Figure 10. 1889 Sweet map of Onondaga Lake and approximate APE of Wastebeds 1-8 survey.
Figure 11. 1898 15 minute Syracuse East USGS quadrangle, with approximate APE of Wastebeds 1-8 survey.
Figure 12. 1892 Sanborn map of Lake View Resort.
Figure 13. Allied Waste Beds around Onondaga Lake, with approximate APE of Wastebeds 1-8 Survey highlighted in red.
Figure 14. Ninemile Creek, former channel locations, and project area (in red).
V. PHASE 1B FIELD AND LABORATORY METHODOLOGY

5.1 Geomorphological Analysis

Following the Phase 1A survey, a geomorphological assessment was completed in January of 2010 (Aiuvalasit and Schuldenrein 2010; Appendix III, pp. 35-39) to determine if there were areas within the shoreline areas of impact of Wastebeds 1-8 with the potential to contain intact deposits and cultural material from the precontact and/or post-contact periods. In addition, a geomorphological assessment was completed in the field in October and November of 2010 (Urista, Aiuvalasit, and Schuldenrein 2011) for the area on the northern shoreline of Wastebeds 1-8 near the confluence of Ninemile Creek and Onondaga Lake. A geomorphological analysis of the boring logs provided a general characterization of the subsurface stratigraphy. Results of the soil boring analysis and additional geomorphological analysis are included in Appendix III, pp. 40-85. In addition, an analysis of soil borings for the remainder of the supplemental work on Wastebeds 1-8 was undertaken to provide a general stratigraphy as well a determination of archaeological work.

5.2 Project Walkover

A walkover of the project area by PAF personnel was conducted, in the fall of 2010 to determine how much of the APE would be accessible for subsurface testing, and to identify cultural remains that were visible above ground. The project area along the shoreline consists primarily of grasses and brush adjacent to Onondaga Lake (Photos 1-5). Wood pilings and bulkheads from the mid 20th century perimeter fences to hold the waste products in Wastebeds 1-8 are visible above the surface on the eastern shoreline (Photo 6 and Appendix VI, p. 96). No other resources were visible above the ground surface within the areas to be impacted for the shoreline work along Wastebeds 1-8. The proposed access roads/pathways are either a gravel road built up on top of Solvay Waste, on dirt pathways on top of Solvay Waste or in areas along the vegetated shoreline or in brush on top of Wastebeds 1-8. No postcontact resources are visible in the former biosolids area, within Ditch A, or in those areas where forcemains or collection trenches will be located.

5.3 Subsurface Testing Procedures

Based on the prior geomorphological analysis, the analysis of soil borings on the shoreline and to the west of the shoreline, as well as the project limits, PAF implemented the Phase 1B work to include additional geomorphological analysis on the northern shoreline discussed above in Section 5.1, as well as a series of shovel test pits (STPs) on the eastern shoreline. Although geomorphological analysis determined that precontact resources would not be present along the shoreline, the extension of the project to the west and the identification of some darker soil horizons away from the shoreline, as well as the potential for 19th to 20th century resources suggested that a series of STPs near the former Lakeview Point Resort, as well as away from the shoreline could be useful in affirming the geomorphological results. The STPs were initially laid in at 7.5 m (25 ft) intervals on a transect on the western edge of the project area to determine if intact soil horizons were located within the depths of planned impacts. Because of the depth of the Solvay waste and the lack of any intact soil horizons, STP excavation was stretched to 15 m (49 ft) in portions of the project area. An additional STP was excavated 2 meters east of STP SH7 due to a wood obstruction in SH 7. The depth of the planned remediation ranges from .3 to 1.2 m (1 to 4 ft), so STPs were excavated to approximately 1m (3.3 ft) or more in depth unless obstructed by compact soil horizons or water table.

The STPs were excavated with hand tools and were generally 35-50 cm (14-20 in) in diameter. A 1.8 m (6 ft) digging bar was used in a majority of the STPs in order to punch through the compact Solvay Waste. All soil was placed on a screen with 7 mm (0.25 in) hardware cloth and troweled through to search for any cultural material. Written descriptions of soil color and texture, artifact content, and digging conditions were made at the time of excavation. The STP soil records are presented in Appendix VII, pp. 97-98.
All field testing operations involved the use of modified level D personal protective equipment appropriate for this hazardous waste site, per OSHA standards. Personal protective equipment included Tyvek suits, outer and inner gloves, and rubber boots with a steel shank. Equipment removed from the field each day was decontaminated through the use of Alconox (a detergent) and water at the end of the day. All personnel completed 40 hour training and/or 8 hour refresher HAZWOPER training for work on hazardous waste sites. During the STP excavation and subsequent screening of samples from soil horizons, air monitoring was conducted by Parsons’ staff. The air monitoring was completed through the use of a MiniRAE 3000 Photoionization detector (PID) to check volatile organic compounds (VOC) with a range of 0 to 15,000 ppm and a Jerome 431-X meter to check for mercury. The Jerome 431-X meter allows the user to measure mercury levels from 0.003 to 0.999 mg/m³.

At the discretion of the Onondaga Nation, archaeological work was monitored by a representative of the Nation who had completed the required OSHA training for hazardous sites. The representatives of the Onondaga Nation included Tony Gonyea and Zena Hyde. Any minor deviations from the work plan were discussed with the Nation monitor and noted in writing to Parsons.

5.4 General Laboratory Methods

All of the notes and other documentation of the reconnaissance testing are curated according to federal (36 CFR Part 79) and state (NYAC 1994) guidelines in the facilities of the Department of Anthropology at Binghamton University.
Photo 2. Facing north, vegetation on shoreline of Wastebeds 1-8 Shoreline area, with built up deposits of Wastebeds 1-8 in background.

Photo 3. Facing southwest, vegetation of Wastebeds 1-8 Shoreline area, with built up deposits of Wastebeds 1-8 in background.
Photo 4. Facing north, Solvay waste on the surface in Wastebeds 1-8 Shoreline area.

Photo 5. Facing southeast, western edge of Wastebeds 1-8 Shoreline area.
VI. RECONNAISSANCE SURVEY RESULTS

6.1 Geomorphological Assessment Results

*North Shoreline of Wastebeds 1-8* - The initial geomorphological assessment of the shoreline of Wastebeds 1-8 based on postcontact period background research suggested that the original shoreline could potentially exist on the northern shoreline of Wastebeds 1-8. No soil borings had been completed for the shoreline prior to that determination (Aiuvalasit and Schuldenrein 2010). Based on soil boring information supplied to PAF in 2010, it was determined that some thin silt horizons were identified in those soil borings to the west of the present shoreline. These soil horizons (black silt or peat) were suggestive of wetlands along the former shoreline of Onondaga Lake. Soil borings on the shoreline contained either Solvay waste or marl, suggesting that the current shoreline was under water during precontact period times.

The mouth of the channel of Ninemile Creek was artificially created in the mid 20th century. The current mouth and the channel were dredged in the late 1960s with the original channel of Ninemile Creek being located approximately 549-610 m (1800-2000 ft) to the east. Additional borings were completed by Parratt Wolff, Inc. in 2010 on the northern shoreline of Wastebeds 1-8, just to the east of the confluence of Ninemile Creek and Onondaga Lake. The geomorphological analysis of those borings determined that the sediments along the northern shoreline were deposited in subaqueous, interior portions of the lake basin during the Holocene period (12,000 B.P. to present). The marl units within the sediments identified thin beds of peat which are accumulations of partially decayed organics more reflective of seasonally or intermittently inundated swamps, rather than stable, dry surfaces. Therefore, the northern shoreline of Wastebeds 1-8, which includes work for the Northern Shoreline pumping station, a portion of the Northern Shoreline access pathway and its adjacent forcemain, and the Remediation Area A hydraulic control system/maintenance pathway, did not encounter buried landscape segments or surfaces with the potential to recover archaeological materials (Urista, Aiuvalasit, and Schuldenrein 2011).
Top of Wastebeds 1-8 - Soil borings from on top of Wastebeds 1-8 in the vicinity of the former biosolids area, much of the Northern Shoreline access pathway and its adjacent forcemain, and the Ninemile Creek forcemain access pathway and its adjacent forcemain, identified Solvay waste and other waste materials situated on top of 1.5 m (5 ft) of marl and peat, with fine sand and silt below the marl/peat (Appendix IV, pp. 86-90). The top of Wastebeds 1-8 was created from Solvay waste and other waste materials from the 1920s through 1988 (Honeywell 2010, Stein 2004). Approximately 20-21 m (65-70 ft) of waste and fill are located above a natural horizon of peat and marl (in WB18-MW-06 S/I/D) (see Appendix IV, pp. 86-90). The biosolids area will be placed above the existing ground surface, the access pathways will be built 1-2 m (3-6) above the existing ground surface, and the forcemain will impact approximately 1.5 m (5 ft) below the existing surface. Therefore, the proposed construction activities will not impact any soil horizons that could have precontact period or postcontact period resources.

Eastern Shoreline access pathway - The Eastern Shoreline access pathway is to be built on an existing gravel roadway, which was constructed between 2005 and 2010 on an existing four wheeler/foot path. Adjacent to the gravel roadway, soil borings identify 1.5-5 m (5-16 ft) of Solvay waste, with marl below the waste (see Appendix IV, pp. 86-90). The gravel roadway will be built 1-2 m (3-6 ft) above the surrounding terrain and will not impact any intact soil horizons that could have precontact period or postcontact period resources.

Ditch A - Portions of Ditch A may have been constructed prior to the mid 20th century and upgraded in the 1950s when I-690 was constructed. The portion of the ditch near the shoreline may be present on the 1950s Cornell aerial photographs, although it is not definitely present. Remediation plans call for the cleaning of Ditch A down to its profile. By 1966, Ditch A is present (http://library24.library.cornell.edu - 20th century aerial photographs) and on a 1970 NYSDOT drawing of the installation of a pipe that runs under the ramp leading up to the State Fairgrounds parking area (Kubiak, pers. comm. 2011). Borings adjacent to Ditch A suggest that Solvay Waste covers marl deposits in the vicinity of the southeastern portion of the ditch. Therefore, the work within Ditch A will not impact any soil horizons that have precontact resources or postcontact period resources with research potential.

Ninemile Creek access pathway, forcemain and collection trench - The Ninemile Creek access pathway, forcemain, and collection trench are located on the west side of Wastebeds 1-8. The project area for the pathway is proposed between the elevation of 372 and 406 ft ASL; the forcemain is located between 375 and 430 ft ASL; and the collection trench is situated between approximately 370 and 375 ft ASL. A series of soil borings (SB 220-225) were completed by Parratt-Wolf in 2010 (Appendix VIII, pp. 99-205). These soil borings reflect a layer of Solvay Waste (between 2 to 8 ft in depth), with marl below the Solvay Waste at the northwest end of the impacts and silt (between 11 to 30 ft) below the Solvay Waste and above marl at the southeastern end of the proposed impacts. As with the Eastern Shoreline access pathway, the Ninemile Creek access pathway is to be constructed above the ground surface (in this area, 1-3 m (3-10 ft) above the existing ground and will not impact any intact soil horizons. The forcemain is to be placed at approximately 1.5 m (5 ft) below the surface and will be placed from the southeastern end of the Ninemile Creek access pathway to the proposed Ninemile Creek pumping station (see Appendix IX, pp. 206-235). The Ninemile Collection Trench is to be placed 3.7 to 4.6 m (12 to 15 ft) below the surface and will be placed from the proposed Ninemile Creek pumping station to 213 m (700 ft) northwest of the pumping station, as well as for the construction of the forcemain from the Ninemile Creek pumping station to 90 m (300 ft) southeast of the pumping station.
6.2 Archaeological Results

Based on soil borings and the geomorphological analysis, it was determined that some thin silt horizons associated with wetlands along the former shoreline of Onondaga Lake were identified in those soil borings away from the eastern shoreline. Soil borings on the shoreline contained either Solvay waste or marl, suggesting that the current shoreline was under water during precontact period times. In the summer of 2010, archaeologists from PAF excavated a series of 19 STPs on the western edge of the APE (Appendix VI, p. 96). These STPs were excavated to determine if, within the depths of the project impacts (1-1.2 m [3-4 ft]), there were any soil horizons indicative of the wetland shoreline, as well as to determine if any of the planned construction (the creation of wetlands, eastern shoreline seep collection, forcemain, the eastern shoreline collection trench, or the access pathway) would impact any precontact or postcontact resources, including those associated with the 19th to early 20th century Lake View Point Resort.

Solvay waste was identified in all 19 of the STPs. Compact solidified Solvay waste obstructed further excavation in 10 of the 19 STPs (Appendix VII, pp. 97-98). A post hole digging bar was utilized in the nine other STPs in order to reach depths of 90-100 cm (36-40 in) below the surface. The average depth of the STPs was 68 cm (27 in); the average depth of the STPs that were not obstructed by compact Solvay waste was 99 cm (40 in).

Two of the STPs that penetrated Solvay waste (STPs SH1 and SH3) encountered a dark grey brown sandy loam horizon below a horizon of grey marl. The soil horizon is located beneath a 20-35 cm (8-14 in) thick layer of grey marl deposits. The fluctuation from grey sandy loam to a dark grey brown sandy loam is similar to soil borings analyzed on the northern shore of Wastebeds 1-8 (Urista, Aiwalasit and Schuilenrein 2011) and is also suggestive of marl deposition. STPs SH1 and SH3 were located within 15-20 m (50-66 ft) of the present shoreline.

Solvay waste was found at the base of the remaining seven STPs that were excavated more than 80 cm (32 in) below the surface, suggesting that any other intact soil horizons were located deeper than 1.15 m (3.8 ft) below the surface. Based on the soil stratigraphy discussed in the Focused Feasibility Study (Honeywell 2010), the marl/peat horizons extended up to 915 m (3000 ft) west of the present shoreline. STPs SH4 through SH25 were located from 30 m to 110 m (100 to 361 ft) from the present shoreline.

The soil stratigraphy within the STPs suggests that the STPs nearest the shoreline have a thin layer of Solvay waste (24-25 cm [10 in]) on top of marl deposits, while the STPs away from the shoreline have a thick layer (more than 83-115 cm [33-45 in]) of Solvay waste. No cultural material was recovered within any of the STPs. Therefore, the STP testing did not locate any cultural resources associated with precontact activities or with resources associated with the Lake View Point Resort.

VII. SUMMARY AND RECOMMENDATIONS

Detailed geomorphological analysis, analysis of soil borings and literature, archaeological testing, as well as a review of project plans has determined that remediation work on top of and around Wastebeds 1-8 will not have impacts on any precontact or postcontact cultural resources, with several possible areas of exception. Construction impacts in silt horizons, underneath Solvay Waste, and above marl horizons, have been identified for 213 m (700 ft) of the Ninemile Creek collection trench, 91 m (300 ft) of the Ninemile Creek forcemain, as well as the Ninemile Creek pumping station.

Northern Shoreline (Northern Shoreline pumping station, portion of Northern Shoreline access pathway and adjacent forcemain, Remediation Area A Hydraulic Control System/maintenance pathway, Northern Shoreline collection trench maintenance road and Northern Shoreline collection trench). Initial geomorphological assessments suggested that the northern shoreline closely approximated the shoreline that existed prior to 1800, but much of this shoreline may have been wetlands. The shoreline prior to 1800 is noted on an early map (Figure 7, p. 12) as swamp and sedge (grasses commonly found associated with wetlands). Since wetlands are fragile environments, it is
unlikely that evidence of precontact land use would be found within these wetlands on the shoreline. The
gemorphological analysis completed through the use of additional borings in 2010 determined that the northern shoreline
contains sediments that are reflective of seasonally or intermittently inundated swamps, rather than stable, dry surfaces.
Therefore, there are no buried landscape segments or surfaces with the potential to recover archaeological materials
(Urista, Aiuvlasit, and Schuldenrein 2011). No further archaeological work is recommended for remdiation activities
in the Northern shoreline portion of Wastebeds 1-8.

Top of Wastebeds 1-8 (Biosolids area, majority of Northern Shoreline access pathway and adjacent forcemain,
and Ninemile Creek forcemain access pathway and adjacent forcemain). The former biosolids area, as well as the
Northern Shoreline access pathway and Ninemile Creek forcemain access pathway are located on top of Wastebeds 1-8.
The wastebeds were created from Solvay waste and other waste materials from the 1920s through 1988 (Honeywell 2010,
Stein 2004). Approximately 20-21 m (65-70 ft) of waste and fill are located above a natural horizon of peat and marl (in
WB18-MW-06 S/I/D) on top of Wastebeds 1-8 (see Appendix IV, pp. 86-90). Because impacts will be limited to a
maximum of 1.5 m (5 ft) below the surface, no further archaeological work is recommended for remediation activities
that will take place in the portion of the project that is located on top of Wastebeds 1-8.

Eastern Shoreline (wetlands, Eastern Shoreline seep collection trench, forcemain, Eastern Shoreline
collection trench, and the Eastern Shoreline access pathway). Detailed geomorphological analysis prior to the Phase
1B testing determined that the present eastern shoreline of Wastebeds 1-8 was under the lake level prior to the placement
of the industrial wastes in Wastebeds 1-8. The shoreline prior to 1800 is noted on an early map (Figure 7, p. 12) as swamp
and sedge (grasses commonly found associated with wetlands). Since wetlands are fragile environments, it is unlikely
that evidence of precontact landuse would be found within these wetlands on the shoreline. The western edge of the APE
on the eastern shoreline is 110 m (361 ft) from the present shoreline and prior to the archaeological survey, it was thought
that precontact or postcontact landuse may have occurred away from the present shoreline. The archaeological survey
that was completed on the western edge of the APE on the eastern shoreline determined that there were no precontact or
postcontact period landforms within the depth of project impacts that would have preserved activities that could have
taken place prior to the mid 20th century. No further archaeological work is recommended for remediation activities that
will take place in the Eastern shoreline portion of Wastebeds 1-8.

Ditch A. Portions of Ditch A may have been constructed prior to the mid 20th century and upgraded in the 1950s
when I-690 was constructed. Borings adjacent to Ditch A suggest that Solvay Waste covers marl deposits in the vicinity
of the southeastern portion of the ditch. Therefore, the work within Ditch A will not impact any soil horizons that have
precontact resources or postcontact period resources with research potential. No further archaeological work is
recommended for activities that will take place in the that portion of Ditch A that will be impacted (southeastern portion
of Ditch A).

Ninemile Creek (Ninemile Creek access pathway and adjacent forcemain, Ninemile Creek collection trench,
Ninemile Creek pump station). The Ninemile Creek access pathway, forcemain, and collection trench are located on the
west side of Wastebeds 1-8. The project area for the pathway is proposed between the elevation of 372 and 406 ft ASL.
Soil borings suggests that between 213 m (700 ft) northwest of the proposed pump station to 90 m (300 ft) southeast of
the proposed pump station, silt horizons may be impacted. These silt horizons are located beneath 0-1.2 m (0-4 ft) of
Solvay Waste and extend down to 4-6 m (13-20 ft) beneath the surface. Because these silt horizons are located away from
the earlier shoreline of Onondaga Lake and could contain resources associated with occupations along the lake during
the precontact or postcontact time periods, monitoring for cultural resources is recommended. The pathways are to be
constructed above the ground surface (in this area, 1-3 m (3-10 ft) and will not impact any intact soil horizons. The
forcemain is to be placed at approximately 1.5 m (5 ft) below the surface and will be placed from the southeastern end
of the Ninemile Creek access pathway to the proposed Ninemile Creek pump station (see Appendix IX, pp. 206-235).
The Ninemile Collection Trench is to be placed 3.7 to 4.6 m (12 to 15 ft) below the surface and will be placed from the
proposed Ninemile Creek pump station to the northwestern end of Ninemile Creek access
pathway (see Appendix IX, pp. 206-235). It is recommended that monitoring by a professional archaeologist and a member of the Onondaga Nation take place during the excavation of soils for the forcemain, the Ninemile Creek pumping station, and the collection trench for a total of 303 m (1000 ft) from 213 m (700 ft) northwest of the proposed pumping station to 90 m (300 ft) southeast of the pumping station

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