ONONDAGA LAKE 2014
MONITORED NATURAL RECOVERY
DATA SUMMARY REPORT

Prepared For:

Honeywell

301 Plainfield Road, Suite 330
Syracuse, NY 13212

Prepared By:

PARSONS

301 Plainfield Road, Suite 350
Syracuse, New York 13212

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BSQV	bioaccumulation-based sediment quality value
cm	centimeter
DUSR	Data Usability Summary Report
ft.	feet
mg/kg	milligrams per kilogram
MNR	monitored natural recovery
NYSDEC	New York State Department of Environmental Conservation
QAPP	quality assurance project plan
ROD	Record of Decision
SMU	sediment management unit
UFI	Upstate Freshwater Institute
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

Surface sediment mercury concentrations in the profundal (deep water) zone of Onondaga Lake have been declining naturally for many years and are continuing to decline based on results from 2014. These concentrations are approaching the remediation goals for mercury identified in the Record of Decision (ROD) for the lake bottom prepared in 2005 by the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA) (NYSDEC and USEPA 2005). The 2014 results, viewed in conjunction with data from previous years, clearly indicate that natural recovery is ongoing and that conditions in incoming deposited sediment and the surface sediment mixed layer are anticipated to support continued natural recovery of profundal zone surface sediments in the future.

Monitored natural recovery (MNR) was included as a significant component of the ROD's remedy for profundal zone sediments in Onondaga Lake. The primary mechanism by which profundal zone surface sediment mercury concentrations are declining is burial by incoming clean sediments that are continually being deposited from overlying water. The profundal zone of Onondaga Lake is where water depths are at least 30 feet (ft.) and waters stratify thermally typically from mid-May through mid-October. Sediments in the profundal zone of Onondaga Lake are referred to as Sediment Management Unit 8 (SMU 8).

This report documents the 2014 natural recovery monitoring activities in Onondaga Lake. The 2014 MNR work scope consisted of surface sediment sampling and analysis for mercury at 20 locations and three sediment depths at each location; visual observations of frozen cores of SMU 8 sediment collected at representative locations and sliced from top to bottom; and mercury and suspended solids analyses of slurry from sediment traps that were deployed and retrieved at one location every six to eight days from mid-May through early-November (plus a final trap deployed for two weeks from early to mid-November). This work was completed in accordance with a work plan approved in advance by NYSDEC (Parsons and Anchor QEA 2014).

Other results from 2014 MNR efforts in Onondaga Lake are as follows:

- Sediment trap results show deposition of solids is ongoing at a rate higher than the deposition rate applied as part of the MNR design to project future natural recovery of surface sediments in SMU 8 (Parsons and Anchor QEA 2012).
- The average mercury concentration in sediment settling in SMU 8 during 2014 was 0.91 milligrams per kilogram (mg/kg), which is less than mercury concentrations during remediation assumed within the design to project future natural recovery.
- Three of the four SMU 8 frozen sediment cores assessed in 2014 showed layering within the top 2 centimeters (cm) (0.8 inch) of sediment, starting at sediment depths between 0.5 and 1.75 cm (between 0.2 and 0.7 inches). This indicates that vertical mixing of sediment at those locations is limited to sediments shallower than the compliance depth of 4 cm (1.6 inches) identified in the design. The fourth frozen SMU 8 sediment core assessed in 2014 showed layering and the presence of microbead marker at a sediment depth of 7 cm, which indicates a sediment deposition rate at that location of 1.3 cm per year since the marker was placed in mid-2009.

SECTION 1

INTRODUCTION

1.1 BACKGROUND AND OBJECTIVES

Natural recovery is a significant component of the remedy for sediment located in Onondaga Lake's profundal zone (called SMU 8). Water depths in the profundal zone are 30 ft. or more, and waters stratify thermally in the vertical dimension typically from mid-May through mid-October. Natural recovery is a result of gradual burial of older sediment by new sediment with lower mercury concentrations entering the lake from tributary inflows and direct runoff. Mercury concentrations in sediment entering the lake are expected to continue to decline as remediation of Onondaga Lake upland sources, dredging and/or isolation capping of portions of littoral zone sediments, and initial thin-layer capping in small portions of the profundal zone are completed.

The remedy for natural recovery in SMU 8 is described in the Design for Capping, Dredging, Habitat and Profundal Zone (Parsons and Anchor QEA, 2012) and includes monitoring surface sediment mercury concentrations every three years (which began in 2011) and contingency procedures as warranted. Potential contingency procedures include additional modeling of future natural recovery (based on the MNR model used during the design) and additional thin-layer capping in SMU 8. However, results of 2014 MNR monitoring indicate that natural recovery is proceeding as expected. Therefore, neither contingency modeling nor additional thin-layer capping is needed at this time other than additional capping that may be needed in small portions in SMU 8 associated with cap movement areas in Remediation areas C and D.

Remediation goals for MNR are specified in the design and are to be met within ten years following completion of remediation of upland sources, dredging and/or isolation capping of a portion of littoral sediments, and thin-layer capping of a small portion of profundal zone sediments. The remediation goals are to:

- Achieve the mercury probable effects concentration of 2.2 mg/kg at each SMU 8 location
- Achieve the mercury bioaccumulation-based sediment quality value (BSQV) of 0.8 mg/kg on an area-wide basis for each of five sub-areas that make up the entire lake (North Basin, Ninemile Creek Outlet Area, Saddle, South Basin and South Corner).

These remediation goals for mercury are to be met within a vertical interval of surface sediment that is relevant to potential exposures to organisms intended to be protected. This vertical interval of sediment, referred to herein as a "compliance depth," was identified in the design to be the top 4 cm (1.6 inches or 0.13 ft.) of sediment. Currently, remediation of upland sources and lake sediments are projected to be completed in 2016 which means the remediation goals for SMU 8 sediment need to be met by the year 2026.

In addition to monitoring surface sediment mercury concentrations, other types of sampling completed in 2014 and described in this report are collection and analysis of sediment trap slurry samples and visual observations of frozen sediment cores.

Another line of evidence for natural recovery implemented in Onondaga Lake was placement and subsequent observation of microbead markers to quantify depths of sediment depositing since the marker was placed (Parsons and Environmental Tracing Systems, 2014). Microbead markers were placed in mid-2009 at nine different plots in SMU 8. The sand microbead marker is fluorescent, thereby providing a visual top of sediment demarcation for the mid-2009 timeframe that can be compared with future sediment depths above the sand marker. The sand marker has been visually observed in SMU 8 sediment cores collected from microbead plots that were subsequently frozen and sliced from top to bottom so that visual observations could be completed. The other microbead marker placed in 2009 was a silt marker to help assess sediment mixing. However, field observations of frozen cores for evidence of sediment layering is now considered to be a more definitive determination of sediment mixing depth than laboratory measurements of silt marker presence.

This Data Summary Report presents information collected and results of analyses performed in 2014 on surface sediment, frozen shallow sediment cores, and sediment trap slurry samples collected in SMU 8. Sampling and analyses were conducted in accordance with the following documents:

- Onondaga Lake Natural Recovery Monitoring Work Plan for 2014-2015 (Parsons and Anchor QEA 2014) for SMU 8 sediment sampling approved in advance by the NYSDEC
- Quality Assurance Project Plan (QAPP) for Onondaga Lake Construction and Post-Construction Media Monitoring (Surface Water, Biota and Sediment) (Parsons. Anchor QEA and Upstate Freshwater Institute [UFI] 2012).

Additional natural recovery monitoring is planned for 2015 as specified in the approved work plan and beyond 2015 as outlined in Section 3.2 of this report.

1.2 REPORT ORGANIZATION

This report is organized into four sections following an executive summary:

- Section 1: Introduction
- Section 2: 2014 SMU 8 Sediment Sampling and Analyses
- Section 3: Natural Recovery Progress to Date and Path Forward
- Section 4: List of References

Three appendices are also included with this report. Appendix A presents observations from visual inspections of four cores collected in October 2014. These cores were frozen and then sliced from top to bottom to document sediment layering over time as one line of natural recovery evidence. Appendix B describes the 20 surface sediment cores collected throughout SMU 8 in 2014. The surface sediment cores were segmented into three different sediment depth intervals and analyzed for mercury and solids content. Appendix C presents the Data Usability Summary Report (DUSR). Chemical analytical data generated by Accutest Laboratories were reviewed and validated by Parsons for usability in accordance with data validation procedures described in the DUSR.

SECTION 2

2014 SMU 8 SEDIMENT SAMPLING AND ANALYSES

2.1 LAKE SAMPLING ACTIVITIES

Sediment sampling in SMU 8 during 2014 consisted of the following activities:

1. Surface sediment cores were collected at 20 SMU 8 locations, segmented into three different sediment depth intervals. Sediment samples from these cores were analyzed for total mercury at Accutest Laboratories. The sediment depth intervals were 0 to 2 cm (0.8 inch or 0.07 ft.), 2 to 4 cm (0.8 to 1.6 inch or 0.07 to 0.13 ft.), and 4 to 10 cm (1.6 to 3.9 inch or 0.13 to 0.33 ft.). The 20 locations (shown in Figures 1 and 2) were widespread throughout SMU 8, consistent with locations specified in the approved work plan (Parsons and Anchor QEA 2014). At the request of NYSDEC to allow for proper interpretation of the results, each of these cores was checked for the presence of cap material that was previously placed in portions of the littoral zone and SMU 8. Cap material was not visible in any of these SMU 8 cores.

2. Four sediment cores were collected from the sediment surface to at least 2 ft. below the sediment surface. These cores were frozen and subsequently examined for sediment deposition in recent years and for evidence of sediment mixing in the vertical dimension (or lack thereof). Two cores were collected from the South Basin/South Corner, and two cores were collected from the North Basin. As discussed in Section 3.2 below, six cores (two in each of three microbead plot areas as per the work plan) will be collected in 2015 with improved positioning accuracy.

FROZEN CORES EXAMINED IN 2014 FOR SEDIMENT DEPOSITION AND SURFACE MIXING

Location ID	Water Depth (Feet)	Depth of Recovered Sediment (Feet)	Core Penetration Depth (Feet)
OL-MB-80094-14-01	54	2.2	2.5
OL-MB-80098-14-01	62	2.0	2.5
OL-MB-80101-14-01	49	2.8	3
OL-MB-80069-14-01	51	2.8	3

Following collection, the cores were maintained in a vertical position, frozen quickly, and sliced from top to bottom during the week following collection to assess the extent of layering of sediment (also sometimes referred to as varves, laminations, or striations). The work plan called for these cores to be collected from plots of microbead marker placed in 2009. However, only the core from location OL-MB-80069-14-01 showed a microbead marker layer.

3. UFI collected sediment trap slurry samples using the same sediment trap design and deployment protocols employed annually beginning in 2009. A set of three cylindrical traps was deployed weekly from May 12 until November 3, 2014. The final deployment covered a two week period from November 3 to November 17. Sediment traps were deployed at the South Deep location at a water depth of approximately 33 ft. (10 meters), which is below the thermocline for most of the summer stratification period. Sediment trap samples were collected continuously over seven-day periods. Slurry from the sediment traps was analyzed at Accutest Laboratories for low-level total mercury and at UFI's laboratory for total suspended and total fixed solids (also called non-volatile solids).

2.2 SEDIMENT MERCURY RESULTS

Table 1 and Figures 1 and 2 present mercury analytical results from surface sediment samples collected during 2014 at 20 locations in SMU 8. Figures 1 and 2 also present mercury results from surface sediment samples collected in prior years. Results are presented for each of the five sub-areas included in the design, which from north to south are the North Basin, Ninemile Creek Outlet Area, Saddle (between the North and South Basin), South Basin, and South Corner. Similar to historical results, SMU 8 sediment mercury results for 2014 from the top 4 cm (1.6 inches or 0.13 ft.) of sediment correspond to the sediment compliance depth. Mercury results from the top two sediment intervals presented in Table 1 were averaged to obtain a mercury concentration from 0 to 4 cm as shown in Table 2. All of the compliance depth average concentrations in Table 2 are less than the mercury probable effects concentration of 2.2 mg/kg, which is the remediation goal for mercury at each SMU 8 sediment location. The highest average concentration measured in 2014 in the top 4 cm was 1.3 mg/kg (approximately 60 percent of the probable effects concentration remediation goal). This concentration was in a sample collected in the South Corner of the lake. In addition, estimated surface-weighted average sediment mercury concentrations inclusive of the littoral zone and SMU 8 have declined since the time of the Final Design to concentrations that are close to or have reached the BSQV for mercury of 0.8 mg/kg in all of the zones of Onondaga Lake except the South Basin. For the South Basin zone, although the estimated average concentration (1.9 mg/kg) is above the BSQV, this value is less than the value estimated in the design for this zone immediately following dredging and capping (2.5 mg/kg, as per Appendix N) and is projected to fall below the BSQV within the 10-year MNR period.

Mercury results for locations where surface sediment mercury has been monitored on more than one occasion over time between sampling events are presented in Table 3 and in a series of bar charts presented as Figure 3. As shown in Table 3 and Figure 3, SMU 8 surface sediment mercury concentrations are continuing to decline, which indicates that natural recovery is ongoing.

Validation of sediment mercury results was completed as described in the DUSR, which is provided in Appendix C.

2.3 OBSERVATIONS OF FROZEN SEDIMENT CORES

Three of the four SMU 8 sediment cores collected and frozen in 2014 showed layering starting at sediment depths between 0.5 and 1.75 cm (0.2 and 0.7 inch). Preservation of layering is direct evidence that deposited sediments are not mixing beyond sediment depths where layers are observed. The depth to the start of layering in the three cores is well within the 4 cm (1.6 inch) compliance depth established in the design. Sediment layering and a visible marker of microbead material were observed in the fourth frozen core (OL-MB-80069-14-01) at a sediment depth of 7 cm (2.8 inches). The presence of sand microbead marker at 7 cm, with minimal disturbance of that marker, suggests that the top 7 cm in this core represent recently deposited and undifferentiated material; additionally, the lack of layering indicates that there is the potential for mixing below the 4 cm compliance depth at this location. Monitoring for mixing below the compliance depth will continue to be monitored as per the design. The rate of recent deposition at that location can be quantified as 7 cm over 5.3 years since the microbead marker was placed. This corresponds to a localized deposition rate of 1.3 cm per year. A sedimentation rate of 0.25 grams per square cm per year and a sediment bulk density of 0.243 grams per cubic centimeter were applied as part of the SMU 8 MNR model used in the design. These rates correspond to an average deposition rate of 1.0 cm per year.

Detailed descriptions and photographs for each of the four 2014 frozen sediment cores are presented in Appendix A.

2.4 SEDIMENT TRAP RESULTS

Table 4 presents total suspended solids and mercury concentrations in sediment slurry and calculated mercury concentrations on solids from sediment traps deployed at the South Deep location in SMU 8 from May 12 to November 17, 2014. South Deep is located in the north end of the South Corner of SMU 8 (Figure 2). Sediment trap results provide another line of evidence that natural recovery of the profundal surface sediments is continuing. Solids are continuing to deposit into SMU 8 from upland and littoral zone lake locations. In addition, mercury concentrations in solids settling into SMU 8 are lower than concentrations of mercury in surface sediment at the north end of the South Corner in the vicinity of the South Deep location.

Average deposition of suspended solids into SMU 8 based on the 2014 sediment trap samples collected from mid-May to mid-September was 17,800 mg per square meter per day (and 15,000 mg per square meter per day from June through September when the sediment traps were below the lake's thermocline). Concentrations of fixed solids and volatile solids in 2014 sediment trap slurry samples ranged from 1,560 to 12,400 and 168 to 1,520 milligrams per liter, respectively. Volatile solids are quantified as the difference between total suspended solids and total fixed solids.

Rates of solids deposited in sediment traps in 2014 were higher than in 2011-2013, while mercury concentrations measured on sediment trap solids in 2014 were within the range of prior year average annual concentrations (Table 5). Deposition of solids from 2011 through 2014 was higher than the solids deposition rate of 6,850 mg per square meter per day (or 0.25 grams per square cm per year) used in the MNR model applied as part of the design (Parsons and Anchor QEA 2012).

Mercury concentrations in sediment trap solids collected in 2014 ranged from 0.37 to 3.52 mg/kg, with a mean of 0.91 mg/kg (Table 4), while mean mercury concentrations recorded for sediment trap solids at South Deep from 2011 through 2013 were 0.7 mg/kg, 1.1 mg/kg and 0.57 mg/kg, respectively (Table 5). Mean sediment trap mercury concentrations measured from 2011-2014 are lower than the settling sediment mercury concentration applied in the MNR model during the design (1.9 mg/kg from the South Corner of SMU 8 for the 2011-2014 time period prior to completion of dredging and/or isolation capping in portions of the littoral zone and thin-layer capping in a portion of SMU 8). Mean mercury concentrations in sediment trap solids from 2011-2014 are also lower than mercury concentrations observed in surface sediment in the vicinity of the South Deep location (typically 1.2 to 1.7 mg/kg in the north end of the South Corner in SMU 8 during 2014 (Figure 2)). Mercury deposition rates in 2014 averaged 15.5 micrograms per square meter per day (and 11.6 micrograms per square meter per day from June through September when the traps were below the lake's thermocline).

It is possible that suspended material from capping activities in 2014 may have increased sediment deposition in the sediment traps. If this is the case, the deposition rates documented in 2014 may not reflect future conditions when capping is completed. Consistent with the Final Design, should surface sediment data in future years indicate that the recovery is progressing slower than anticipated, then evaluations of the underlying mechanisms will be conducted at that time.

Validation of sediment trap mercury results was completed as described in the DUSR, which is provided in Appendix C.

SECTION 3

NATURAL RECOVERY PROGRESS TO DATE AND PATH FORWARD

3.1 PROGRESS TO DATE

The 2014 surface sediment mercury results from SMU 8 show sediment mercury concentrations are continuing to decline over time. Surface sediment mercury concentrations are now below the mercury probable effects concentration of 2.2 mg/kg that is the goal to be achieved at each SMU 8 sediment location.

Three of the four frozen sediment cores collected and observed in 2014 showed layering starting at sediment depths between 0.5 and 1.75 cm (0.2 and 0.7 inch), which is well within the 4 cm (1.6 inches) compliance depth for mixing established in the design. The fourth core showed a depth of 7 cm (2.8 inches) to the first layering and to the visible sand microbead marker indicating deposition of relatively undifferentiated material on top the marker.

Sediment trap results for 2011-2014 show deposition of solids continues to be higher than the deposition rate applied in the MNR model that was part of the design. Mercury concentrations in sediment that settled at the South Deep location from 2011-2014 are lower than the settling sediment mercury concentration applied in the MNR model as part of the design. In addition, mercury concentrations in sediment that settled at the South Deep location from 2011-2014 are lower than recent surface sediment mercury concentrations in the vicinity of the South Deep location.

The 2014 results presented in this report, viewed in conjunction with data from recent prior years (2011 through 2014), clearly indicate that natural recovery is continuing to take place. Further, conditions in sediment entering SMU 8 and the surface sediment mixed layer in SMU 8 (i.e., the top 4 cm) are expected to support continued natural recovery of the profundal surface sediments in the future. Based on the 2014 results, no additional contingency modeling of natural recovery is warranted at this time. Mercury concentrations are expected to continue to decline as remediation of upland sites and sediment in the lake is completed.

3.2 PATH FORWARD

The following efforts are being planned for 2015 to continue to monitor natural recovery in Onondaga Lake:

- Two sediment cores will be collected from each of three different microbead plots, frozen, sliced from top to bottom, and visually assessed for layering to evaluate the extent of vertical mixing. The presence of microbead markers will also be observed to assess deposition that has taken place since microbeads were placed in 2009. Microbead plot perimeters and prior sediment sample locations will be scaled and plotted for field team use to improve the ability to locate 2015 samples inside microbead plots.
- Sediment traps will be deployed, retrieved and analyzed at the same frequency as in 2014.

- In accordance with the work plan for natural recovery monitoring in 2014-2015 (Parsons and Anchor QEA 2014), benthic macroinvertebrates will be collected at 11 locations representing both geographic areas and different water depths within SMU 8. Benthic macroinvertebrates can, if present in significant numbers, increase the extent to which sediment is mixed vertically. This, in turn, could affect ongoing natural recovery. A core will also be collected at each of the 11 benthic macroinvertebrate sample locations. These cores will be frozen and subsequently sliced from top to bottom to assess sediment layering as evidence of likely mixed layer depths as was done at four locations in 2014.

Surface sediment samples will next be collected in 2017 from multiple SMU 8 locations and analyzed for mercury in accordance with the monitoring and contingency approach to natural recovery specified in the final design. Beyond 2017 natural recovery monitoring will continue every three years, and potential contingency work will continue to be considered where indicated by ongoing monitoring results.

SECTION 4

REFERENCES

NYSDEC and USEPA Region 2, 2005. *Record of Decision, Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site*. July 2005.

Parsons and Anchor QEA, 2012. *Onondaga Lake Capping, Dredging, Habitat and Profundal Zone (Sediment Management Unit 8) Final Design*. Prepared for Honeywell. March 2012.

Parsons, Anchor QEA, and UFI, 2012. *Quality Assurance Project Plan for Onondaga Lake Construction and Post-Construction Media Monitoring (Surface Water, Biota and Sediment).* Prepared for Honeywell. December 2012. Draft.

Parsons and Anchor QEA, 2014. *Onondaga Lake Natural Recovery Monitoring Work Plan for 2014-2015*. Prepared for Honeywell. September 2014.

Parsons and Environmental Tracing Systems, 2014*. Onondaga Lake Sediment Management Unit 8 Microbead Marker Placement Report*. Prepared for Honeywell. December 2014.

TABLES

TABLE 1

SUMMARY OF MERCURY MEASURED DURING 2014 IN SMU 8 SEDIMENT SAMPLES

NORTH HALF OF SMU 8 (from north to south; see Figure 1)				SOUTH HALF OF SMU 8 (from north to south; see Figure 2)			
Location ID	**Sample Depth, ft**	**Mercury mg/kg**	**Solids, Percent (%)**	**Location ID**	**Sample Depth, ft**	**Mercury mg/kg**	**Solids, Percent (%)**
North Basin				**South Basin**			
OL-STA-80068	0 to 0.07	0.7 J	18.4	OL-STA-80076	0 to 0.07	0.91 J	21.8
OL-STA-80068	0.07 to 0.13	0.72 J	21.1	OL-STA-80076	0.07 to 0.13	0.95 J	18.3
OL-STA-80068	0.13 to 0.32	1.4 J	23.5	OL-STA-80076	0.13 to 0.32	0.81 J	23.1
OL-STA-80225	0 to 0.07	0.63 J	17	OL-STA-80078	0 to 0.07	1 J	24.5
OL-STA-80225	0.07 to 0.13	0.66 J	18.2	OL-STA-80078	0.07 to 0.13	1 J	20.8
OL-STA-80225	0.13 to 0.33	1.1 J	23.6	OL-STA-80078	0.13 to 0.33	1.7 J	25.6
OL-STA-80069	0 to 0.07	0.61 J	24.3	OL-STA-80229	0 to 0.07	0.73 J	22.8
OL-STA-80069	0.07 to 0.13	0.81 J	22.7	OL-STA-80229	0.07 to 0.13	0.91 J	22.9
OL-STA-80069	0.13 to 0.33	1.2 J	28.5	OL-STA-80229	0.13 to 0.32	1.3 J	25
OL-VC-80157	0 to 0.07	0.6 J	19.1	OL-STA-80080	0 to 0.07	0.86 J	21.9
OL-VC-80157	0.07 to 0.13	0.71 J	18.2	OL-STA-80080	0.07 to 0.13	0.74 J	24.2
OL-VC-80157	0.13 to 0.32	2 J	23.4	OL-STA-80080	0.13 to 0.33	1.3 J	24
OL-VC-80157	0.13 to 0.32	0.96 J	26.2	OL-STA-80080	0.13 to 0.33	2.2 J	14.5
Ninemile Creek Outlet Area				OL-STA-80082	0 to 0.07	0.88 J	23.3
OL-STA-80226	0 to 0.07	0.67 J	29.1	OL-STA-80082	0.07 to 0.13	1 J	20
OL-STA-80226	0.07 to 0.13	1.2 J	27.3	OL-STA-80082	0.13 to 0.33	1.6 J	20.9
OL-STA-80226	0.13 to 0.32	1.5 J	26.4	OL-STA-80084	0 to 0.07	1.1 J	28.8
OL-STA-80227	0 to 0.07	1.1 J	23.6	OL-STA-80084	0.07 to 0.13	1.2 J	28.5
OL-STA-80227	0.07 to 0.13	1.3 J	27.5	OL-STA-80084	0.13 to 0.32	1.1 J	35.5
OL-STA-80227	0.13 to 0.33	1.5 J	35.4	**South Corner**			
OL-STA-80073	0 to 0.07	0.84 J	25.7	OL-STA-80085	0 to 0.07	0.72 J	30.6
OL-STA-80073	0.07 to 0.13	0.9 J	26.2	OL-STA-80085	0.07 to 0.13	1.8 J	18.4
OL-STA-80073	0.13 to 0.33	1.5 J	28.3	OL-STA-80085	0.13 to 0.33	1.6 J	27.5
Saddle				OL-VC-80172	0 to 0.07	1.1 J	29.8
OL-STA-80234	0 to 0.07	0.8 J	22.4	OL-VC-80172	0.07 to 0.13	1.3 J	29.4
OL-STA-80234	0.07 to 0.13	0.57 J	40.6	OL-VC-80172	0.13 to 0.33	1.4 J	25.5
OL-STA-80234	0.13 to 0.33	1.4 J	27.7	OL-VC-80172	0.13 to 0.33	2.2 J	25.3
OL-STA-80103	0 to 0.07	0.81 J	25.6	OL-STA-80088	0 to 0.07	1.2 J	25.8
OL-STA-80103	0.07 to 0.13	1.1 J	24.4	OL-STA-80088	0.07 to 0.13	1.2 J	23.7
OL-STA-80103	0.13 to 0.32	1.7 J	30.6	OL-STA-80088	0.13 to 0.32	1.5 J	19.4
OL-STA-80103	0.13 to 0.32	2.2 J	23	OL-VC-80177	0 to 0.07	1 J	25.6
OL-STA-80075	0 to 0.07	0.68 J	26.2	OL-VC-80177	0.07 to 0.13	1.5 J	29.4
OL-STA-80075	0.07 to 0.13	0.69 J	25.6	OL-VC-80177	0.13 to 0.32	1.7 J	22.7
OL-STA-80075	0.13 to 0.33	1.2 J	24.8				

Notes: (1) Samples were collected on October 20 and 22, 2014.
(2) A 'J' qualifier (meaning the value is estimated) was added during data validation based on the low solids content of the samples.

TABLE 2

AVERAGE 2014 SURFACE SEDIMENT MERCURY CONCENTRATIONS (TOP 0.13 FOOT (4 CENTIMETERS))

Location ID	Average Concentration (mg/kg)	Below Probable Effects Concentration of 2.2 mg/kg?
NORTH HALF		
North Basin		
OL-STA-80068	0.71	Yes (Y)
OL-STA-80225	0.65	Y
OL-STA-80069	0.71	Y
OL-VC-80157	0.66	Y
Ninemile Creek Outlet		
OL-STA-80226	0.94	Y
OL-STA-80227	1.2	Y
OL-STA-80073	0.87	Y
Saddle		
OL-STA-80234	0.69	Y
OL-STA-80103	0.96	Y
OL-STA-80075	0.69	Y
SOUTH HALF		
South Basin		
OL-STA-80076	0.93	Y
OL-STA-80078	1.0	Y
OL-STA-80229	0.82	Y
OL-STA-80080	0.80	Y
OL-STA-80082	0.94	Y
OL-STA-80084	1.2	Y
South Corner		
OL-STA-80085	1.26	Y
OL-VC-80172	1.2	Y
OL-STA-80088	1.2	Y
OL-VC-80177	1.3	Y

NOTES:

(1) Concentrations are averaged from the 0 to 0.07 ft. and 0.07 to 0.13 ft. depth intervals presented in Table 1.
(2) 0.13 ft. is the SMU 8 sediment compliance depth as presented in the design (Parsons and Anchor QEA 2012).

TABLE 3

CHANGES IN SMU 8 SURFACE SEDIMENT MERCURY CONCENTRATIONS AT THE SAME LOCATION OVER TIME

	Depth Interval (ft)		Year	Surface Sediment Mercury Concentration		Year	Surface Sediment Mercury Concentration	Change in Concentraton Over Time
NORTH HALF OF SMU 8								
North Basin								
OL-STA-80068	0-0.07		2007	1.1		2014	0.7	-0.4
OL-STA-80225	0-0.13		2011	1.1		2014	0.7	-0.5
OL-STA-80069	0-0.07		2007	1.2		2014	0.6	-0.6
OL-VC-80157	0-0.13		2010	1.3		2014	0.7	-0.6
Ninemile Creek Outlet								
OL-STA-80226	0.0.13		2011	1.6		2014	0.9	-0.7
OL-STA-80227	0-0.13		2011	1.7		2014	1.2	-0.5
OL-STA-80073	0-0.07		2007	1.5		2014	0.8	-0.7
Saddle								
OL-STA-80234	0-0.13		2011	1.1		2014	0.7	-0.4
OL-STA-80103	0-0.07		2008	1.5		2014	0.8	-0.7
OL-STA-80075	0-0.07		2007	1.6		2014	0.7	-0.9
SOUTH HALF OF SMU 8								
South Basin								
OL-STA-80076	0-0.07		2007	1.4		2014	0.9	-0.5
OL-STA-80078	0-0.07		2007	1.6		2014	1.0	-0.6
OL-STA-80229	0-0.13		2011	1.1		2014	0.8	-0.3
OL-STA-80080	0-0.07		2007	1.4		2014	0.9	-0.5
OL-STA-80082	0-0.07		2007	1.6		2014	0.9	-0.7
OL-STA-80084	0-0.07		2007	1.7		2014	1.1	-0.6
South Corner								
OL-STA-80085	0-0.07		2007	1.9		2014	0.7	-1.2
OL-VC-80172	0-0.13		2010	1.4		2014	1.2	-0.2
OL-STA-80088	0-0.07		2007	2.3		2014	1.2	**-1.1**
OL-VC-80177	0-0.13		2010	1.6		2014	1.3	-0.3

Note: Concentrations are in milligrams per kilogram (mg/kg) which is equivalent to parts per million.

TABLE 4

2014 SEDIMENT TRAP SLURRY MERCURY AND SOLIDS CONTENT RESULTS
(Traps set at 10-meter(33-foot) water depth)

Site	Trap Deploy Date	Trap Recover Date	Deployment Duration (Days)	Sample Volume (mL)	Slurry Mercury Results (µg/L)	Triplicate Total Suspended Solids (TSS) Results (mg/L)	TSS Average (mg/L)	TSS Deposition (mg per m2 per day)	Mercury Concentration (mg/kg)	Mercury Deposition (µg per m^2 per day)
SD	05/12/14	05/20/14	8	121	9.91	6952 / 6408 / 6544	6635	22122	1.49	33.04
SD	05/20/14	05/27/14	7	121	-	3400 / 3512 / 3916	3609	13752	-	-
SD	05/27/14	06/02/14	6	124	9.55	2700 / 2552 / 2884	2712	12355	3.52	43.51
SD	06/02/14	06/09/14	7	126	-	4848 / 4956 / 5224	5009	19875	-	-
SD	06/09/14	06/16/14	7	128	1.92	3380 / 3344 / 5008	3911	15765	0.49	7.74
SD	06/16/14	06/23/14	7	134	-	2136 / 2624 / 2244	2335	9853	-	-
SD	06/23/14	06/30/14	7	127	2.08	3216 / 3272 / 3604	3364	13454	0.62	8.32
SD	06/30/14	07/07/14	7	130	-	3336 / 3640 / 3468	3481	14251	-	-
SD	07/07/14	07/14/14	7	120	3.20	3772 / 3440 / 4172	3795	14341	0.84	12.09
SD	07/14/14	07/21/14	7	135	-	3596 / 3192 / 3668	3485	14816	-	-
SD	07/21/14	07/28/14	7	132	3.64	3440 / 3760 / 4332	3844	15979	0.95	15.13
SD	07/28/14	08/04/14	7	137	-	2460 / 2616 / 2500	2525	10893	-	-
SD	08/04/14	08/11/14	7	129	2.81	4952 / 4412 / 4280	4548	18475	0.62	11.42
SD	08/11/14	08/18/14	7	133	-	5936 / 5232 / 6720	5963	24975	-	-
SD	08/18/14	08/25/14	7	117	1.52	3860 / 3720 / 4712	4097	15095	0.37	5.60
SD	08/25/14	09/02/14	8	126	2.45	4268 / 4628 / 5144	4680	16248	0.52	8.51
SD	09/02/14	09/09/14	7	130	3.01	2852 / 2760 / 2856	2823	11557	1.07	12.32
SD	09/09/14	09/16/14	7	127	5.75	3352 / 4080 / 3912	3781	15122	1.52	23.00
SD	09/16/14	09/24/14	8	128	4.60	4156 / 4752 / 4588	4499	15868	1.02	16.22
SD	09/24/14	09/30/14	6	111	1.87	1844 / 1980 / 1972	1932	7879	0.97	7.63
SD	09/30/14	10/07/14	7	133	1.73	3244 / 2872 / 3336	3151	13197	0.55	7.25
SD	10/07/14	10/14/14	7	125	2.91	6248 / 4404 / 6236	5629	22158	0.52	11.45
SD	10/14/14	10/20/14	6	132	2.38	3936 / 4680 / 5148	4588	22250	0.52	11.54
SD	10/20/14	10/27/14	7	125	5.06	5260 / 9036 / 9788	8028	31601	0.63	19.92
SD	10/27/14	11/03/14	7	122	6.24	10948 / 13964 / 10072	11661	44800	0.54	23.97
SD	11/03/14	11/17/14	14	141	7.50	13316 / 11336 / 12176	12276	27254	0.61	16.65
SD Arithmetic Mean (rounded)			-	-	-	-	-	17800	0.91	

Legend: SD – South Deep TSS – total suspended solids

Notes: (1) Mercury concentration = slurry mercury result divided by the TSS average times a units conversion of 1,000. Concentrations are based on dry weight. Calculations of mercury and suspended solids include the surface area of the sediment traps (45 square centimeters).

(2) Solids and mercury deposition from June through September averaged 15,000 mg per square meter per day and 11.6 micrograms per square meter per day, respectively. June through September is when the sediment traps are below the thermocline and not subject to mixing within upper waters.

TABLE 5

AVERAGE MID-MAY TO MID-NOVEMBER 2011-2014 SOLIDS DEPOSITION AT THE SOUTH DEEP LOCATION IN ONONDAGA LAKE BASED ON SEDIMENT TRAP RESULTS

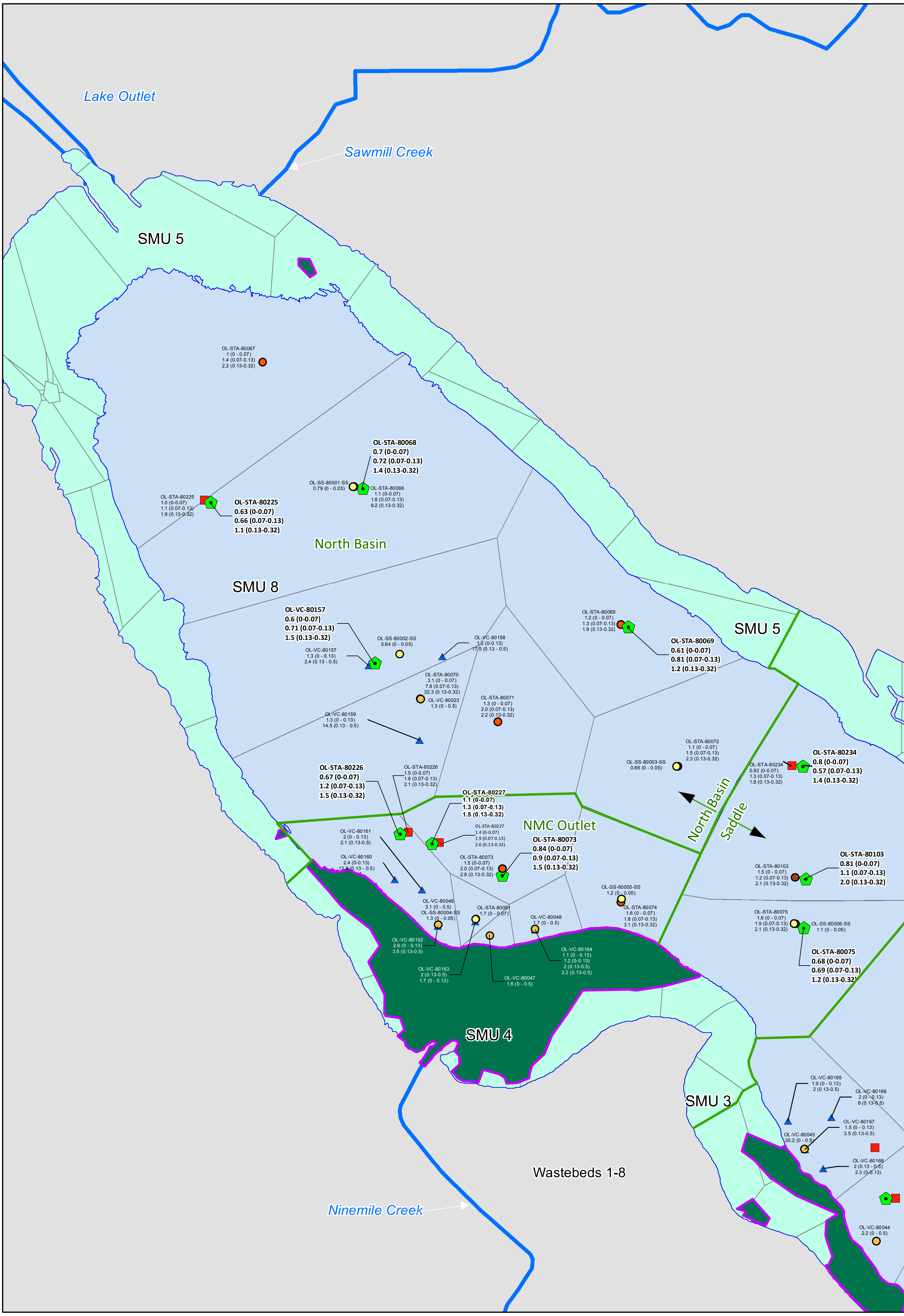
(Traps set at the 10-meter (33-foot) water depth)

Year	Number of Sediment Traps Deployed With Mercury Measured in Settling Sediment	Average Solids Deposition / Settling Rate (milligrams per square meter per day)	Average Mercury Concentration in Settling Sediment (mg/kg or part per million)
2011	18	7,800	0.7
2012	16	7,400	1.1
2013	22	11,700	0.57
2014	19	17,800	0.91

Notes:

1. Each sediment trap was typically deployed for seven days.
2. Average solids deposition from June through September when the traps are below the thermocline as follows for 2011-2014, respectively: 8,580; 6,470; 11,700; and 15,000 milligrams per square meter per day.

FIGURES



Document Path: Q:\GIS\GIS_Lake\Sediment-2015\Sediment_SMU8north_Hg_2015.mxd Date: 8/11/2015

Legend

- PDI Phase 1 (2005)
- PDI Phase 2 (2006)
- PDI Phase 3 (2007)
- PDI Phase 4 (2008)
- PDI Phase 5 (2009)
- PDI Phase 6 (2010)
- PDI Phase 7 (2011)
- Remediation Areas
- SMU 8 zone polygons based on PDI Phases 1 through 5
- Littoral zone
- OL-VC-80023 2.2 (0 - 0.3) Sediment Sample Location ID with mercury result (mg/kg) and depth interval.
- 2014 Sample Locations

NOTES

1. The 30-foot water depth contour is the boundary between the littoral zone SMUs 1-7 and SMU 8.
2. 0.X is total mercury concentration in mg/kg (ppm). (0.Y to 0.Z) is the sample depth in feet.

0 240 480 960 1,440 1,920 2,400

Feet

FIGURE 1

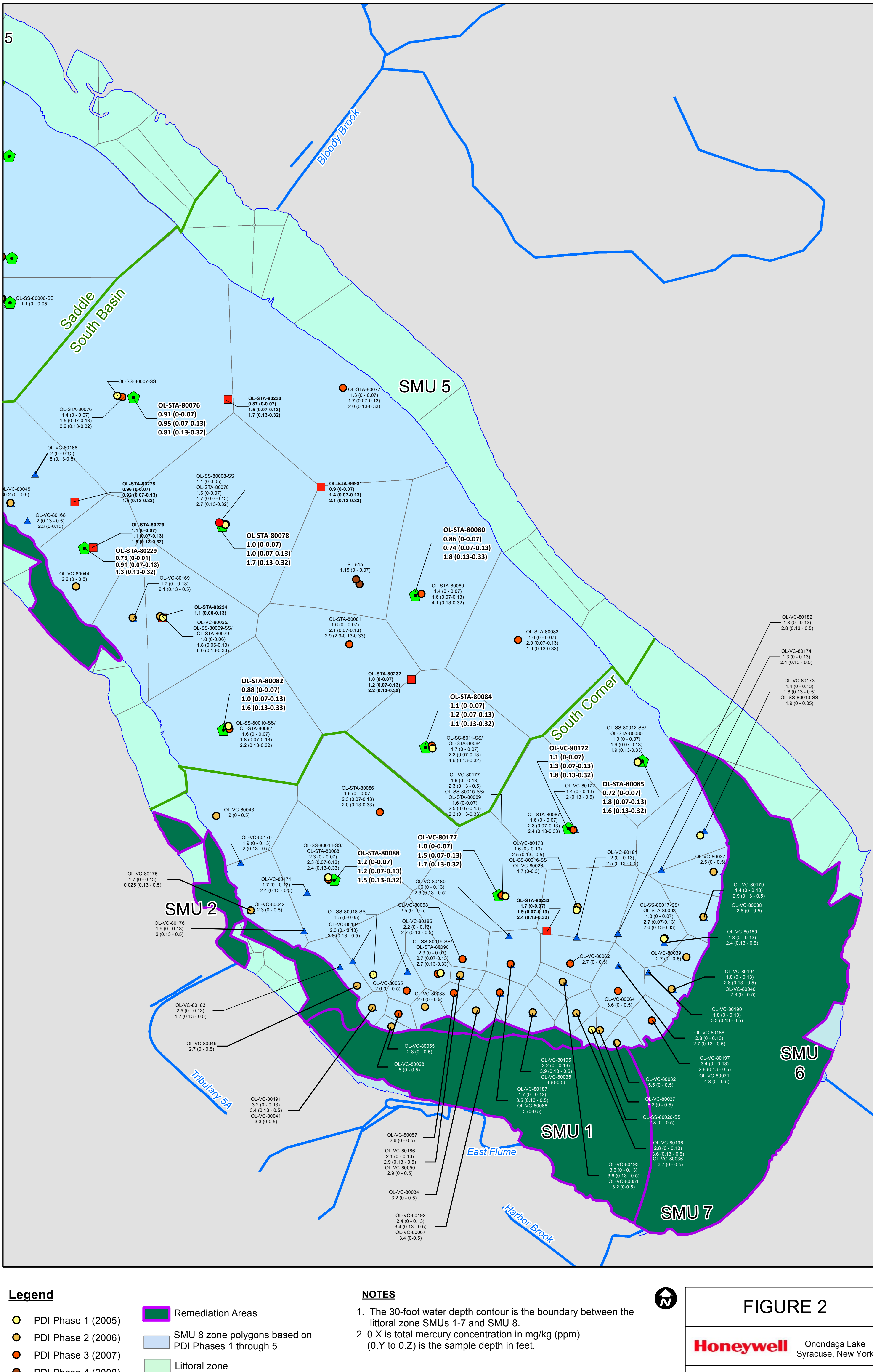
Honeywell

Onondaga Lake
Syracuse, New York

Mercury in Top Six Inches of SMU 8 Sediment in North Half of Onondaga Lake (mg/kg)

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212 Phone:(315)451-9560



Document Path: Q:\GIS\GIS_Lake\Sediment-2015\Sediment_SMU8SOUTH_Hg_2015.mxd

05/06/2010

Legend

- PDI Phase 1 (2005)
- PDI Phase 2 (2006)
- PDI Phase 3 (2007)
- PDI Phase 4 (2008)
- PDI Phase 5 (2009)
- PDI Phase 6 (2010)
- PDI Phase 7 (2011)
- Remediation Areas
- SMU 8 zone polygons based on PDI Phases 1 through 5
- Littoral zone
- OL-VC-80023 2.2 (0 - 0.3) Sediment Sample Location ID with mercury result (mg/kg) and depth interval.
- 2014 Sample Locations

NOTES

1. The 30-foot water depth contour is the boundary between the littoral zone SMUs 1-7 and SMU 8.
2. 0.X is total mercury concentration in mg/kg (ppm). (0.Y to 0.Z) is the sample depth in feet.

0 260 520 1,040 1,560 2,080 2,600

Feet

FIGURE 2

Honeywell

Onondaga Lake
Syracuse, New York

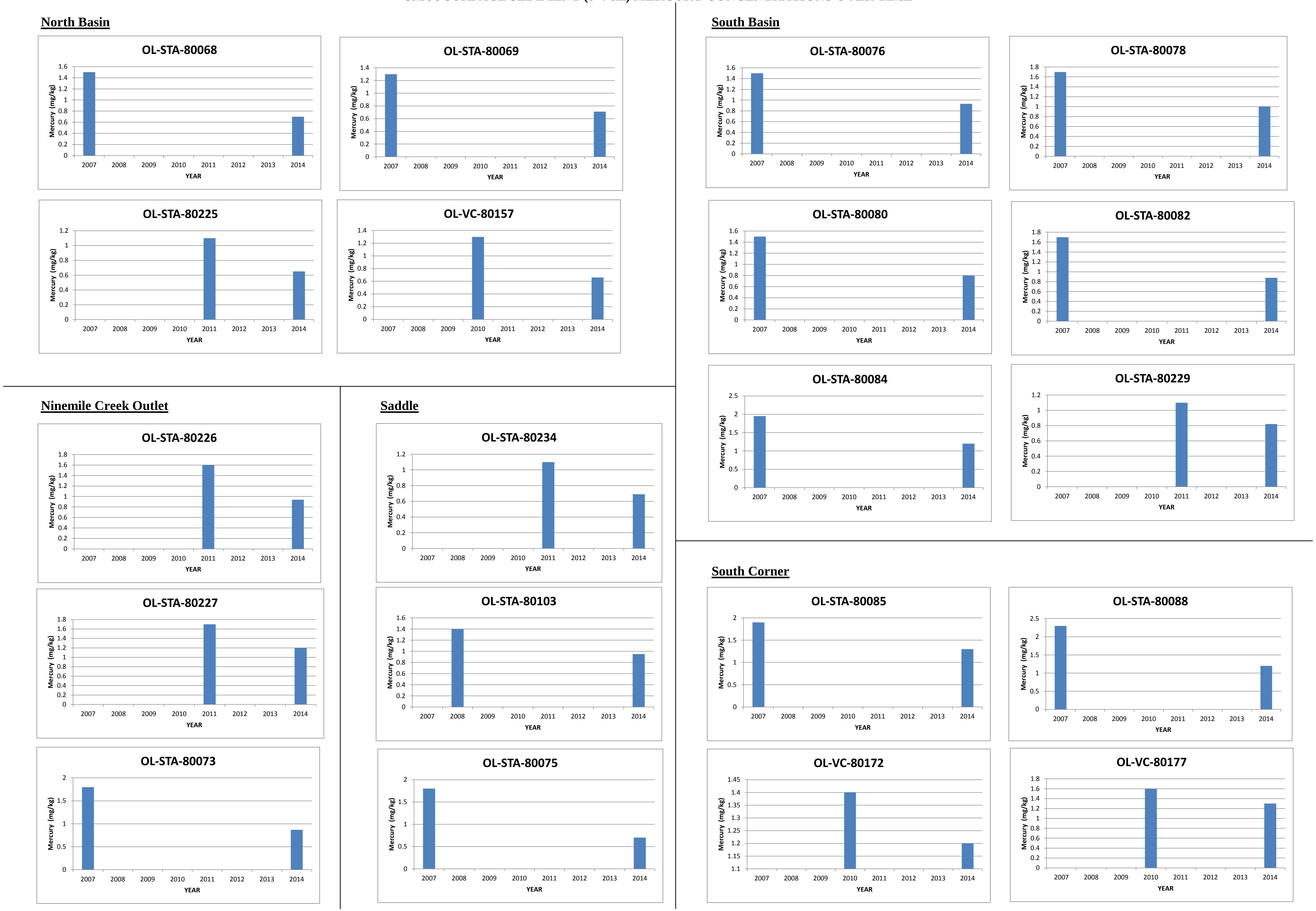
Mercury in Top Six Inches of SMU 8 Sediment in South Half of Onondaga Lake (mg/kg)

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212 Phone:(315)451-9560

FIGURE 3

BAR CHARTS OF
SMU8 SURFACE SEDIMENT (0-4 cm) MERCURY CONCENTRATIONS OVER TIME



P:\Honeywell -SYR\448918 - 2014 OL Remedial Goal Monitoring\9.0 Reports\9.4 MNR Data Summary Report\Figures\Figure 3_Surface Sed Merc Conc Graphs_081015.xlsxFigure 3_Surface Sed Merc Conc Graphs_081015.xlsx

APPENDIX A

VISUAL INSPECTION OF ONONDAGA LAKE SMU 8 FROZEN CORES COLLECTED IN 2014

290 Elwood Davis Road, Suite 340
Liverpool, New York 13088
Phone 315.453.9009
Fax 315.453.9010
www.anchorqea.com

MEMORANDUM

To:	David Babcock, Parsons	**Date:**	January 5, 2015
From:	Deirdre Reidy, Anchor QEA, LLC	**Project:**	120139-01.02
Cc:	Matthew Vetter, Parsons		
	Carl Stivers, Anchor QEA, LLC		
Re:	Visual Inspection of the Onondaga Lake Frozen Cores Collected in October 2014 in Sediment Management Unit (SMU) 8		

SUMMARY

To further assess sedimentation rates in the profundal zone of Onondaga Lake (Sediment Management Unit [SMU] 8), fluorescent microbead marker material was placed on the surface of SMU 8 sediments at nine locations within SMU 8 in June and July 2009 (Parsons and Environmental Tracing Systems 2014). The sand microbead marker has a grain size similar to sand, making it less likely to vertically mix with the silty SMU 8 sediments upon placement or sampling, thus providing a useful tool to measure the thickness of sediment deposition over the top of the marker layer (post mid-2009 sedimentation rates). Four cores were collected in October 2014 from three different areas in SMU 8, subsequently frozen, and then visually inspected. Sediment layering was observed in three of the four cores starting at depths of 0.5 to 1.75 centimeters (cm) below the core surface (also called the mudline or top of sediment). In the fourth core (OL-MB-80069-14-01), sediment layering was observed, starting at a sediment depth of 7 cm. Core OL-MB-80069-14-01 was collected at a location 300 feet laterally from core OL-MB-80094-14-01 (see Figure A-1). Each of these cores was collected in a consistent manner. Variations in sedimentation over short lateral distances could be due to small-scale variations from occurrences such as dragging an anchor. Sediment in SMU 8 has relatively low solids content (typically 20 to 25 percent).

METHODS

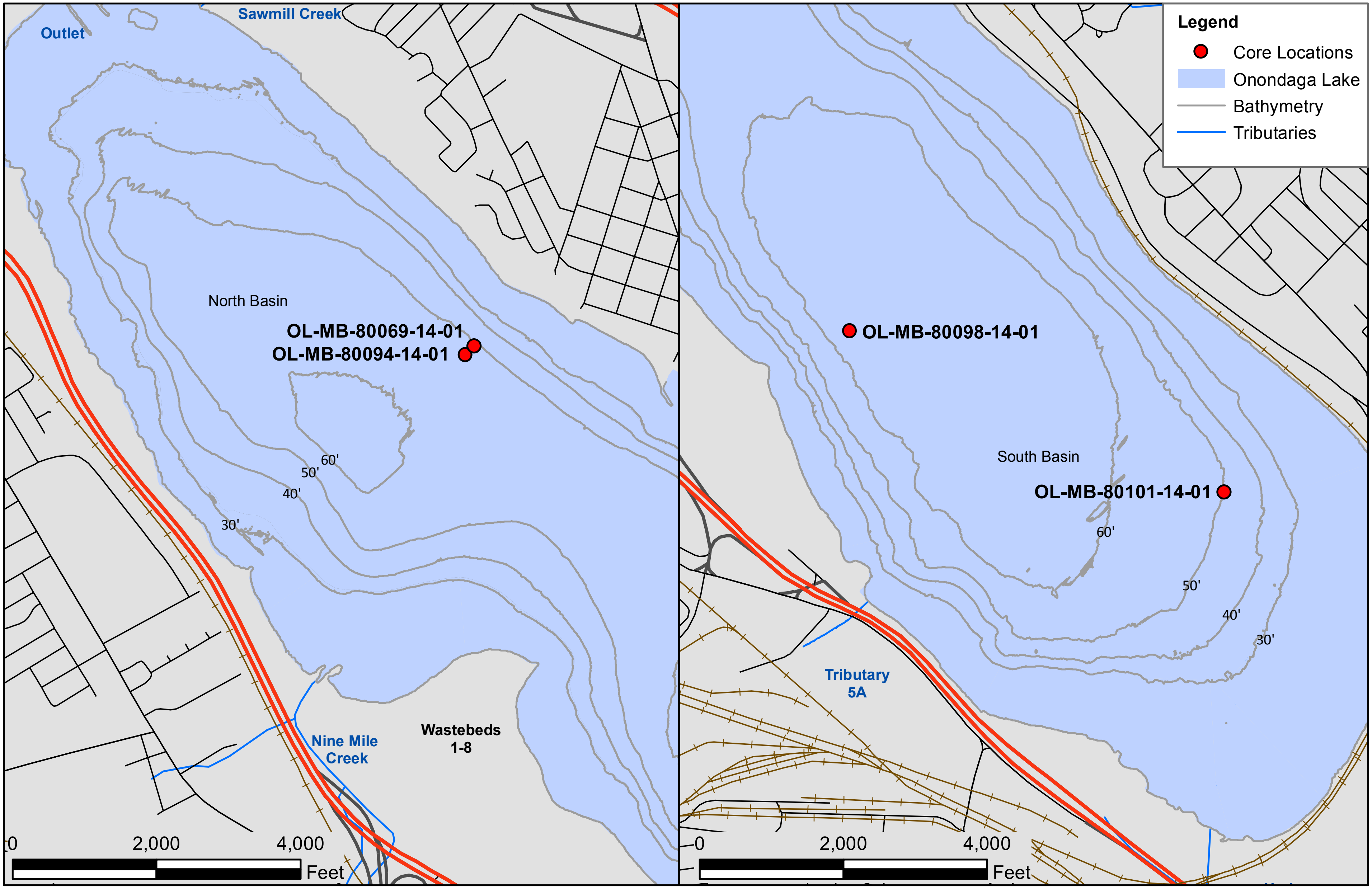
Sediment cores were collected in SMU 8 on October 22, 2014, in a manner consistent with the methods used to collect cores for microbead and/or banding[1] observations in 2010

[1] Banding refers to discrete layers or laminations in the sediment cores that are differentiated by color, consistency, or other visually observable characteristics.

(Parsons 2010), 2011 (Anchor QEA 2012a), and 2012 (Anchor QEA 2012b, 2012c) from SMU 8. The 2014 cores were placed vertically into a cooler, packed with wet ice for transport, and maintained in a frozen state for splitting. Visual observations were conducted on October 31, 2014.

Figure A-1 shows the locations where the four cores were collected in October 2014: two cores were collected from the eastern portion of SMU 8 in the North Basin, and two cores were collected from the South Basin portion of SMU 8.

Each of the four cores was vertically split open using a reciprocating saw to expose a vertical cross-section of the core, which was visually inspected for sediment layering (also called varves or banding). Each core was cut from the surface to the bottom of the core. Photographs were taken, and observations were recorded for each core. The vertical cross-section of each core was observed for evidence of the sand microbead marker. An ultraviolet light was used to assist with the visual inspection of the cores for evidence of microbead marker. In addition to recording observations of the microbead marker material in these cores, observations of sediment banding were recorded. Dave Babcock and Matthew Vetter of Parsons, Deirdre Reidy and Jim Ryan of Anchor QEA, and Bob Montione of AECOM were in attendance when the frozen cores were sliced on October 31, 2014. Visual observations of each of the sliced cores are summarized below.



\\helios\D_Drive\Projects\Honeywell\Onondaga_Lake_Remediation(090139-01)\SMU8\GIS\mxds\OL_SMU8_frozen_cores_2014_microbead.mxd mkeskin 8/3/2015 4:40:48 PM

Figure A-1
2014 Frozen Core Locations
Visual Inspection of the Onondaga Lake Frozen Cores Collected in October 2014 in Sediment Management Unit (SMU) 8
Honeywell-Parsons/Onondaga Lake

ANCHOR QEA Honeywell PARSONS

RESULTS

OL-MB-80094-14-01 (North Basin)

Core OL-MB-80094-14-01 was collected in the North Basin from a water depth of 54 feet (Figure A-1). Figure A-2 is a photo of Core OL-MB-80094-14-01 soon after being sliced vertically along a center section of the core.

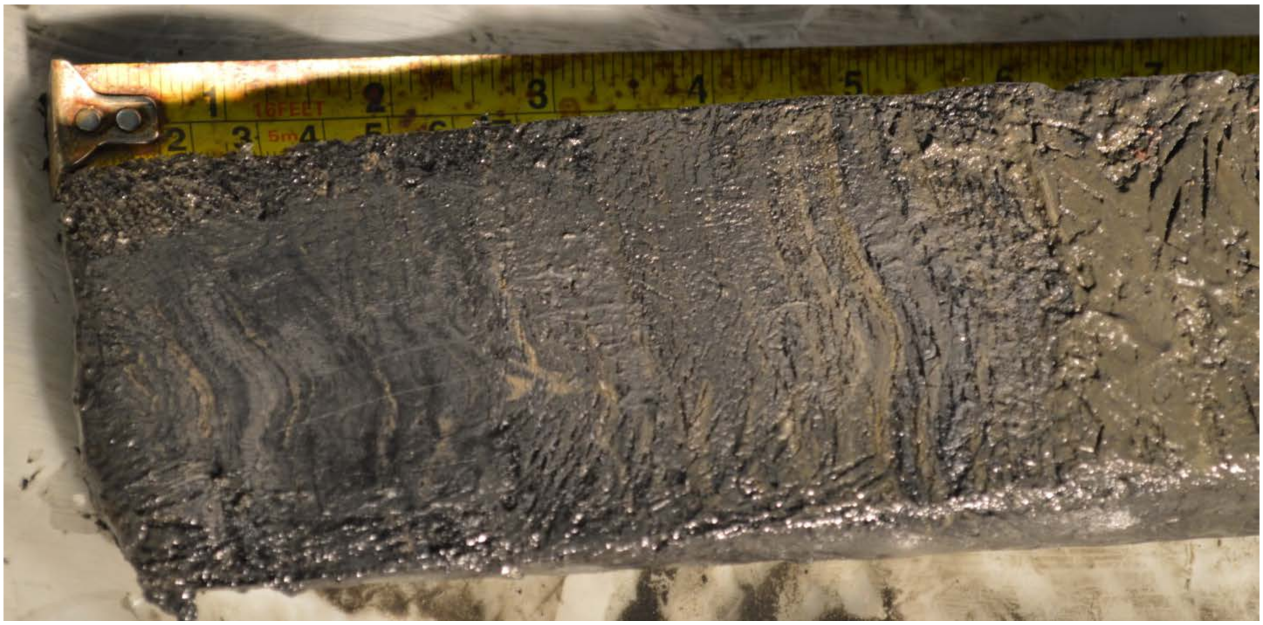


Figure A-2
Core OL-MB-80094-14-01 – Vertical Cross Section Showing Presence of Banding

The total recovered depth of the core was 66 cm. Visual inspection of the core OL-MB-80094-14-01 focused on the upper portion of the core where observations are representative of more recent lake sedimentation conditions. The observations of the vertical cross-section of the core indicated banding starting at a depth of 0.5 cm. The core color varied between black to dark brown/gray in color, depending on the depth and banding present. Observed bands appeared to be primarily composed of fine grained sediments (e.g., silts and clays). Descriptions of the banding are as follows:

- Black fine-grained sediment was observed from the surface to a depth of 0.5 cm, where a thin brown lamination (1 millimeter [mm]) was observed.
- Black sediment with fine brown laminations was observed from 0.6 cm to a depth of 2 cm.

- Black band (0.5 cm thick) observed at 2 cm.
- Dark gray band (0.5 cm thick) observed at a depth of 2.5 cm, with few black fine laminations within.
- Black band (1 cm thick) observed at 3 cm.
- Thin brown band (1 mm thick) observed at a depth of 4 cm.
- Dark gray sediment (1.9 cm thick) with brown mottling observed from a depth of 4.1 cm.
- Thin brown band (1 mm thick) observed at a depth of 6 cm.
- Dark gray sediment observed from 6.1 cm to 8 cm.
- Dark brown/gray band (0.25 cm thick) observed at a depth of 8 cm.
- Dark gray/black band (1 cm thick) observed at a depth of 8.25 cm.
- Alternating bands of dark brown (0.25 cm thick) to gray/black (0.25 cm thick) from a depth of 9.25 cm to 11.5 cm.

OL-MB-80069-14-01 (North Basin)

Core OL-MB-80069-14-01 was collected in the North Basin from a water depth of 51 feet at a location approximately 300 feet laterally from Core OL-MB-80094-14-01 (Figure 1). Prior to slicing the frozen core vertically, green microbead marker material was observed through the lexan core tube (Figure A-3).

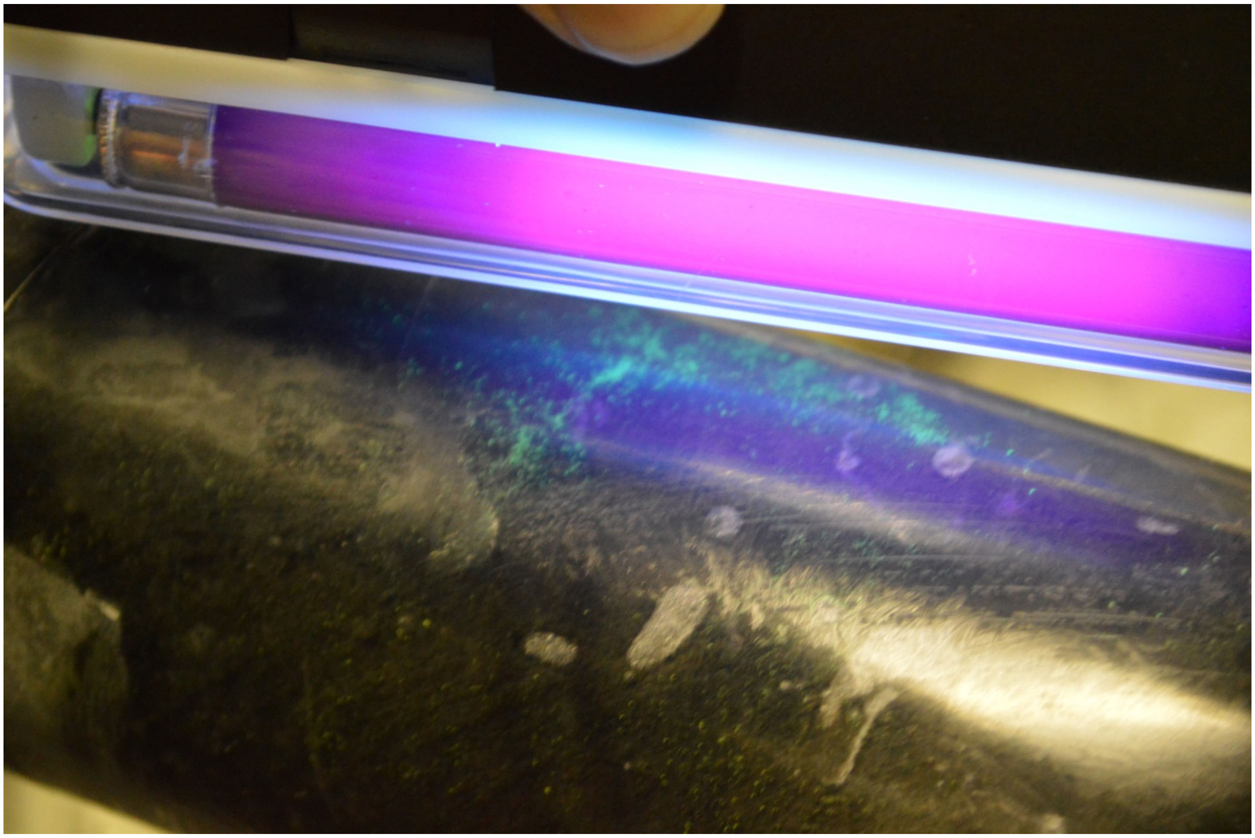


Figure A-3
Core OL-MB-80069-14-01 – Outside of the Core Showing Presence of Microbead Marker (UV Light Shining on Microbead Marker Material)

Once the core was sliced open, visual inspection of the vertical cross-section revealed a distinct green marker at a depth of 7 cm from the surface of the core, with some microbead marker material found throughout (Figure A-4).

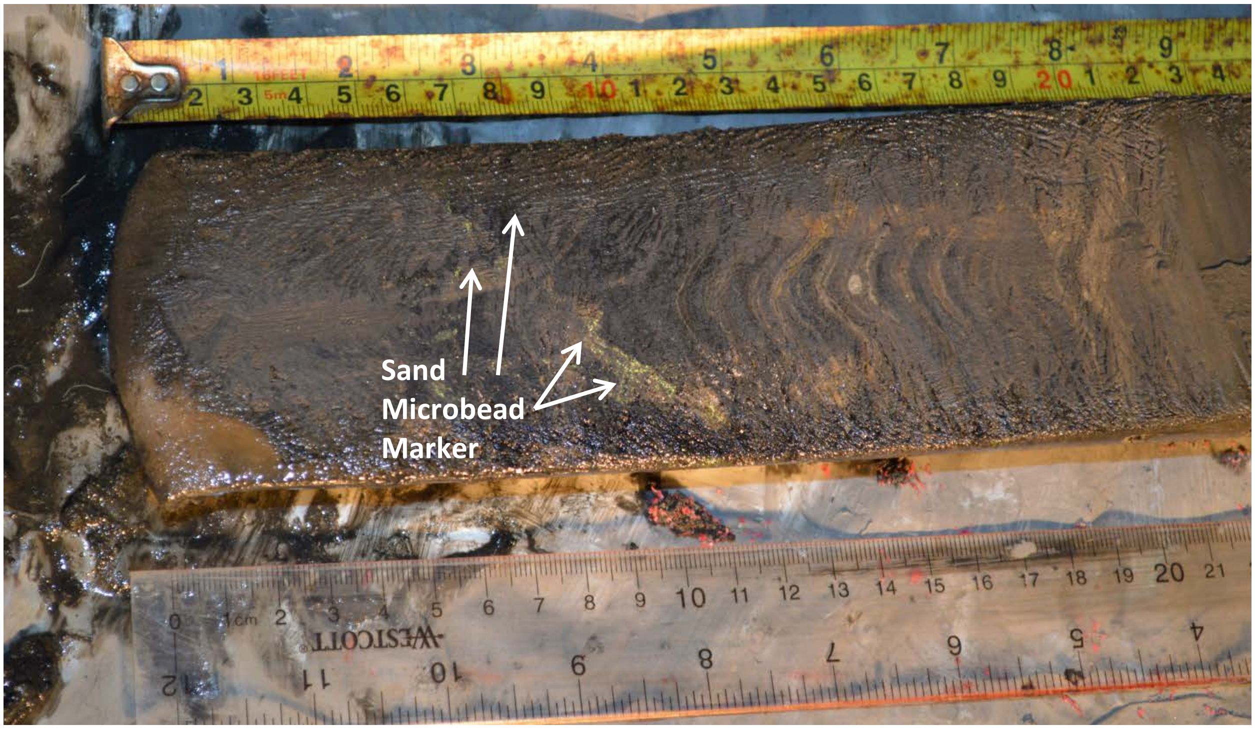


Figure A-4
Core OL-MB-80069-14-01 – Vertical Cross-section Showing Presence of Microbead Marker Banding

The total recovered depth of the core was 86 cm. Visual inspection of the core OL-MB-80069-14-01 (Figure 4) focused on the upper portion of the core where observations would be representative of more recent lake sedimentation conditions. The observations of the vertical cross-section of the core indicated banding starting at a depth of 7 cm, where the microbead marker was observed. The core color varied between dark brown to gray in color depending on the depth and banding present. Observed bands appeared to be primarily composed of fine grained sediments (e.g., silts and clays). Descriptions of the banding are as follows:

- Dark gray fine-grained sediment observed from the surface to a depth 7 cm, with microbead marker material interspersed within.
- Brown band (0.25 cm thick) with a layer of microbead marker material observed at a depth of 7 cm.
- Dark gray band (2 cm thick) observed at a depth of 7.25 cm.

- Alternating bands of light gray (0.25 cm thick) to dark gray (0.25 cm thick) observed from 9.25 cm to 11 cm.
- Alternating bands of tan (0.2 cm thick) to black (0.2 cm thick) observed from 11 cm to 17 cm.

OL-MB-80098-14-01 (South Basin)

Core OL-MB-80098-14-01 was collected in the South Basin, offshore from Wastebeds 1-8, where water depth was 62 feet (Figure A-1). No microbead marker material was observed in the core collected from this location (Figure A-5).

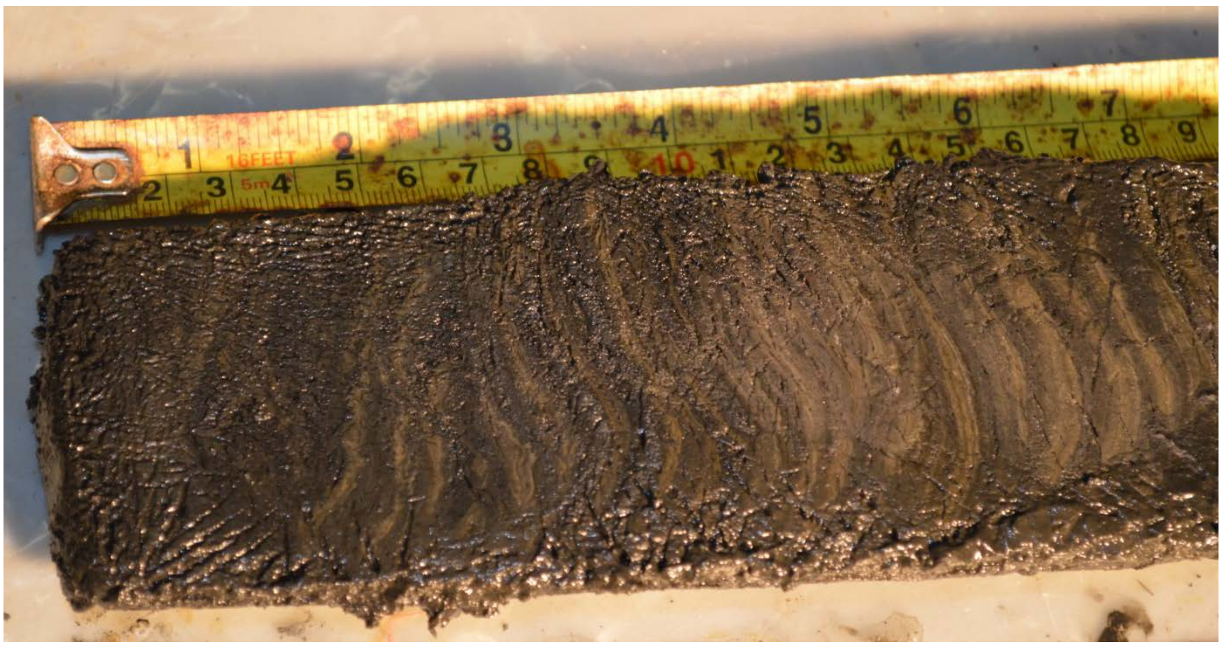


Figure A-5
Core OL-MB-80098-14-01 – Vertical Cross Section Showing Presence of Banding

The total recovered depth of the core was 60 cm. Visual inspection of the core OL-MB-80098-14-01 (Figure A-5) focused on the upper portion of the core where observations are representative of more recent lake sedimentation conditions. The observations indicated banding beginning at 1.75 cm from the top of the core. The core color varied between bands and included black, gray, and brown, with all bands appearing to be primarily composed of fine grained sediments (e.g., silts and clays). Descriptions of the banding are as follows:

- Very Black fine-grained sediment at surface to the depth of the 1.75 cm.
- Very dark gray slanted band observed from 1.75 to 2 cm.
- Very black band (1 cm thick) observed at 2 cm.
- Dark gray slanted band (0.5 cm thick) observed at a depth of 3 cm.
- Black band (1 cm thick) observed at 3.5 cm.
- Dark brown band (0.25 cm thick) observed at 4.5 cm.
- Black band (0.5 cm thick) observed at 4.75 cm.
- Dark brown band (0.25 cm thick) observed at 5.25 cm.
- Black band (0.5 cm thick) observed at 5.5 cm.
- Dark brown band (0.25 cm thick) observed at 6 cm.
- Black band (0.25 cm thick) observed at 6.25 cm.
- Dark brown band (0.25 cm thick) observed at 6.5 cm. Hairline laminations were observed within.
- Black band (0.25 cm thick) observed at 6.75 cm.
- Dark brown band (0.25 cm thick) observed at 7 cm.
- Black band (0.5 cm thick) observed at 7.25 cm.
- Dark brown band (0.25 cm thick) observed at 7.75 cm.
- Black band (0.5 cm thick) observed at 8 cm.
- Brown band (0.25 cm thick) observed at 8.5 cm.
- Black band (0.25 cm thick) observed at 8.75 cm.
- Brown band (2 mm thick) observed at 9 cm.
- Black band (0.5 cm thick) observed at 9.2 cm.
- A brown double-band (3 mm thick), with light edges observed at a depth of 9.7 cm.
- Black band (0.5 cm thick) observed at 10 cm.
- Dark brown band (0.25 cm thick) observed at 10.5 cm.
- Black band (0.25 cm thick) observed at 10.75 cm.
- Alternating bands of dark brown/gray (0.5 cm thick) to black (0.5 cm thick) observed to a depth of 19 cm.

OL-MB-80101-14-01 (South Basin)

Core OL-MB-80101-14-01 was collected in the South Basin from a water depth of 49 feet. No microbead marker material was observed in the core collected from this location (Figure A-6).

Figure A-6
Core OL-MB-80101-14-01 – Vertical Cross Section Showing Presence of Banding

The total recovered depth of the core was 84 cm. Visual inspection of the core OL-MB-80101-14-01 (Figure A-6) focused on the upper portion of the core where observations are representative of more recent lake sedimentation conditions. The observations of the vertical cross-section of the core indicated banding starting at a depth of 1 cm. The core color varied between black to dark brown to gray depending on the depth and banding present. All bands appeared to be primarily composed of fine grained sediments (e.g., silts and clays). Descriptions of the banding are as follows:

- Dark brown fine-grained sediment observed at surface to a depth of 1 cm.
- Dark gray band (0.5 cm thick) observed at a depth of 1 cm.
- Brown sediment (0.5 cm thick) observed at a depth of 1.5 cm.
- Dark gray band (1 cm thick) observed at a depth of 2 cm.
- Gray/brown band (1 cm thick) observed at a depth of 3 cm.
- Dark gray band (1.25 cm thick) observed at a depth of 4 cm.
- Gray/brown band (0.75 cm thick) observed at a depth of 5.25 cm.
- Dark gray band (2.5 cm thick) observed at 6 cm.
- Light gray band (0.5 cm thick) observed at a depth of 8.5 cm.

- Dark gray band (2 cm thick) observed at a depth of 9 cm.
- Brown band (1 cm thick) observed at a depth of 11 cm.
- Dark gray band (1 cm thick) observed at a depth of 12 cm.
- Light gray band (1 cm thick) observed at a depth of 13 cm.
- Dark gray band (1 cm thick) observed at a depth of 14 cm.

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Anchor QEA, 2012b. Evaluation of Extent of Mixing in Shallow Profundal Surface Sediments of Onondaga Lake Based on Visual Inspection of June 2012 SMU 8 Cores. July 23, 2012.

Anchor QEA, 2012c. Evaluation of the SMU 8 Sediment Processing Method Based on Visual Inspection of the Sand Microbead Marker Material in November 2012 SMU 8 Cores. November 2012

Parsons, 2010. *Evaluation of Onondaga Lake Profundal Surface Sediment Mixing Depths Based on Visual Evidence*. December 17, 2010.

Parsons and Environmental Tracing Systems, 2014. *Onondaga Lake Sediment Management Unit 8 Microbead Marker Placement Report*. Syracuse, New York. Prepared for Honeywell, Syracuse, New York. October 2014.

APPENDIX B

DESCRIPTIONS OF 2014 SMU 8 SURFACE SEDIMENT CORES

Surface sediment core descriptions are presented in this appendix in the order shown below (from north to south). Elevations are presented based on North American Vertical Datum (NAVD) 88.

North Basin

- OL-STA-80068
- OL-STA-80225
- OL-STA-80069
- OL-VC-80157

Ninemile Creek Outlet Area

- OL-STA-80226
- OL-STA-80227
- OL-STA-80073

Saddle

- OL-STA-80234
- OL-VC-80103
- OL-STA-80075

South Basin

- OL-STA-80076
- OL-STA-80078
- OL-STA-80229
- OL-STA-80080
- OL-STA-80082
- OL-STA-80084

South Corner

- OL-STA-80085
- OL-VC-80172
- OL-STA-80088
- OL- VC -80177

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-VC-80068-2014
Date: 10/22/2014
Weather: 56 deg, cloudy, winds NNW 5-15mph

Northing: 1131960.15
Easting: 914014.69
Mud Line: 312.63 Ft
Surface Water Depth: 50 Ft

Driller: PARSONS
Logging Company: PARSONS
Geologist: E Paccia/M Vetter
Penetration Depth: 2.5
Core Recovery Depth: 2.42

Water Elev: 362.63 Ft
Attempts: 1
Depth Units: ft

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2222-10		ML	Wet, very soft, dark brown, SILT.		
		OL-2222-11		ML	Wet, very soft, dark brown, SILT.		
0.328		OL-2222-12		ML	Wet, very soft, dark brown, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80225-2014
Date: 10/22/2014
Weather: 56 deg, cloudy, winds NNW 5-15mph

Northing: 1131817.283	Driller: PARSONS	Water Elev: 362.63 Ft
Easting: 912400.71	Logging Company: PARSONS	Attempts: 1
Mud Line: 310.63 Ft	Geologist: E Paccia/M Vetter	Depth Units: ft
Surface Water Depth: 52 Ft	Penetration Depth: 2 Core Recovery Depth: 2	

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2222-07		ML	Wet, very soft, dark brown, SILT.		
		OL-2222-08		ML	Wet, very soft, dark brown, SILT.		
0.328		OL-2222-09		ML	Wet, very soft, gray with black mottling, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80069-2014
Date: 10/22/2014
Weather: 56 deg, cloudy, winds NNW 5-15mph

Northing: 1130477.281	Driller: PARSONS	Water Elev: 362.63 Ft
Easting: 916894.786	Logging Company: PARSONS	Attempts: 1
Mud Line: 311.63 Ft	Geologist: E Paccia/M Vetter	Depth Units: ft
Surface Water Depth: 51 Ft	Penetration Depth: 2.5 Core Recovery Depth: 2.5	

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2222-04		ML	Wet, very soft, dark brown, SILT, with microbeads.		
		OL-2222-05		ML	Wet, very soft, dark brown, SILT, with microbeads on top layer.		
		OL-2222-06		ML	Wet, very soft, dark brown, SILT.		
0.328							

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-VC-80157-2014
Date: 10/22/2014
Weather: 56 deg, cloudy, winds NNW 5-15mph

Northing: 1130031.572
Easting: 914167.391
Mud Line: 303.63 Ft
Surface Water Depth: 59 Ft

Driller: PARSONS
Logging Company: PARSONS
Geologist: E Paccia/M Vetter
Penetration Depth: 3
Core Recovery Depth: 2.67

Water Elev: 362.63 Ft
Attempts: 1
Depth Units: ft

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2222-01		ML	Wet, very soft, brown and dark brown, SILT, leaves.		
		OL-2222-02		ML	Wet, very soft, dark brown, SILT.		
0.328		OL-2222-03		ML	Wet, very soft, dark brown, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80226-2014
Date: 10/22/2014
Weather: 56 deg, cloudy, winds NNW 5-15mph

Northing: 1128246.308
Easting: 914594.132
Mud Line: 322.63 Ft
Surface Water Depth: 40 Ft

Driller: PARSONS
Logging Company: PARSONS
Geologist: E Paccia/M Vetter
Penetration Depth: 2.5 Core Recovery Depth: 2.17

Water Elev: 362.63 Ft
Attempts: 1
Depth Units: ft

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2223-04		ML	Wet, very soft, brown on top with dark brown on bottom, SILT.		
		OL-2223-05		ML	Wet, very soft, dark brown, SILT.		
0.328		OL-2223-06		ML	Wet, very soft, brown with dark brown mottling, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80227-2014
Date: 10/22/2014
Weather: 56 deg, cloudy, winds NNW 5-15mph

Northing: 1128131.858	Driller: PARSONS	Water Elev: 362.63 Ft
Easting: 914928.175	Logging Company: PARSONS	Attempts: 1
Mud Line: 314.63 Ft	Geologist: E Paccia/M Vetter	Depth Units: ft
Surface Water Depth: 48 Ft	Penetration Depth: 2.5 Core Recovery Depth: 2.21	

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2223-07		ML	Wet, very soft, dark brown, SILT.		
		OL-2223-08		ML	Wet, very soft, dark brown, SILT.		
0.328		OL-2223-09		ML	Wet, very soft, brown with dark brown mottling, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80073-2014
Date: 10/22/2014
Weather: 56 deg, cloudy, winds NNW 5-15mph

Northing: 1127851.133
Easting: 915614.507
Mud Line: 311.63 Ft
Surface Water Depth: 51 Ft

Driller: PARSONS
Logging Company: PARSONS
Geologist: E Paccia/M Vetter
Penetration Depth: 2
Core Recovery Depth: 2

Water Elev: 362.63 Ft
Attempts: 1
Depth Units: ft

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2223-01		ML	Wet, very soft, dark brown, SILT.		
		OL-2223-02		ML	Wet, very soft, brown and dark brown, SILT, vegetation.		
0.328		OL-2223-03		ML	Wet, very soft, brown with dark brown mottling, SILT, with trace microbeads.		

BORING LOG	Page 1 of 1
Honeywell	

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80234-2014
Date: 10/22/2014
Weather: 56 deg, cloudy, winds NNW 5-15mph

Northing: 1128960.696	Driller: PARSONS	Water Elev: 362.63 Ft
Easting: 918727.627	Logging Company: PARSONS	Attempts: 1
Mud Line: 308.63 Ft	Geologist: E Paccia/M Vetter	Depth Units: ft
Surface Water Depth: 54 Ft	Penetration Depth: 3 Core Recovery Depth: 3	

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2223-16		ML	Wet, very soft, dark brown, SILT.		
		OL-2223-17		ML	Wet, very soft, dark brown, SILT.		
0.328		OL-2223-18		ML	Wet, very soft, dark brown, SILT.		

BORING LOG	Page 1 of 1	Site: Onondaga Lake (Syracuse NY) Boring No: OL-STA-80103-2014 Date: 10/20/2014 Weather: 56 deg, cloudy, winds SSW 10-20mph

Honeywell

Northing: 1127751.053 Easting: 918766.737 Mud Line: 307.89 Ft Surface Water Depth: 55 Ft	Driller: PARSONS Logging Company: PARSONS Geologist: E Paccia/M Vetter Penetration Depth: 2.5 Core Recovery Depth: 2.25	Water Elev: 362.89 Ft Attempts: 1 Depth Units: ft

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2223-13		ML	Wet, very soft, brown, SILT.		
		OL-2223-14		ML	Wet, very soft, brown and black, SILT.		
0.328		OL-2223-15		ML	Wet, very soft, brown and black, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80075-2014
Date: 10/20/2014
Weather: 56 deg, cloudy, SSW 10-20mph

Northing: 1127258.776
Easting: 918764.31
Mud Line: 309.89 Ft
Surface Water Depth: 53 Ft

Driller: PARSONS
Logging Company: PARSONS
Geologist: E Paccia/M Vetter
Penetration Depth: 2
Core Recovery Depth: 1.92

Water Elev: 362.89 Ft
Attempts: 1
Depth Units: ft

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2223-10		ML	Wet, very soft, brown, SILT.		
		OL-2223-11		ML	Wet, very soft, brown, SILT.		
0.328		OL-2223-12		ML	Wet, very soft, brown, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80076-2014
Date: 10/20/2014
Weather: 56 deg, cloudy, winds SSW 10-20mph

Northing: 1126092.994	Driller: PARSONS	Water Elev: 362.89 Ft
Easting: 920194.324	Logging Company: PARSONS	Attempts: 1
Mud Line: 302.89 Ft	Geologist: E Paccia/M Vetter	Depth Units: ft
Surface Water Depth: 60 Ft	Penetration Depth: 2.5 Core Recovery Depth: 2.25	

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2224-01		ML	Wet, very soft, brown, SILT.		
		OL-2224-02		ML	Wet, very soft, brown and black, SILT.		
0.328		OL-2224-03		ML	Wet, very soft, brown and black, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80078-2014
Date: 10/20/2014
Weather: 56 deg, cloudy, winds SSW 10-20mph

Northing: 1124584.054
Easting: 921423.813
Mud Line: 298.89 Ft
Surface Water Depth: 64 Ft

Driller: PARSONS
Logging Company: PARSONS
Geologist: E Paccia/M Vetter
Penetration Depth: 3
Core Recovery Depth: 2.83

Water Elev: 362.89 Ft
Attempts: 1
Depth Units: ft

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2224-07		ML	Wet, very soft, brown, SILT.		
		OL-2224-08		ML	Wet, very soft, dark brown, SILT.		
0.328		OL-2224-09		ML	Wet, very soft, brown and black, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80229-2014
Date: 10/22/2014
Weather: 56 deg, cloudy, winds NNW 5-15mph

Northing: 1124300.709 Easting: 919843.483 Mud Line: 304.63 Ft Surface Water Depth: 58 Ft	Driller: PARSONS Logging Company: PARSONS Geologist: E Paccia/M Vetter Penetration Depth: 3.5 Core Recovery Depth: 3.5	Water Elev: 362.63 Ft Attempts: 1 Depth Units: ft

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2224-04		ML	Wet, very soft, dark brown, SILT.		
		OL-2224-05		ML	Wet, very soft, dark brown, SILT.		
0.328		OL-2224-06		ML	Wet, very soft, dark brown and black, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80080-2014
Date: 10/20/2014
Weather: 56 deg, cloudy, winds SSW 10-20mph

Northing: 1123750.453	Driller: PARSONS	Water Elev: 362.89 Ft
Easting: 923744	Logging Company: PARSONS	Attempts: 1
Mud Line: 300.89 Ft	Geologist: E Paccia/M Vetter	Depth Units: ft
Surface Water Depth: 62 Ft	Penetration Depth: 2.5 Core Recovery Depth: 2.46	

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2224-10		ML	Wet, very soft, black, SILT.		
		OL-2224-11		ML	Wet, very soft, black, SILT, microbeads in bottom layer.		
0.328		OL-2224-12		ML	Wet, very soft, black, SILT, microbeads in top layer.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80082-2014
Date: 10/22/2014
Weather: 56 deg, cloudy, winds NNW 5-15mph

Northing: 1122148.299	Driller: PARSONS	Water Elev: 362.63 Ft
Easting: 921462.665	Logging Company: PARSONS	Attempts: 1
Mud Line: 303.63 Ft	Geologist: E Paccia/M Vetter	Depth Units: ft
Surface Water Depth: 59 Ft	Penetration Depth: 3 Core Recovery Depth: 2.83	

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2224-13		ML	Wet, very soft, dark brown, SILT.		
		OL-2224-14		ML	Wet, very soft, dark brown, SILT.		
0.328		OL-2224-15		ML	Wet, very soft, dark brown, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80084-2014
Date: 10/20/2014
Weather: 56 deg, cloudy, winds SSW 10-20mph

Northing: 1121960.108	Driller: PARSONS	Water Elev: 362.89 Ft
Easting: 923870.988	Logging Company: PARSONS	Attempts: 1
Mud Line: 299.89 Ft	Geologist: E Paccia/M Vetter	Depth Units: ft
Surface Water Depth: 63 Ft	Penetration Depth: 2.5 Core Recovery Depth: 2.25	

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2224-16		ML	Wet, very soft, brown, SILT.		
		OL-2224-17		ML	Wet, very soft, brown, SILT.		
0.328		OL-2224-18		ML	Wet, very soft, brown and black, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80085-2014
Date: 10/20/2014
Weather: 56 deg, cloudy, winds SSW 10-20mph

Northing: 1121766.871 Easting: 926312.738 Mud Line: 320.89 Ft Surface Water Depth: 42 Ft	Driller: PARSONS Logging Company: PARSONS Geologist: E Paccia/M Vetter Penetration Depth: 3 Core Recovery Depth: 2.83	Water Elev: 362.89 Ft Attempts: 1 Depth Units: ft

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2225-01		ML	Wet, very soft, brown, SILT.		
		OL-2225-02		ML	Wet, very soft, dark brown, SILT.		
0.328		OL-2225-03		ML	Wet, very soft, dark brown, SILT.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-VC-80172-2014
Date: 10/20/2014
Weather: 56 deg, cloudy, winds SSW 10-20mph

Northing: 1120972.454	Driller: PARSONS	Water Elev: 362.89 Ft
Easting: 925571.66	Logging Company: PARSONS	Attempts: 1
Mud Line: 306.89 Ft	Geologist: E Paccia/M Vetter	Depth Units: ft
Surface Water Depth: 56 Ft	Penetration Depth: 3 Core Recovery Depth: 2.71	

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2225-04		ML	Wet, very soft, brown, SILT.		
		OL-2225-05		ML	Wet, very soft, brown, SILT.		
0.328		OL-2225-06		ML	Wet, very soft, brown, SILT, vegetation at the bottom.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-STA-80088-2014
Date: 10/20/2014
Weather: 56 deg, cloudy, winds SSW 10-20mph

Northing: 1120386.089 Easting: 922642.073 Mud Line: 302.89 Ft Surface Water Depth: 60 Ft	Driller: PARSONS Logging Company: PARSONS Geologist: E Paccia/M Vetter Penetration Depth: 3 Core Recovery Depth: 2.92	Water Elev: 362.89 Ft Attempts: 1 Depth Units: ft

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2225-10		ML	Wet, very soft, brown and black, SILT.		
		OL-2225-11		ML	Wet, very soft, black, SILT, microbeads in bottom layer.		
0.328		OL-2225-12		ML	Wet, very soft, black, SILT, microbeads in top layer.		

BORING LOG

Honeywell

Site: Onondaga Lake (Syracuse NY)
Boring No: OL-VC-80177-2014
Date: 10/20/2014
Weather: 56 deg, cloudy, winds SSW 10-20mph

Northing: 1120174.935	Driller: PARSONS	Water Elev: 362.89 Ft
Easting: 924690.497	Logging Company: PARSONS	Attempts: 1
Mud Line: 303.89 Ft	Geologist: E Paccia/M Vetter	Depth Units: ft
Surface Water Depth: 59 Ft	Penetration Depth: 3 Core Recovery Depth: 3	

Depth ft	Recov	Sample ID	PID	USCS Code	Soil Description	Sample Method	Stratum
0		OL-2225-07		ML	Wet, very soft, brown, SILT.		
		OL-2225-08		ML	Wet, very soft, brown, SILT.		
0.328		OL-2225-09		ML	Wet, very soft, brown, SILT.		

APPENDIX C

DATA USABILITY SUMMARY REPORT FOR 2014 SMU 8 SEDIMENT AND SEDIMENT TRAP SLURRY SAMPLES

APPENDIX C:

DATA USABILITY SUMMARY REPORT

ONONDAGA LAKE
2014 MONITORED NATURAL RECOVERY

Prepared For:

Honeywell

Prepared By:

PARSONS

301 Plainfield Road, Suite 350
Syracuse, New York 13212
Phone: (315) 451-9560
Fax: (315) 451-9570

FEBRUARY 2015

TABLE OF CONTENTS

LIST OF ATTACHMENTS

SECTION C1

DATA USABILITY SUMMARY

Sediment core and sediment trap samples were collected as part of the Monitored Natural Recovery efforts at Onondaga Lake from May 20, 2014 through November 17, 2014. Analytical results from these samples were validated and reviewed by Parsons for usability with respect to the following requirements:

- Onondaga Lake Natural Recovery Monitoring Work Plan for 2014-2015 (Parsons and Anchor QEA 2014);
- Quality Assurance Project Plan (QAPP) for Onondaga Lake Construction and Post-Construction Media Monitoring (Surface Water, Biota and Sediment) (Parsons. Anchor QEA and Upstate Freshwater Institute [UFI] 2012); and
- USEPA Region II Standard Operating Procedures (SOPs) for inorganic data review (see Section D2 for citations).

The analytical laboratories for this project were Accutest Laboratories and Upstate Freshwater Institute (UFI). These laboratories are certified by the State of New York to conduct laboratory analyses for this project through the National Environmental Laboratory Accreditation Conference (NELAC) and the New State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP).

C1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 15 to 24 days for the samples.

The data packages received from the laboratories were paginated, complete, and overall were of good quality. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report which is summarized by sample media in Section D2.

C1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, properly preserved, shipped under a chain-of-custody (COC) record, and received at the laboratories within one to four days of sampling. All samples were received intact and in good condition at the laboratories.

C1.3 LABORATORY ANALYTICAL METHODS

The sediment core samples were collected from the site and analyzed for mercury. Sediment trap samples were collected from the site and analyzed for low level mercury, total suspended solids (TSS), and total fixed solids (TFS). Summaries of deviations from the Work Plan, QAPP, or USEPA Region II SOPs concerning these laboratory analyses are presented in Subsections D1.3.1 through D1.3.2. The data qualifications resulting from the data validation review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed for each analytical method by media in Section D2. The laboratory data were reviewed and may be qualified with the following validation flags:

"U" - not detected at the value given

"UJ" - estimated and not detected at the value given

"J" - estimated at the value given

"J+" - estimated biased high at the value given

"J-" - estimated biased low at the value given

"N" - presumptive evidence at the value given

"R" - unusable value

The validated laboratory data were tabulated and are presented in Attachment A.

C1.3.1 Mercury Analysis

Sediment core samples were analyzed for mercury using the USEPA SW-846 7471B analytical method; and sediment trap samples were analyzed for low level mercury using the USEPA 1631E analytical method. Certain reported results for the mercury samples were qualified as estimated based upon field duplicate precision and percent solids content. The reported mercury analytical results were considered 100% complete (i.e., usable) for the data presented by Accutest. PARCC requirements were met.

C1.3.2 Other Sediment Trap Analyses

Sediment trap samples were also analyzed TSS and TFS using the SM2540D and SM2540E analytical methods, respectively. Certain reported results for these samples were qualified as estimated based upon holding times. The reported analytical results for these parameters were considered 100% complete (i.e., usable) for the data presented by UFI. PARCC requirements were met.

SECTION C2

DATA VALIDATION REPORT

C2.1 SEDIMENT CORE SAMPLES

Data review has been completed for data packages generated by Accutest containing results for sediment core samples collected from the site. The specific samples contained in these data packages, the analyses performed, and the validated laboratory data were tabulated and are presented in Attachment A-1. All of these samples were properly preserved, shipped under a COC record, and received intact by the analytical laboratory.

Data validation was performed for all samples in accordance with the project work plan and QAPP as well as the USEPA Region II SOP HW-2c, Revision 15 “Mercury and Cyanide Data Validation”. This data validation and usability report is presented by analysis type.

C2.1.1 Mercury

The following items were reviewed for compliancy in the mercury analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration verifications
- Initial and continuing calibration, and laboratory preparation blank contamination
- Matrix spike / matrix spike duplicate (MS/MSD) recoveries
- Laboratory duplicate precision
- Laboratory control sample (LCS) recoveries
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of field duplicate precision as discussed below.

Field Duplicate Precision

All field duplicate precision results were considered acceptable with the exception of the precision of mercury for the field duplicate pairs OL-2222-03/-13 (70%RPD) and OL-2224-12/-19 (51%RPD). Therefore, the mercury results for these samples were considered estimated and qualified “J”.

Usability

All mercury sample results were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The mercury data presented by Accutest were 100% complete (i.e., usable). The validated mercury laboratory data are tabulated and presented in Attachment A-1.

It was noted that all sediment core samples contained less than 50% solids. Therefore, these results were considered estimated with positive results qualified “J” for the sediment core samples.

C2.2 SEDIMENT TRAP SAMPLES

Data review has been completed for data packages generated by Accutest and UFI containing results for sediment trap samples collected from the site. The specific samples contained in these data packages, the analyses performed, and the validated laboratory data were tabulated and are presented in Attachment A-2. All of these samples were properly preserved, shipped under a COC record, and received intact by the analytical laboratory.

Data validation was performed for all samples in accordance with the project work plan and QAPP as well as the USEPA Region II SOP HW-2c, Revision 15 “Mercury and Cyanide Data Validation”. This data validation and usability report is presented by analysis type.

C2.2.1 Low Level Mercury

The following items were reviewed for compliancy in the low level mercury analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration verifications
- Initial and continuing calibration, and laboratory preparation blank contamination
- Matrix spike / matrix spike duplicate (MS/MSD) recoveries

- Laboratory duplicate precision
- Laboratory control sample (LCS) recoveries
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of blank contamination.

Blank Contamination

The laboratory preparation blanks associated with all samples contained low level mercury below the reporting limit at concentrations of 0.15 and 0.18 ng/L. Validation qualification was not required since sample results were not affected by the trace level contamination in these blanks.

Usability

All low level mercury results for the sediment trap samples were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The low level mercury data presented by Accutest were 100% complete (i.e., usable). The validated low level mercury laboratory data are tabulated and presented in Attachment A-2.

C2.2.2 TSS and TFS

All custody documentation, holding times, matrix spike recoveries, laboratory duplicate precision, laboratory control sample recoveries, laboratory method blank contamination, initial and continuing calibration verifications, field duplicate precision, and quantitation limits were reviewed for compliance. Validation qualification of the sample results for these parameters was not required with the exception of the results for the TSS and TFS samples OL-2174-01, -02, and -03. These sample results were considered estimated and qualified “J” based upon a 7-day analytical holding time exceedance by one day.

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The data for these parameters presented by UFI were 100% complete (i.e., usable). The validated laboratory data are tabulated and presented in Attachment A-2.

ATTACHMENT A

VALIDATED LABORATORY DATA

ATTACHMENT A-1

VALIDATED LABORATORY DATA FOR SEDIMENT CORE SAMPLES

						Parameter	MERCURY		SOLIDS, PERCENT
						Units	mg/kg		%
Location ID	Field Sample ID	Sample Date	Sample Depth	Matrix	Samp Type	Filtered			
OL-STA-80069-2014	OL-2222-04	10/22/2014	0-0.06 FT	Soil	SED	N	0.61	J	24.3
OL-STA-80069-2014	OL-2222-05	10/22/2014	0.06-0.13 FT	Soil	SED	N	0.81	J	22.7
OL-STA-80069-2014	OL-2222-06	10/22/2014	0.13-0.32 FT	Soil	SED	N	1.2	J	28.5
OL-STA-80073-2014	OL-2223-01	10/22/2014	0-0.06 FT	Soil	SED	N	0.84	J	25.7
OL-STA-80073-2014	OL-2223-02	10/22/2014	0.06-0.13 FT	Soil	SED	N	0.9	J	26.2
OL-STA-80073-2014	OL-2223-03	10/22/2014	0.13-0.32 FT	Soil	SED	N	1.5	J	28.3
OL-STA-80075-2014	OL-2223-10	10/20/2014	0-0.06 FT	Soil	SED	N	0.68	J	26.2
OL-STA-80075-2014	OL-2223-11	10/20/2014	0.06-0.13 FT	Soil	SED	N	0.69	J	25.6
OL-STA-80075-2014	OL-2223-12	10/20/2014	0.13-0.32 FT	Soil	SED	N	1.2	J	24.8
OL-STA-80076-2014	OL-2224-01	10/20/2014	0-0.06 FT	Soil	SED	N	0.91	J	21.8
OL-STA-80076-2014	OL-2224-02	10/20/2014	0.06-0.13 FT	Soil	SED	N	0.95	J	18.3
OL-STA-80076-2014	OL-2224-03	10/20/2014	0.13-0.32 FT	Soil	SED	N	0.81	J	23.1
OL-STA-80078-2014	OL-2224-07	10/20/2014	0-0.06 FT	Soil	SED	N	1	J	24.5
OL-STA-80078-2014	OL-2224-08	10/20/2014	0.06-0.13 FT	Soil	SED	N	1	J	20.8
OL-STA-80078-2014	OL-2224-09	10/20/2014	0.13-0.32 FT	Soil	SED	N	1.7	J	25.6
OL-STA-80080-2014	OL-2224-10	10/20/2014	0-0.06 FT	Soil	SED	N	0.86	J	21.9
OL-STA-80080-2014	OL-2224-11	10/20/2014	0.06-0.13 FT	Soil	SED	N	0.74	J	24.2
OL-STA-80080-2014	OL-2224-12	10/20/2014	0.13-0.32 FT	Soil	SED	N	1.3	J	24
OL-STA-80080-2014	OL-2224-19	10/20/2014	0.13-0.32 FT	Soil	SED	N	2.2	J	14.5
OL-STA-80082-2014	OL-2224-13	10/22/2014	0-0.06 FT	Soil	SED	N	0.88	J	23.3
OL-STA-80082-2014	OL-2224-14	10/22/2014	0.06-0.13 FT	Soil	SED	N	1	J	20
OL-STA-80082-2014	OL-2224-15	10/22/2014	0.13-0.32 FT	Soil	SED	N	1.6	J	20.9
OL-STA-80084-2014	OL-2224-16	10/20/2014	0-0.06 FT	Soil	SED	N	1.1	J	28.8
OL-STA-80084-2014	OL-2224-17	10/20/2014	0.06-0.13 FT	Soil	SED	N	1.2	J	28.5
OL-STA-80084-2014	OL-2224-18	10/20/2014	0.13-0.32 FT	Soil	SED	N	1.1	J	35.5
OL-STA-80085-2014	OL-2225-01	10/20/2014	0-0.066 Ft	SOIL	SED	N	0.72	J	30.6
OL-STA-80085-2014	OL-2225-02	10/20/2014	0.066-0.131 Ft	SOIL	SED	N	1.8	J	18.4
OL-STA-80085-2014	OL-2225-03	10/20/2014	0.131-0.328 Ft	SOIL	SED	N	1.6	J	27.5
OL-STA-80088-2014	OL-2225-10	10/20/2014	0-0.066 Ft	SOIL	SED	N	1.2	J	25.8
OL-STA-80088-2014	OL-2225-11	10/20/2014	0.066-0.131 Ft	SOIL	SED	N	1.2	J	23.7
OL-STA-80088-2014	OL-2225-12	10/20/2014	0.131-0.328 Ft	SOIL	SED	N	1.5	J	19.4
OL-STA-80103-2014	OL-2223-13	10/20/2014	0-0.06 FT	Soil	SED	N	0.81	J	25.6
OL-STA-80103-2014	OL-2223-14	10/20/2014	0.06-0.13 FT	Soil	SED	N	1.1	J	24.4
OL-STA-80103-2014	OL-2223-15	10/20/2014	0.13-0.32 FT	Soil	SED	N	1.7	J	30.6
OL-STA-80103-2014	OL-2223-19	10/20/2014	0.13-0.32 FT	Soil	SED	N	2.2	J	23
OL-STA-80225-2014	OL-2222-07	10/22/2014	0-0.06 FT	Soil	SED	N	0.63	J	17
OL-STA-80225-2014	OL-2222-08	10/22/2014	0.06-0.13 FT	Soil	SED	N	0.66	J	18.2
OL-STA-80225-2014	OL-2222-09	10/22/2014	0.13-0.32 FT	Soil	SED	N	1.1	J	23.6
OL-STA-80226-2014	OL-2223-04	10/22/2014	0-0.06 FT	Soil	SED	N	0.67	J	29.1
OL-STA-80226-2014	OL-2223-05	10/22/2014	0.06-0.13 FT	Soil	SED	N	1.2	J	27.3
OL-STA-80226-2014	OL-2223-06	10/22/2014	0.13-0.32 FT	Soil	SED	N	1.5	J	26.4
OL-STA-80227-2014	OL-2223-07	10/22/2014	0-0.06 FT	Soil	SED	N	1.1	J	23.6
OL-STA-80227-2014	OL-2223-08	10/22/2014	0.06-0.13 FT	Soil	SED	N	1.3	J	27.5
OL-STA-80227-2014	OL-2223-09	10/22/2014	0.13-0.32 FT	Soil	SED	N	1.5	J	35.4
OL-STA-80229-2014	OL-2224-04	10/22/2014	0-0.06 FT	Soil	SED	N	0.73	J	22.8
OL-STA-80229-2014	OL-2224-05	10/22/2014	0.06-0.13 FT	Soil	SED	N	0.91	J	22.9
OL-STA-80229-2014	OL-2224-06	10/22/2014	0.13-0.32 FT	Soil	SED	N	1.3	J	25
OL-STA-80234-2014	OL-2223-16	10/22/2014	0-0.06 FT	Soil	SED	N	0.8	J	22.4
OL-STA-80234-2014	OL-2223-17	10/22/2014	0.06-0.13 FT	Soil	SED	N	0.57	J	40.6
OL-STA-80234-2014	OL-2223-18	10/22/2014	0.13-0.32 FT	Soil	SED	N	1.4	J	27.7
OL-VC-80068-2014	OL-2222-10	10/22/2014	0-0.06 FT	Soil	SED	N	0.7	J	18.4
OL-VC-80068-2014	OL-2222-11	10/22/2014	0.06-0.13 FT	Soil	SED	N	0.72	J	21.1
OL-VC-80068-2014	OL-2222-12	10/22/2014	0.13-0.32 FT	Soil	SED	N	1.4	J	23.5
OL-VC-80157-2014	OL-2222-01	10/22/2014	0-0.06 FT	Soil	SED	N	0.6	J	19.1
OL-VC-80157-2014	OL-2222-02	10/22/2014	0.06-0.13 FT	Soil	SED	N	0.71	J	18.2
OL-VC-80157-2014	OL-2222-03	10/22/2014	0.13-0.32 FT	Soil	SED	N	2	J	23.4
OL-VC-80157-2014	OL-2222-13	10/22/2014	0.13-0.32 FT	Soil	SED	N	0.96	J	26.2
OL-VC-80172-2014	OL-2225-04	10/20/2014	0-0.066 Ft	SOIL	SED	N	1.1	J	29.8
OL-VC-80172-2014	OL-2225-05	10/20/2014	0.066-0.131 Ft	SOIL	SED	N	1.3	J	29.4
OL-VC-80172-2014	OL-2225-06	10/20/2014	0.131-0.328 Ft	SOIL	SED	N	1.4	J	25.5
OL-VC-80172-2014	OL-2225-13	10/20/2014	0.131-0.328 Ft	SOIL	SED	N	2.2	J	25.3
OL-VC-80177-2014	OL-2225-07	10/20/2014	0-0.066 Ft	SOIL	SED	N	1	J	25.6
OL-VC-80177-2014	OL-2225-08	10/20/2014	0.066-0.131 Ft	SOIL	SED	N	1.5	J	29.4
OL-VC-80177-2014	OL-2225-09	10/20/2014	0.131-0.328 Ft	SOIL	SED	N	1.7	J	22.7

ATTACHMENT A-2

VALIDATED LABORATORY DATA FOR SEDIMENT TRAP SAMPLES

							Parameter	MERCURY		TOTAL FIXED SOLIDS (TFS)		Total Suspended Solids,(TSS)	
							Method	E1631		SM2540E		SM2540D	
							Filtered	N		N		N	
							Units	ug/l		mg/L		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type						
DEEP_S	OL-2102-01	33 - 33	05/20/2014	UFI CHM 2014-013	WATER	REG	SLURRY			6116		6952	
DEEP_S	OL-2102-02	33 - 33	05/20/2014	UFI CHM 2014-013	WATER	FD	SLURRY			5616		6408	
DEEP_S	OL-2102-03	33 - 33	05/20/2014	UFI CHM 2014-013	WATER	FD2	SLURRY			5788		6544	
DEEP_S	OL-2147-01	33 - 33	05/20/2014	1436008	WATER	REG	SLURRY	9.91					
DEEP_S	OL-2104-01	33 - 33	05/27/2014	UFI CHM 2014-018	WATER	REG	SLURRY			2876		3400.0	
DEEP_S	OL-2104-02	33 - 33	05/27/2014	UFI CHM 2014-018	WATER	FD	SLURRY			2932		3512.0	
DEEP_S	OL-2104-03	33 - 33	05/27/2014	UFI CHM 2014-018	WATER	FD2	SLURRY			3292		3916.0	
DEEP_S	OL-2105-01	33 - 33	06/02/2014	UFI CHM 2014-018	WATER	REG	SLURRY			2180		2700.0	
DEEP_S	OL-2105-02	33 - 33	06/02/2014	UFI CHM 2014-018	WATER	FD	SLURRY			2068		2552.0	
DEEP_S	OL-2105-03	33 - 33	06/02/2014	UFI CHM 2014-018	WATER	FD2	SLURRY			2384		2884.0	
DEEP_S	OL-2147-02	33 - 33	06/02/2014	1436008	WATER	REG	SLURRY	9.55					
DEEP_S	OL-2106-01	33 - 33	06/09/2014	UFI CHM 2014-018	WATER	REG	SLURRY			4300		4848.0	
DEEP_S	OL-2106-02	33 - 33	06/09/2014	UFI CHM 2014-018	WATER	FD	SLURRY			4424		4956.0	
DEEP_S	OL-2106-03	33 - 33	06/09/2014	UFI CHM 2014-018	WATER	FD2	SLURRY			4624		5224.0	
DEEP_S	OL-2109-01	33 - 33	06/16/2014	UFI CHM 2014-018	WATER	REG	SLURRY			2936		3380.0	
DEEP_S	OL-2109-02	33 - 33	06/16/2014	UFI CHM 2014-018	WATER	FD	SLURRY			2884		3344.0	
DEEP_S	OL-2109-03	33 - 33	06/16/2014	UFI CHM 2014-018	WATER	FD2	SLURRY			4360		5008.0	
DEEP_S	OL-2147-03	33 - 33	06/16/2014	1436008	WATER	REG	SLURRY	1.92					
DEEP_S	OL-2111-01	33 - 33	06/23/2014	UFI CHM 2014-022	WATER	REG	SLURRY			1768		2136	
DEEP_S	OL-2111-02	33 - 33	06/23/2014	UFI CHM 2014-022	WATER	FD	SLURRY			2248		2624	
DEEP_S	OL-2111-03	33 - 33	06/23/2014	UFI CHM 2014-022	WATER	FD2	SLURRY			1868		2244	
DEEP_S	OL-2114-01	33 - 33	06/30/2014	UFI CHM 2014-022	WATER	REG	SLURRY			2880		3216	
DEEP_S	OL-2114-02	33 - 33	06/30/2014	UFI CHM 2014-022	WATER	FD	SLURRY			2884		3272	
DEEP_S	OL-2114-03	33 - 33	06/30/2014	UFI CHM 2014-022	WATER	FD2	SLURRY			3008		3604	
DEEP_S	OL-2147-04	33 - 33	06/30/2014	1436008	WATER	REG	SLURRY	2.08					
DEEP_S	OL-2118-01	33 - 33	07/07/2014	UFI CHM 2014-023	WATER	REG	SLURRY			2876		3336	
DEEP_S	OL-2118-02	33 - 33	07/07/2014	UFI CHM 2014-023	WATER	FD	SLURRY			3216		3640	
DEEP_S	OL-2118-03	33 - 33	07/07/2014	UFI CHM 2014-023	WATER	FD2	SLURRY			3012		3468	
DEEP_S	OL-2122-01	33 - 33	07/14/2014	UFI CHM 2014-025	WATER	REG	SLURRY			3260.0		3772.0	
DEEP_S	OL-2122-02	33 - 33	07/14/2014	UFI CHM 2014-025	WATER	FD	SLURRY			3024.0		3440.0	
DEEP_S	OL-2122-03	33 - 33	07/14/2014	UFI CHM 2014-025	WATER	FD2	SLURRY			3668.0		4172.0	
DEEP_S	OL-2147-05	33 - 33	07/14/2014	1436008	WATER	REG	SLURRY	3.2					
DEEP_S	OL-2126-01	33 - 33	07/21/2014	UFI CHM 2014-027	WATER	REG	SLURRY			3056.0		3596.0	
DEEP_S	OL-2126-02	33 - 33	07/21/2014	UFI CHM 2014-027	WATER	FD	SLURRY			2804.0		3192.0	
DEEP_S	OL-2126-03	33 - 33	07/21/2014	UFI CHM 2014-027	WATER	FD2	SLURRY			3172.0		3668.0	
DEEP_S	OL-2129-01	33 - 33	07/28/2014	UFI CHM 2014-030	WATER	REG	SLURRY			3048.0		3440.0	
DEEP_S	OL-2129-02	33 - 33	07/28/2014	UFI CHM 2014-030	WATER	FD	SLURRY			3344.0		3760.0	
DEEP_S	OL-2129-03	33 - 33	07/28/2014	UFI CHM 2014-030	WATER	FD2	SLURRY			3892.0		4332.0	
DEEP_S	OL-2147-06	33 - 33	07/28/2014	1436008	WATER	REG	SLURRY	3.64					
DEEP_S	OL-2133-01	33 - 33	08/04/2014	UFI CHM 2014-032	WATER	REG	SLURRY			2080.0		2460.0	
DEEP_S	OL-2133-02	33 - 33	08/04/2014	UFI CHM 2014-032	WATER	FD	SLURRY			2280.0		2616.0	
DEEP_S	OL-2133-03	33 - 33	08/04/2014	UFI CHM 2014-032	WATER	FD2	SLURRY			2172.0		2500.0	
DEEP_S	OL-2136-01	33 - 33	08/11/2014	UFI CHM 2014-035	WATER	REG	SLURRY			4432.0		4952.0	

							Parameter	MERCURY		TOTAL FIXED SOLIDS (TFS)		Total Suspended Solids,(TSS)	
							Method	E1631		SM2540E		SM2540D	
							Filtered	N		N		N	
							Units	ug/l		mg/L		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type						
DEEP_S	OL-2136-02	33 - 33	08/11/2014	UFI CHM 2014-035	WATER	FD	SLURRY			3888.0		4412.0	
DEEP_S	OL-2136-03	33 - 33	08/11/2014	UFI CHM 2014-035	WATER	FD2	SLURRY			3788.0		4280.0	
DEEP_S	OL-2147-07	33 - 33	08/11/2014	1436008	WATER	REG	SLURRY	2.81					
DEEP_S	OL-2140-01	33 - 33	08/18/2014	UFI CHM 2014-037	WATER	REG	SLURRY			5248.0		5936.0	
DEEP_S	OL-2140-02	33 - 33	08/18/2014	UFI CHM 2014-037	WATER	FD	SLURRY			4652.0		5232.0	
DEEP_S	OL-2140-03	33 - 33	08/18/2014	UFI CHM 2014-037	WATER	FD2	SLURRY			5956.0		6720.0	
DEEP_S	OL-2144-01	33 - 33	08/25/2014	UFI CHM 2014-038	WATER	REG	SLURRY			3300.0		3860.0	
DEEP_S	OL-2144-02	33 - 33	08/25/2014	UFI CHM 2014-038	WATER	FD	SLURRY			3208.0		3720.0	
DEEP_S	OL-2144-03	33 - 33	08/25/2014	UFI CHM 2014-038	WATER	FD2	SLURRY			3924.0		4712.0	
DEEP_S	OL-2147-08	33 - 33	08/25/2014	1436008	WATER	REG	SLURRY	1.52					
DEEP_S	OL-2150-01	33 - 33	09/02/2014	UFI CHM 2014-043	WATER	REG	SLURRY			4028.0		4268.0	
DEEP_S	OL-2150-02	33 - 33	09/02/2014	UFI CHM 2014-043	WATER	FD	SLURRY			4204.0		4628.0	
DEEP_S	OL-2150-03	33 - 33	09/02/2014	UFI CHM 2014-043	WATER	FD2	SLURRY			4700.0		5144.0	
DEEP_S	OL-2192-01	33 - 33	09/02/2014	1447037	WATER	REG	SLURRY	2.45					
DEEP_S	OL-2154-01	33 - 33	09/09/2014	UFI CHM 2014-044	WATER	REG	SLURRY			2420.0		2852.0	
DEEP_S	OL-2154-02	33 - 33	09/09/2014	UFI CHM 2014-044	WATER	FD	SLURRY			2320.0		2760.0	
DEEP_S	OL-2154-03	33 - 33	09/09/2014	UFI CHM 2014-044	WATER	FD2	SLURRY			2376.0		2856.0	
DEEP_S	OL-2192-02	33 - 33	09/09/2014	1447037	WATER	REG	SLURRY	3.01					
DEEP_S	OL-2192-03	33 - 33	09/16/2014	1447037	WATER	REG	SLURRY	5.75					
DEEP_S	OL-2158-01	33 - 33	09/16/2014	UFI CHM 2014-045	WATER	REG	SLURRY			2884.0		3352.0	
DEEP_S	OL-2158-02	33 - 33	09/16/2014	UFI CHM 2014-045	WATER	FD	SLURRY			3532.0		4080.0	
DEEP_S	OL-2158-03	33 - 33	09/16/2014	UFI CHM 2014-045	WATER	FD2	SLURRY			3368.0		3912.0	
DEEP_S	OL-2192-04	33 - 33	09/24/2014	1447037	WATER	REG	SLURRY	4.6					
DEEP_S	OL-2162-01	33 - 33	09/25/2014	UFI CHM 2014-047	WATER	REG	SLURRY			3600.0		4156.0	
DEEP_S	OL-2162-02	33 - 33	09/25/2014	UFI CHM 2014-047	WATER	FD	SLURRY			4132.0		4752.0	
DEEP_S	OL-2162-03	33 - 33	09/25/2014	UFI CHM 2014-047	WATER	FD2	SLURRY			3972.0		4588.0	
DEEP_S	OL-2166-01	33 - 33	09/30/2014	UFI CHM 2014-048	WATER	REG	SLURRY			1564.0		1844.0	
DEEP_S	OL-2166-02	33 - 33	09/30/2014	UFI CHM 2014-048	WATER	FD	SLURRY			1672.0		1980.0	
DEEP_S	OL-2166-03	33 - 33	09/30/2014	UFI CHM 2014-048	WATER	FD2	SLURRY			1660.0		1972.0	
DEEP_S	OL-2192-05	33 - 33	09/30/2014	1447037	WATER	REG	SLURRY	1.87					
DEEP_S	OL-2170-01	33 - 33	10/07/2014	UFI CHM 2014-051	WATER	REG	SLURRY			2848.0		3244.0	
DEEP_S	OL-2170-02	33 - 33	10/07/2014	UFI CHM 2014-051	WATER	FD	SLURRY			2548.0		2872.0	
DEEP_S	OL-2170-03	33 - 33	10/07/2014	UFI CHM 2014-051	WATER	FD2	SLURRY			2924.0		3336.0	
DEEP_S	OL-2192-06	33 - 33	10/07/2014	1447037	WATER	REG	SLURRY	1.73					
DEEP_S	OL-2174-01	33 - 33	10/14/2014	UFI CHM 2014-053	WATER	REG	SLURRY			5476.0	J	6248.0	J
DEEP_S	OL-2174-02	33 - 33	10/14/2014	UFI CHM 2014-053	WATER	FD	SLURRY			4236.0	J	4404.0	J
DEEP_S	OL-2174-03	33 - 33	10/14/2014	UFI CHM 2014-053	WATER	FD2	SLURRY			5444.0	J	6236.0	J
DEEP_S	OL-2192-07	33 - 33	10/14/2014	1447037	WATER	REG	SLURRY	2.91					
DEEP_S	OL-2178-01	33 - 33	10/20/2014	UFI CHM 2014-055	WATER	REG	SLURRY			3500.0		3936.0	
DEEP_S	OL-2178-02	33 - 33	10/20/2014	UFI CHM 2014-055	WATER	FD	SLURRY			4220.0		4680.0	
DEEP_S	OL-2178-03	33 - 33	10/20/2014	UFI CHM 2014-055	WATER	FD2	SLURRY			4560.0		5148.0	
DEEP_S	OL-2192-08	33 - 33	10/20/2014	1447037	WATER	REG	SLURRY	2.38					
DEEP_S	OL-2182-01	33 - 33	10/27/2014	UFI CHM 2014-058	WATER	REG	SLURRY			4460.0		5260.0	

							Parameter	MERCURY		TOTAL FIXED SOLIDS (TFS)		Total Suspended Solids,(TSS)	
							Method	E1631		SM2540E		SM2540D	
							Filtered	N		N		N	
							Units	ug/l		mg/L		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type						
DEEP_S	OL-2182-02	33 - 33	10/27/2014	UFI CHM 2014-058	WATER	FD	SLURRY			8144.0		9036.0	
DEEP_S	OL-2182-03	33 - 33	10/27/2014	UFI CHM 2014-058	WATER	FD2	SLURRY			8748.0		9788.0	
DEEP_S	OL-2192-09	33 - 33	10/27/2014	1447037	WATER	REG	SLURRY	5.06					
DEEP_S	OL-2186-01	33 - 33	11/03/2014	UFI CHM 2014-062	WATER	REG	SLURRY			9728.0		10948.0	
DEEP_S	OL-2186-02	33 - 33	11/03/2014	UFI CHM 2014-062	WATER	FD	SLURRY			12440.0		13964.0	
DEEP_S	OL-2186-03	33 - 33	11/03/2014	UFI CHM 2014-062	WATER	FD2	SLURRY			9024.0		10072.0	
DEEP_S	OL-2192-10	33 - 33	11/03/2014	1447037	WATER	REG	SLURRY	6.24					
DEEP_S	OL-2190-01	33 - 33	11/17/2014	UFI CHM 2014-065	WATER	REG	SLURRY			12012.0		13316.0	
DEEP_S	OL-2190-02	33 - 33	11/17/2014	UFI CHM 2014-065	WATER	FD	SLURRY			10212.0		11336.0	
DEEP_S	OL-2190-03	33 - 33	11/17/2014	UFI CHM 2014-065	WATER	FD2	SLURRY			10928.0		12176.0	
DEEP_S	OL-2192-11	33 - 33	11/17/2014	1447037	WATER	REG	SLURRY	7.5					