: (315) 451-9560



Proposed
Phase II PDI Sample Locations

0.5 Ft Core

NOTES
1. Bathymetric contours are at 1-foot intervals.

2. Orthophotos courtesy of NYSGIS Clearinghouse (2002)

FIGURE 6.B

Honeywell

ONONDAGA LAKE,
SYRACUSE, NEW YORK

SMU 5 - S108
Proposed Phase II PDI Sample Locations

PARSONS
290 ELWOOD DAVIS RD., SUITE 312, LIVERPOOL, NY 13088 PHONE: (315) 451-9560

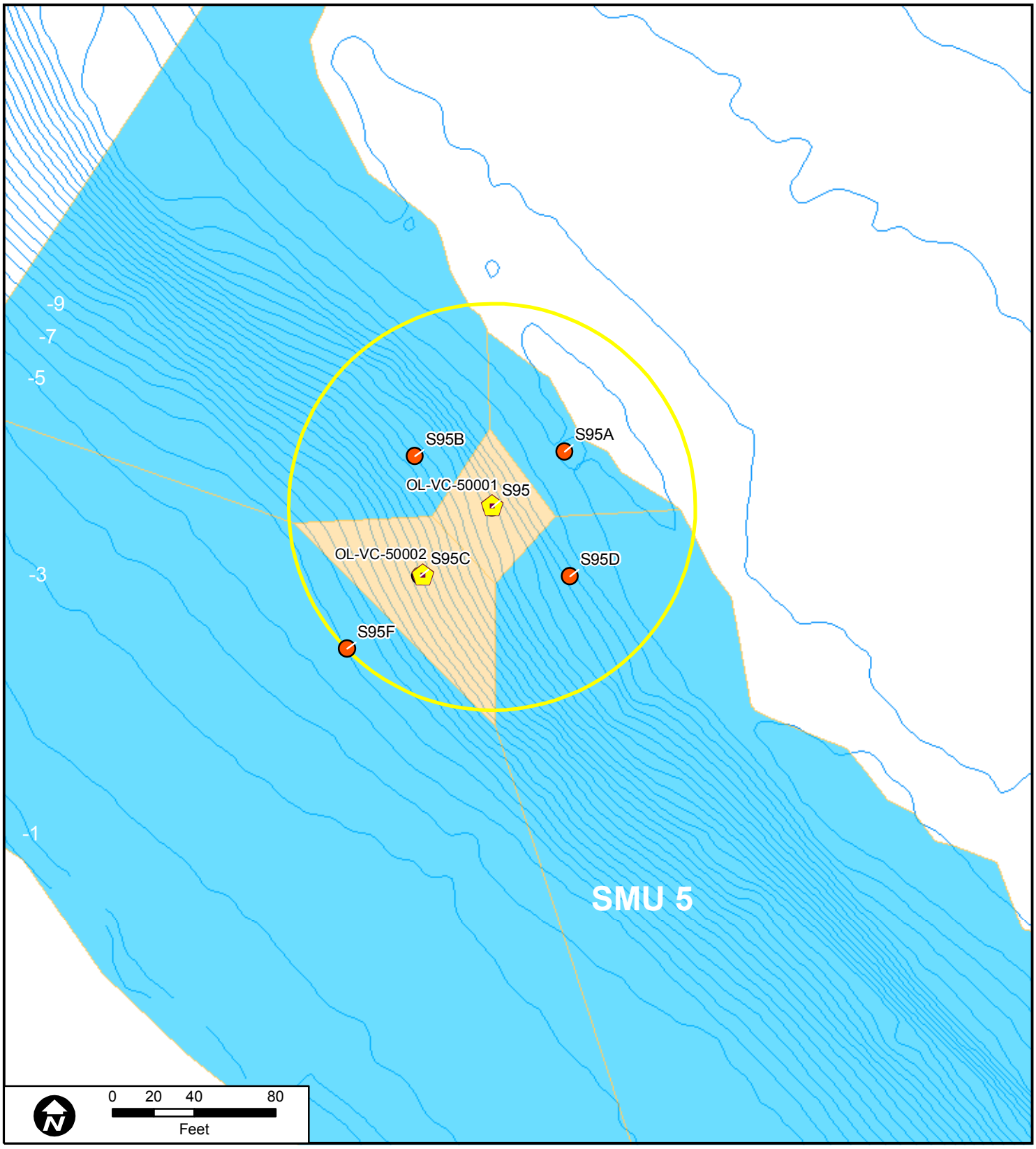


FIGURE 6.C

ONONDAGA LAKE,
SYRACUSE, NEW YORK

SMU 5 - S95
Proposed Phase II PDI Sample Locations

PARSONS
290 ELWOOD DAVIS RD., SUITE 312, LIVERPOOL, NY 13088 PHONE: (315) 451-9560

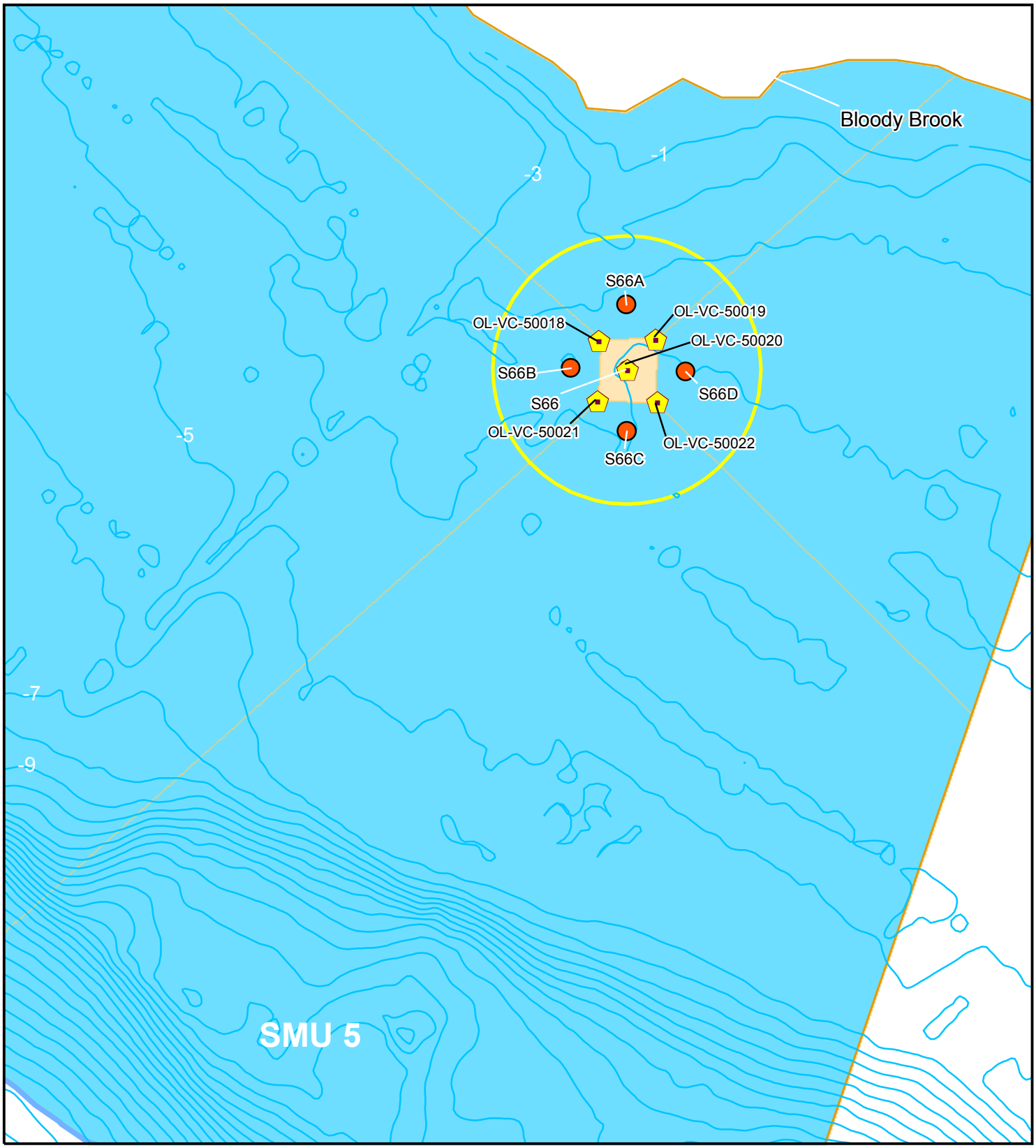
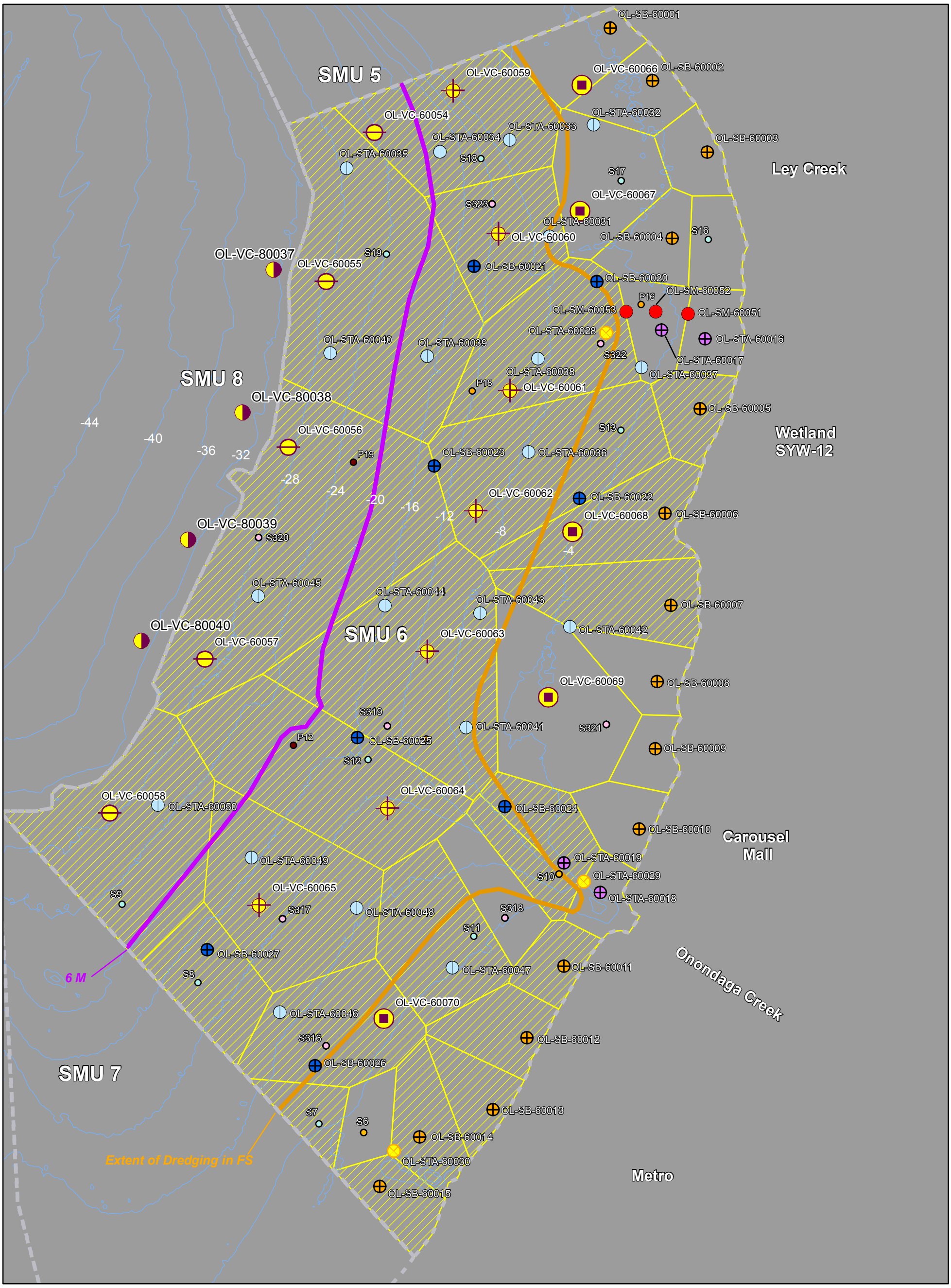


FIGURE 6.D

SMU 5 - S66
Proposed Phase II PDI Sample Locations

PARSONS
290 ELWOOD DAVIS RD., SUITE 312, LIVERPOOL, NY 13088 PHONE: (315) 451-9560



RI/FS Locations

- 0.07 - 0.16 Ft (0 - 5 cm)
- 0.17 - 0.50 Ft (5 - 15 cm)
- 0.5 - 1.0 Ft (15 - 30 cm)
- 1.0 - 3.3 Ft (30 - 100 cm)
- 3.3 - 7.0 Ft (1 - 2 m)
- 7 - 13 Ft (2 - 4 m)
- 13 - 17 Ft (4 - 5 m)
- 17 - 26 Ft (5 - 8 m)

Phase I PDI Sample Locations

- 13 Ft (4 m) Core
- 33 Ft (10 m) Boring, 13 Ft (4 m) Core, and Porewater Samples (Groundwater Model)
- Vane Shear/Atterberg Limits
- Bulk Sediment and Water Sample for Emissions, Column Settling and Effluent Ellutriate Testing (3 Locations, 1 Composite)
- Porewater Sample (Cap Model)
- Seepage Meter

Proposed Phase II PDI Sample Locations

- 20 Ft (6 m) Core (Sample 0-0.5 Ft and 0.5-3.3 Ft)
- 20 Ft (6 m) Core (Sample on 3.3 Ft intervals to 10 Ft)
- 20 Ft (6 m) Core (Sample on 3.3 Ft intervals to 20 Ft)
- 3.3 Ft (1 m) Core (Sample 0-0.5 Ft and 0.5-3.3 Ft

0 105 210 420 630 840
Feet

NOTES

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

Mean PECQ > 1 and/or Mercury > 2.2 mg/kg within the top 1 meter.

FIGURE 7

Honeywell

Onondaga Lake
Syracuse, New York

SMU 6
Proposed Phase II PDI Sampling Locations

PARSONS
290 ELWOOD DAVIS RD, SUITE 312, LIVERPOOL, NY 13088 Phone:(315)451-9560

SMU 8

SMU 6

SMU 7

SMU 1

Harbor Brook

-28
-24
-20
-16
-12
-8
-4

OL-VC-70016
S315
OL-VC-70017
OL-VC-70031
P9
OL-VC-70018
OL-SB-70009
S22
OL-VC-70019
P8
S407
OL-VC-70034
OL-VC-70032
OL-VC-70033
P4
OL-VC-70021/A
OL-VC-70022
OL-SB-70011
OL-VC-70020
S4
TR05-D
OL-SB-70010
TR06-C
TR05-C
OL-SB-70014
S5
OL-SB-70008
OL-VC-70023
P3
OL-VC-70024/A
OL-VC-70030
S3
S2
TR06-B
OL-STA-70008-VC
OL-SB-70013
OL-SB-70007
OL-SB-70012
OL-STA-70007-VC
OL-SB-70004
S314
OL-SB-70015
OL-SB-70006
S353
OL-VC-70029
OL-SB-70005
OL-SB-70002
OL-SB-70003
S1
OL-STA-70006-VC
OL-VC-70026
OL-VC-70028
OL-VC-70025
S313
OL-VC-70027
OL-SB-70001
S351
S352
TR06-A
OL-STA-70005-VC

RI/FS Locations

- 0.07 - 0.16 Ft (0 - 5 cm)
- 0.17 - 0.50 Ft (5 - 15 cm)
- 0.5 - 1.0 Ft (15 - 30 cm)
- 1.0 - 3.3 Ft (30 - 100 cm)
- 3.3 - 7.0 Ft (1 - 2 m)
- 7 - 13 Ft (2 - 4 m)
- 13 - 17 Ft (4- 5 m)
- 17 - 26 Ft (5 - 8 m)
- Upwelling Sample Station

Phase I PDI Sample Locations

- 20 Ft (6 m) Core
- 33 Ft (10 m) Boring, 20 Ft (6 m) Core, and Porewater Samples (Groundwater Model)
- Vane Shear/Atterberg Limits
- Bulk Sediment Sample for Emissions Testing and Odor

NOTES

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

Proposed Phase II PDI Sample Locations

- 20 Ft (6 m) Core (Sample on 3.3 Ft intervals to 13 Ft)
- 20 Ft (6 m) Core (Sample on 3.3 Ft intervals to 20 Ft)
- 20 Ft (6 m) Co-located Core (Sample on 3.3 Ft intervals to 20 Ft)
- Mean PECQ > 1 and/or Mercury > 2.2 mg/kg within the top 1 meter

0 40 80 160 240 320 400
Feet

FIGURE 8

Honeywell
Onondaga Lake
Syracuse, New York

SMU 7
Phase II PDI Sampling Locations

PARSONS
290 ELWOOD DAVIS RD, SUITE 312, LIVERPOOL, NY 13088 Phone:(315)451-9560

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Sawmill Creek

SMU 5

P107
S107

S106

OL-SS-80001
S103

P99
S99

P98
S98

S102

S91
P91

OL-SS-80002

P97
S97

OL-VC-80023

S90

P80

P96
S96

S80

OL-SS-80003

P89
S89

S86

S88
P88

SMU 8

P79
S79

S303

P78
S78

OL-SS-80005

OL-SS-80004

OL-VC-80048

S85

OL-SS-80006

P69
S69

OL-VC-80046

OL-VC-80047

SMU 4

S63
P63

OL-VC-80045

SMU 3

Wastebeds 1-8

Ninemile Creek

OL-VC-80044

60
40
50
30
20
10

RI/FS Locations

- 0.07 - 0.16 Ft. (0-5 cm)
- 0.17 - 0.50 Ft. (5.2 - 15 cm)
- 0.5 - 1.0 Ft. (15 - 30 cm)
- 1.0 - 3.3 Ft. (10 - 100 cm)
- 3.3 - 7.0 Ft. (1 - 2 m)
- 7 - 13 Ft. (2 - 4 m)
- 13 - 17 Ft. (4 - 5 m)
- 17 - 26 Ft. (5 - 8 m)

Phase I PDI Sample Locations

- 0.05 Ft (0.02 m) Surficial Sediment Grab (For MNR)

Proposed Phase II PDI Sample Locations

- 3.3 Ft (1 m) Core (Sample 0-0.5 Ft and 0.5-3.3 Ft)
- 0.5 Ft Core

Mean PECQ > 1 within the top 1 meter

NOTES

1. Bathymetry contour interval = 10 feet
2. Water depth based on average lake elevation of 362.82 feet.

0 300 600 1,200 1,800 2,400 3,000

Feet

FIGURE 9.A

Honeywell

Onondaga Lake
Syracuse, New York

SMU 8
Proposed Phase II PDI Sample Locations

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290 ELWOOD DAVIS RD, SUITE 312, LIVERPOOL, NY 13088 Phone:(315)451-9560

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SMU 8
SMU 5
SMU 3
SMU 2
S70
P70
P69
OL-SS-80006
S69
P65
S65
P64
S64
OL-SS-80007
S60
P59
S59
P63
OL-VC-80045
S63
P58
OL-SS-80008
S58
OL-VC-80044
OL-VC-80024
S56
P57
OL-VC-80025
OL-SS-80009
S57
P52
S52
S51
S44
P50
S50
P49
S49
OL-SS-80010
P43
S43
OL-SS-80011
S33
OL-SS-80012
OL-VC-80043
P42
S42
P32
S32
OL-SS-80013
OL-VC-80037
OL-SS-80014
S41
P41
S40
OL-VC-80042
OL-SS-80015
P31
S31
OL-VC-80026
OL-VC-80038
S27
S355
OL-SS-80016
OL-SS-80017
P25
S25
OL-VC-80039
OL-VC-80033
OL-SS-80018
S30
S354
P30
OL-SS-80019
OL-VC-80041
OL-VC-80034
OL-VC-80035
OL-VC-80036
OL-VC-80040
OL-SS-80027
S24
OL-SS-80020
OL-VC-80028
OL-VC-80029
OL-VC-80030
OL-VC-80031
OL-VC-80032
690
Tributary 5A

RI/FS Locations

- 0.07 - 0.16 Ft. (0-5 cm)
- 0.17 - 0.50 Ft. (5.2 - 15 cm)
- 0.5 - 1.0 Ft. (15 - 30 cm)
- 1.0 - 3.3 Ft. (10 - 100 cm)
- 3.3 - 7.0 Ft. (1 - 2 m)
- 7 - 13 Ft. (2 - 4 m)
- 13 - 17 Ft. (4 - 5 m)
- 17 - 26 Ft. (5 - 8 m)

Phase I PDI Sample Locations

- 0.05 Ft (0.02 m) Surficial Sediment Grab (For MNR)

Proposed Phase II PDI Sample Locations

- 3.3 Ft (1 m) Core (Sample 0-0.5 Ft and 0.3-3.3 Ft)
- 20 Ft (6 m) Core (Sample 0-0.5 Ft, 0.5-3.3 Ft and 3.3 Ft intervals to 20 Ft)
- 0.5 Ft Core

Mean PECQ > 1 within the top 1 meter

NOTES

1. Bathymetry contour interval = 10 feet
2. Water depth based on average lake elevation of 362.82 feet.

0 300 600 1,200 1,800 2,400 3,000
Feet

FIGURE 9.B

Honeywell

Onondaga Lake
Syracuse, New York

SMU 8
Proposed Phase II PDI Sample Locations

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