APPENDIX E

CAP-INDUCED SETTLEMENT EVALUATION

E.1

CAP SETTLEMENT

CAP-INDUCED SETTLEMENT EVALUATION
ONONDAGA LAKE

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LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
ASTM	American Society of Testing and Materials
FS	Feasibility Study
IDS	Initial Design Submittal
Lake	Onondaga Lake
pcf	pounds per cubic foot
PDI	Pre-Design Investigations
ROD	Record of Decision
SIC	seepage-induced consolidation

1 INTRODUCTION

This memorandum presents an estimate of the amount of consolidation settlement anticipated after placement of capping materials in portions of Onondaga Lake (Lake) (Figure 1). For the purposes of this evaluation, primary and secondary consolidation settlement was predicted based on the results of consolidation testing performed as part of the Onondaga Lake Pre-Design Investigations (PDI).

The areas evaluated in this memorandum include Remediation Areas A, B, C, and E. Capping is also anticipated in Remediation Area D and to a small extent in Remediation Area F. Settlement estimates for Remediation Area D (the In-Lake Waste Deposit) are presented in a separate memorandum (Geosyntec 2011). Since the extent of capping planned in Remediation Area F is limited, separate settlement estimates are not provided for this area.

In each of the Remediation Areas evaluated, the remedial action selected in the Record of Decision [ROD] includes subaqueous capping, either as a stand-alone remedy or following initial dredging. The basis of design for the limits and extents of the remedial actions are detailed in the Capping and Dredge Area and Depth Initial Design Submittal and refined in the Capping, Dredging, and Habitat Intermediate Design and presented on Figure 1.

The remainder of this memorandum is organized as follows:

- Section 2 – Subsurface Conditions
- Section 3 – Sediment Properties
- Section 4 – Settlement Analysis
- Section 5 – Conclusions
- Figures (see List of Figures)
- Attachment A – Consolidation Test Data Summary
- Attachment B – Example Settlement Calculation
- Attachment C – Summary of Modeling Inputs and Results

2 SUBSURFACE CONDITIONS

The subsurface conditions used for this analysis in Remediation Areas A, B, C, and E were based on a review of exploration logs from geotechnical borings and vibracores conducted as part of the PDI, as well as historical explorations by others. In general, representative stratigraphic cross-sections were developed for each Remediation Area (including multiple sections per area, where appropriate) to depict the general subsurface sediment profile. The separations between stratigraphic layers depicted on these cross-sections have been estimated based on visual observations denoted on exploration logs and on index tests performed in the laboratory. These separations are not intended to represent distinct transitions between layers because sediment types and properties often gradually grade from one layer to another in a natural deposit.

The subsurface conditions for each Remediation Area are generally described below and are depicted on Figures 3, 4, 5, 7, 8, 10, 11, 12, 14, 15, and 16. In addition, Attachment C provides a summary of the idealized subsurface stratification assumed for each settlement analysis case. Explorations advanced indicate a layer containing granular material (e.g. sand and/or gravel) is present at depth in most of the Remediation Areas. Although the spatial density of explorations penetrating to these depths is not sufficient to determine with certainty whether the sand layers are continuous across the entire site, they have been observed with enough frequency to be accounted for in assessing the drainage paths during the consolidation analysis, as discussed below. The presence (or absence) of these granular layers has an effect on the time rate of consolidation, but not on the magnitude of settlement.

Remediation Area A: Figure 2 presents the locations of explorations advanced within Remediation Area A. Three cross-sections, depicted on Figures 3 (A-A'), 4 (B-B'), and 5 (C-C'), were developed to illustrate the subsurface stratigraphy in Remediation Area A. The generalized subsurface profile consists primarily of a surface layer of gray silt with little clay, fine sand, and calcareous material. The gray silt layer is underlain by sand which is interbedded with clay in some areas, although this deeper stratum was only observed in some of the deeper nearshore explorations (e.g., 40002, 40003, 40033, and 40036) and one offshore exploration that penetrated deep enough (S305). The thickness of the silt layer appears to be greatest towards shore, at approximately 35 to 40 feet, and thins offshore to approximately 20 feet thick. In the immediate nearshore region on the eastern side of Remediation Area A, a surficial deposit of sand with some silt was observed overlying the silt layer to a depth of approximately 15 feet (see Figures 3 [A-A'] and 5 [C-C']). This sand deposit was underlain by the gray silt layer, followed by the clay and interbedded sand layer observed elsewhere in Remediation Area A, as described above. Although not observed in explorations in the western half of Remediation Area A, it is assumed that the sand drainage layer observed in the eastern half (40002, 40003, S305, etc.) is also present at deeper depths than sampled in the western half. The presence of interbedded sand layers in the deeper strata is expected to serve as a drainage layer below the overlying consolidating silt layer (i.e., the silt layer will be doubly drained).

Remediation Area B: Figure 6 presents the locations of explorations advanced within Remediation Area B. Two cross-sections illustrating the stratigraphy in Remediation Area B are presented on Figures 7 (D-D') and 8 (E-E'). The generalized subsurface profile consists of a surface layer of Solvay waste ranging in thickness from approximately 5 feet nearshore and far offshore to more than 25 feet in the central portions (e.g., halfway between shore and the offshore limit) of Remediation Area B. The Solvay waste layer is underlain by a layer of silt and clay (Marl). The Marl layer was estimated to be approximately 25 feet thick based on a deep exploration (30033). This exploration also indicated that the Marl was underlain by an approximately 11-foot-thick layer of clay, followed by a silt and fine sand layer (approximately 60 to 70 feet below the mudline) that is expected to act as a subsurface drainage layer (i.e., consolidation of overlying layers would be doubly drained).

Remediation Area C: The assumed subsurface conditions in Remediation Area C are based primarily on borings and cores advanced within the eastern portion of Remediation Area C, as well as two deep borings (20016 and 20017) advanced along the shoreline of Remediation Area C but outside of the proposed capping area (see Figure 9). A deep boring from Remediation Area B (30003) was used to create the subsurface profile for the westernmost cross-section of Remediation Area C. The generalized soil profiles for Remediation Area C are presented on Figures 10 (F-F'), 11 (G-G'), and 12 (H-H'). The generalized soil profile consists of a 10- to 20-foot-thick layer of black silt overlying soft to stiff brown and gray clay (Marl) extending to approximately 55 to 65 feet below the mudline. Occasional deposits of Solvay waste, ranging from 5 to 20 feet thick, were observed above the Marl and within the black silt layer. Below the Marl deposit, a layer of sand was observed in the three deep borings (20016, 20017, and 30003). This sand material is assumed to not undergo significant consolidation and will serve as a drainage layer below the overlying consolidating layers (i.e., the overlying layers will be doubly drained). In a few nearshore borings, the surficial silt layer contained a significant fraction of sand-sized particles, contributing to a lighter brown color.

Remediation Area E: Figure 13 presents the locations of explorations advanced within Remediation Area E. Three cross-sections, depicted on Figures 14 (I-I'), 15 (J-J'), and 16 (K-K'), were developed to illustrate the subsurface stratigraphy in Remediation Area E. The generalized subsurface profile includes a surficial layer approximately 10- to 20-feet-thick, consisting of fine to medium sand in the nearshore region, which grades to black silt with decreasing amounts of fine sand with distance from shore. The thickness of the sand layer was observed to decrease with distance from shore and grades from primarily sand in the most nearshore explorations to silt with some fine sand, and then eventually to just silt in the offshore portion of Remediation Area E.

Beneath the surficial layer of silt and fine sand is a layer of organic silt and clay that extends to the bottom of most explorations conducted within Remediation Area E (approximately 30 to 40 feet below the mudline). This organic silt layer appears consistent with the lacustrine (natural lake sediments) deposit noted on two historic deep boring logs from Remediation Area D (B-76-1 and B-76-2 – not shown on Figures) and a deep historic boring (TH-305) on the shoreline of Remediation Area E completed for the design of the sewage treatment plant. In boring TH-305, the lacustrine deposit was observed to extend to approximately 130 feet below the shoreline elevation, with underlying sandy silt. Given that the ground surface near this boring is approximately 20 feet higher than the average mudline within the Lake in Remediation Area E, the depth to the underlying silt and sand layer, which is expected to serve as a subsurface drainage layer (i.e., doubly drained), was assumed to be approximately 110 feet in the eastern portion of Remediation Area E. Based on deep borings advanced in Remediation Area D, the lacustrine deposit on the western side of Remediation Area E (bordering Remediation Area D; see Section I-I' Figure 14) was assumed to extend between approximately 100 and 150 feet below the mudline before transitioning to underlying glacial soils. However, since the underlying glacial soils were described as clay and silt on the historic boring logs, this layer was not assumed to provide for drainage on the western side of Remediation Area E. These assumptions for thickness of the lacustrine deposit are expected to be conservative relative to the time rate of settlement, which is highly dependent on the drainage distance for porewater expelled during consolidation. Therefore, the durations predicted for settlement to occur in Remediation Area E may be overestimated, as discussed in Table 1.

In the western portion of Remediation Area E (along the boundary with Remediation Area D), a thin (approximately 3 feet thick) surficial layer of very soft organic silt overlies the soil profile described above (see Section I-I' on Figure 14).

Several explorations were completed during the PDI in the immediate vicinity of the mouth of Onondaga Creek. It is expected that the near-surface (approximately to 10 feet) sediment conditions at this location may not be representative of other portions of the Remediation Area given the likely increased sedimentation from Onondaga Creek; therefore, these near-surface sediment characteristics were not included in the settlement estimates presented here.

3 SEDIMENT PROPERTIES

The geotechnical properties of the sediments used in this analysis were based on the results of relevant PDI sampling available to date (i.e., through Phase IV). In general, the Lake is considered a net depositional area, and therefore has likely not undergone any significant erosion which could contribute to over-consolidation of the surface sediments. In addition, there is no evidence to suggest that lake levels have been significantly lower in the recent past, subjecting the sediments to higher effective stress or event air-drying (i.e., desiccation), which could also result in the surface sediment becoming over-consolidated. Based on these observations, the surface sediments in most areas of the Lake are expected to be normally consolidated. The exception to this is the Solvay waste deposits, which are in an overconsolidated condition from the presence of an "apparent" pre-consolidation pressure (Geosyntec 2011).

The unit weight of the sediments was either measured in the laboratory or derived from measurements of moisture content and specific gravity on numerous samples collected within each Remediation Area. In general, the bulk density of the natural organic silt sediments ranges from approximately 80 to 90 pounds per cubic foot (pcf) near the surface to approximately 105 to 110 pcf at depth (30 to 50 feet below the mudline). Furthermore, the typical unit weight of the lacustrine deposits (deeper silt and clay layers; Marl) is approximately 96 to 102 pcf. These data indicate considerably higher unit weights than assumed during previous settlement analyses presented in the Feasibility Study (FS), where the unit weight of the organic silt was assumed to range from 74 to 81 pcf. This difference translates into smaller settlement estimates because settlement is a function of the increase in stress due to capping relative to the existing stress. With higher unit weights, the existing stress is larger and therefore the ratio of increased stress to existing stress is smaller.

The consolidation characteristics of the sediments were based on the results of numerous consolidation tests performed on samples collected during the PDI, including traditional oedometer tests (in accordance with American Society for Testing and Materials [ASTM] Method D2435) conducted on samples from Remediation Areas B, C, and D, as well as numerous seepage-induced consolidation (SIC) tests conducted on samples from all Remediation Areas.

Oedometer test samples were collected from sample intervals ranging from 10 feet to nearly 50 feet below the mudline representing the major geologic strata in Remediation Areas B and C (primarily silt, clay, and Marl). Attachment A provides a complete summary of the consolidation test results and index properties for the oedometer test samples.

The sample selection process for SIC testing included a review of index properties for a given stratum followed by establishing the range of characteristics that would be representative of that stratum. SIC testing was performed on samples collected from all major geologic strata including Solvay waste, silt, Marl, clay, and silt/sand ranging in depth from surface (beginning at mudline) to 20 feet below the mudline. Finally, samples were selected for testing to represent the range of index properties within each stratum. Attachment A contains a summary of the oedometer and SIC consolidation test results along with index test results for each sample.

The ranges of cases analyzed in the settlement evaluation presented herein included both SIC and oedometer test data from the various strata. Neither the SIC or oedometer test is preferred over the other; each test has its advantages and applicability to certain sediment conditions and sampling techniques. One advantage of the SIC test (compared to the conventional oedometer test) is the ability to apply relatively small loads in a controlled manner to very soft sediments. The SIC also provides a mathematical equation describing the consolidation characteristics (void ratio and permeability) as a function of stress. In addition, disturbed samples collected from vibracore samples can be used for SIC testing since all samples are homogenized and processed into a slurry prior to testing, whereas conventional oedometer tests are typically conducted on an undisturbed sample collected using a Shelby tube. However, the SIC test does not allow for determination of the pre-consolidation pressure, which can be used to asses the consolidation state (e.g. normally consolidated vs. overconsolidated), since the initial sample is disturbed. The conventional oedometer can be used for this purpose.

The results of the standard oedometer test can be interpreted to determine the compressibility characteristics of the sample, as follows:

$$C_c = \frac{e_1 - e_2}{\log \sigma'_2 - \log \sigma'_1} \quad (3\text{-}1)$$

where:

C_c = compression index

e = void ratio

σ' = effective stress

The SIC test is used to develop a relationship between effective stress, void ratio, and permeability through a set of parameters (A, B, C, D, and Z) that define the compressibility and hydraulic conductivity of the sediments given by the following expressions:

$$\text{Compressibility: } e = A(\sigma' + Z)^B \quad (3\text{-}2)$$

$$\text{Hydraulic Conductivity: } k = C\, e^D \quad (3\text{-}3)$$

where:

e = void ratio

σ' = effective stress

k = hydraulic conductivity

A, B, C, D, and Z = coefficients determined through the SIC test; dependent on the system of units and presented in Attachment A for SI units

The properties of the cap materials were selected based on typical sand and gravel soils placed using either mechanical or hydraulic techniques. An in situ porosity of 40 percent was assumed for sand and gravel with a specific gravity of 2.55. With these assumptions, the total unit weight of the cap materials was assumed to be approximately 120 pcf.

4 SETTLEMENT ANALYSIS

The compressibility and hydraulic conductivity relationships defined above were used to estimate the amount and rate of primary consolidation expected after the placement of a subaqueous cap. Due to time constraints associated with production of the Intermediate Design, settlement evaluations in this Appendix are based on cap and dredge plans that are slightly different than the cap and dredge plan included in Appendix F of this Intermediate Design. In general, evaluations are based on cap thicknesses and dredge cuts that are approximately 6 to 12 inches greater than that shown in Appendix F. The impacts of these deviations tend to cancel each other out, therefore predicted settlements based on Appendix F plans are expected to be similar to those developed herein. Settlement predictions will be refined for consistency for the Draft Final Design. Geotechnical index tests were used to estimate a secondary compression index for the site sediments, which was used in conjunction with the results of several representative primary consolidation analyses to generate an estimated range of secondary compression settlement (see Section 4.3).

4.1 Cap Induced Load Estimates

The change in stress (i.e., load) resulting from the remedial construction was estimated for each of the cases analyzed with consideration of the reduction in stress from the planned dredging and increase in stress resulting from the cap placement. In areas where dredging will be performed prior to cap placement, the reduction in stress on the subsurface sediments was calculated using the thickness of the dredge cut and the unit weight of the material to be dredged (ranging from approximately 80 to 110 pcf, depending on the material type). The increase in effective stress on the existing or post-dredge sediment surface resulting from the placement of the capping materials was computed using the thickness of the cap and the total unit weight of the capping materials (assumed to be 120 pcf for all caps based on an assumed specific gravity of 2.55 and porosity of 0.4). It should be noted that the unit weight of the capping materials is approximately 1.1 to 1.5 times larger than the unit weight of the dredge material. Therefore, for a scenario where the dredge depth matches the cap thickness (i.e., no net change in mudline elevation), some amount of settlement would still be predicted since there would be a net increase in stress on the existing sediments.

For cases where a net increase in stress is computed based on the dredge and cap thicknesses, the stress increase was assumed to be constant with depth due to the large spatial extent of the placed caps. This assumption likely results in slightly conservative (over-prediction) estimates of the cap-induced settlement along the very edges of the caps. The change in stress resulting from dredging (where applicable) and subsequent cap placement was used to compute settlement in accordance with the methodology summarized below.

4.2 Settlement Magnitude from Primary Consolidation

The primary consolidation settlement within each geologic layer was estimated using the assumed subsurface profiles described in Section 2 for each remediation area and the equations below. Each layer shown in the subsurface profile was divided into 10 equal sub-layers, and the net increase in effective stress (and resulting change in void ratio) for each sub-layer was computed based on the increased stress due to the assumed unit weight and thickness of capping material reduced by the unit weight and thickness of the in-situ material dredged. The total settlement for a given profile was then estimated as the sum of the settlement of each sub-layer.

Using oedometer test results (see Attachment B for example calculation), settlement was estimated using the following equation:

$$\Delta H = H \frac{C_c}{1+e_o} \log\left(\frac{\sigma'_o + \Delta\sigma'}{\sigma'_o}\right) \tag{4-1}$$

Using SIC test data (see Attachment B for example calculation), settlement was estimated using the following equation:

$$\Delta H = H \frac{e_o - e_f}{1+e_o} \tag{4-2}$$

where:

ΔH = settlement of layer

H	=	initial thickness of layer
σ'_o	=	initial effective stress prior to cap placement at mid-height of layer
$\Delta\sigma'$	=	change in effective stress as a result of cap placement at mid-height of layer
e_o	=	initial void ratio at effective stress of existing conditions, as determined from consolidation results
e_f	=	final void ratio at effective stress after capping, as determined from consolidation test results

In the cases where SIC data were used to estimate the settlement of a layer, the initial and final void ratio used in equation 4-2 for a given increase in stress were computed using equation 3-2, which defines the relationship between void ratio and stress, as determined through SIC testing. Attachment B provides a detailed step-by-step example calculation of the settlement estimate using both oedometer and SIC test data.

Based on the field investigations and subsequent lab testing conducted as part of the PDI, some of the geologic units are characterized by a range of thicknesses and/or a range of physical properties over a given Remediation Area. For instance, laboratory consolidation tests were conducted on multiple samples collected from the same geologic unit, indicating varying compressibility and/or permeability. As indicated previously, the SIC test samples were selected to be representative of the anticipated range of parameters for a given stratum. In order to assess the range of settlement estimates resulting from these observed variations, several "cases" were evaluated for each Remediation Area. Each case used a unique set of input parameters (e.g., results of laboratory testing on a given sample), and a unique settlement estimate was developed for each case. The range of results for multiple cases within a given Remediation Area were tabulated, as summarized in Table 1. The example calculation presented in Attachment B represents a single case, and a summary of modeling inputs and results is provided in Attachment C. A complete set of all calculations is provided in digital form as an attachment to this memorandum (see attached compact disc).

4.3 Settlement Magnitude from Secondary Compression

Settlement due to long-term plastic adjustment of the fabric of the soils under constant effective stress (i.e., secondary compression) was evaluated for this analysis. The secondary compression index for the Onondaga Lake sediments was estimated based on correlations to index properties (Bowles 1996; Holtz and Kovacs 1981). Modified secondary compression indices are summarized in Attachment C for each geologic layer and range from .002 to .07. The modified secondary compression index is related to the secondary compression index by the following equation:

$$c_{\alpha\varepsilon} = \frac{c_{\alpha}}{1+e_f} \qquad (4\text{-}3)$$

where:

$c_{\alpha\epsilon}$ = modified secondary compression index

c_{α} = secondary compression index

e_f = final void ratio at effective stress after capping, as determined from consolidation test results

Based on this modified secondary compression index, the magnitude of secondary compression settlement will typically be considerably less than the estimated primary consolidation settlement. Secondary compression was estimated by the following equation:

$$\delta_s = c_{\alpha\varepsilon} H \log\left(\frac{t}{t_p}\right) \qquad (4\text{-}4)$$

where:

δ_s = estimated settlement due to secondary compression

H = initial thickness of layer

t = time after application of load

t_p = time required to complete consolidation settlement, in theory this is infinite but it is assumed to occur when 90 percent of the primary consolidation is complete.

Similar to primary consolidation, secondary compression within each geologic layer was estimated using the assumed subsurface profiles described in Section 2. Secondary compression settlements were estimated for each module and remediation area across the site, taking into account the varied subsurface geology and variety of dredging and capping situations in each habitat module. For this analysis, secondary compression settlement was estimated over a 30-year period following cap construction. The results of the analysis indicate that secondary compression settlement across the site is estimated to range between 0 and 23 inches with an average of approximately 6 inches, as summarized in Table 1.

Table 1
Estimated Cap-Induced Settlement

Remediation Area Habitat Module (Water Depth Range)	Cap Thickness [a] [ft]	Dredge Depth [a] [ft]	Estimated Consolidation After 2 Years [inches]	Estimated Total Primary Consolidation [inches]	Estimated Time to Reach 90% Consolidation [years]	Estimated Total Secondary Compression [b] [inches]
Remediation Area A						
Module 1 (-20 to -30 ft)	2.25	0	10 to 13	10 to 14	0.3 to 2	4 to 5
Module 2A (-7 to -20 ft)	3.75	0	11 to 19	11 to 20	0.4 to 2	4 to 5
Module 3A (-3 to -7 ft)	4.25	0.5 to 5	7 to 19	7 to 21	0.4 to 2	4 to 6
Module 3A (-2 to -3 ft)	5.00	0.5 to 4.5	11 to 22	12 to 23	0.4 to 2	4 to 5
Module 5A/6A (+1 to -2 ft)	5.5	0.5 to 3.5	14 to 22	14 to 23	0.4 to 2	0 to 5
Remediation Area B						
Modules 1 and 2 (-10 to -30 ft)	3.75	0	10 to 30	19 to 38	1 to >30	0 to 21
Module 2 (-7 to -10 ft)	3.75	0	10 to 30	19 to 38	1 to >30	0 to 21
Module 3A (-4 to -7 ft)	4.25	1 to 5.25	9 to 26	14 to 32	1 to >30	0 to 23
Module 3A (-2 to -3 ft)	5.50	1 to 5.25	11 to 34	19 to 43	1 to >30	0 to 21
Module 5A (-0.5 to -2 ft)	5.50	3.75 to 5.5	10 to 33	17 to 41	1 to >30	0 to 22
Remediation Area C						
Modules 1 and 2 (-10 to -30 ft)	3.75	0.0	7 to 24	9 to 29	3 to >30	0 to 8
Module 2 (-7 to -10 ft)	3.75	0.0	7 to 24	9 to 29	3 to 7	0 to 8
Module 3B (-4 to -7 ft)	4.25	0.5 to 8	0 to 25	0 to 30	2 to 6	0 to 9
Module 3B (-2 to -3 ft)	5.5	0.5 to 8	0 to 23	0 to 29	3 to 10	0 to 8
Module 5B (-0.5 to -2 ft)	5.5	0 to 6.5	4 to 25	4 to 29	3 to >30	0 to 8

Remediation Area Habitat Module (Water Depth Range)	**Cap Thickness [a] [ft]**	**Dredge Depth [a] [ft]**	**Estimated Consolidation After 2 Years [inches]**	**Estimated Total Primary Consolidation [inches]**	**Estimated Time to Reach 90% Consolidation [years]**	**Estimated Total Secondary Compression [b] [inches]**
Remediation Area E						
Module 1 (-20 to -30 ft)	2.75	0	17 to 29	19 to 37	2 to 9	7 to 17
Module 2 (-7 to -20 ft)	3.50	0	19 to 32	24 to 41	2 to 10	7 to 16
Module 3B (-3 to -7 ft)	5.00	0 to 6	8 to 31	13 to 52	0.5 to >30	0 to 23
Module 3B (-2 to -3 ft)	5.50	2.5 to 6.25	8 to 23	10 to 35	0.5 to >30	0 to 24
Module 5B (-0.5 to -2 ft)	5.50	2 to 4.5	12 to 23	16 to 36	0.5 to >30	0 to 23
Module 6B (+1 to -1 ft)	5.50	3 to 5	11 to 22	15 to 34	0.5 to >30	0 to 24

Notes:

General: Each individual case that was analyzed to create this table is summarized in Attachment C.

a. Cap thicknesses and corresponding dredge depths used in this analysis represent reasonable maximums (including maximum overplacement allowances). Based on ongoing efforts to minimize overplacement, actual cap thicknesses are expected to be less; therefore, these estimates represent a conservative upper bound of the anticipated settlement.

b. Secondary settlement was evaluated over a 30 year timeframe which is expected to be the design life of the cap.

4.4 Settlement Rate

The rate at which the primary consolidation will occur is dependent on a number of factors including the permeability of the compressible sediment, which is used to calculate the coefficient of consolidation, c_v, along with the change in void ratio caused by the placement of the cap, according to the following relationship:

$$c_v = \frac{k(1+e_o)}{\left(\Delta e / \Delta\sigma_v\right)\gamma_w} \qquad (4\text{-}5)$$

where:

c_v = coefficient of consolidation

k = permeability

e_o = initial void ratio

Δe	=	change in void ratio caused by placement of the cap
$\Delta\sigma_v$	=	change in vertical stress caused by placement of the cap
γ_w	=	unit weight of water

The coefficient of consolidation is related to a non-dimensional number called the time factor, T_v, which is calculated according to the following equation:

$$T_v = \frac{c_v t}{H_{dr}^2} \qquad (4\text{-}6)$$

where:

T_v	=	time factor
c_v	=	coefficient of consolidation
H_{dr}	=	length of drainage path
T	=	time

The time factor can be calculated for various time intervals for each compressible layer. The time factor is also related to the degree of consolidation (i.e., percent consolidation), U, by the following relationships:

$$\text{For U = 0 to 60\%,}\ T_v = \frac{\pi}{4}\left(\frac{U\%}{100}\right)^2 \qquad (4\text{-}7)$$

$$\text{For U > 60\%,}\ T_v = 1.781 - 0.933\log(100 - U\%) \qquad (4\text{-}8)$$

By mathematically rearranging these relationships, the degree of consolidation can be estimated from the time factor for a given time as follows:

$$\text{For U = 0 to 60\%,}\ U\% = 100\sqrt{\frac{4T_v}{\pi}} \qquad (4\text{-}9)$$

$$\text{For U > 60\%,}\ U\% = 100 - 10^{\left(\frac{T_v - 1.781}{-0.933}\right)} \qquad (4\text{-}10)$$

Attachment B provides a detailed step-by-step example calculation of the time rate of settlement estimate.

Table 1 provides a summary of the estimated primary consolidation settlement within habitat modules for each Remediation Area. In addition, the estimated primary settlement 2 years after cap placement is presented, which has been used to support ongoing habitat planning. Finally, the approximate time to achieve 90 percent of the total primary consolidation is also presented for each case. It should be noted that a range of values is presented in most cases, reflecting the range of soil conditions observed in the field and laboratory.

As noted above, a range of results was estimated for most cases based on varying soil conditions. It should be noted that the time rate of primary settlement is highly dependent on the drainage distance (i.e., the distance that porewater expelled during consolidation must flow to a highly permeable layer, such as a sand/gravel layer) within a particular compressible layer. The time rate of settlement is related to the square of the drainage distance. However, it is often difficult to accurately identify minor sand lenses that may act as drainage layers within a natural deposit using traditional exploration techniques (e.g., geotechnical borings with samples collected every 2.5 or 5 feet). Therefore, time rate of settlement estimates could be overestimated if these drainage layers exist, but were not identified during field investigations.

4.5 Total Settlement Results

In general, results of the settlement analysis indicate that primary consolidation settlements predicted across the whole site could vary from 0 to 52 inches within 2 years of placement and from 0 to 57 inches over or more 30 years. Additional settlements due to secondary compression may occur and are predicted to range from 0 to 24 inches. Table 1 presents the range of primary and secondary settlements. It should be noted that evaluation scenarios resulting in maximum primary settlement do not necessarily correspond to the maximum secondary settlement. A comprehensive set of consolidation estimates presenting the range in consolidation for varying scenarios are presented in Attachment C.

Primary consolidation from dredging and capping in Remediation Area A is predicted to result in settlements of 7 to 23inches. Most of this settlement (greater than 90 percent) is expected to occur within the first 2 years after capping. Secondary consolidation from dredging and capping in Remediation Area A is predicted to result in settlements of 4 to 6. Total estimated settlements in Remediation Area A are predicted to vary from 12 to 28 inches in 30 years. The range of primary and secondary consolidation settlements take into account the maximum and minimum dredge cuts, the varying subsurface lithology, and a range of capping thicknesses for each habitat module (see Attachment C for a summary of each individual case analyzed).

Primary consolidation from dredging and capping in Remediation Area B is predicted to result in settlements of 14 to 43 inches. Some of this settlement could take over 30 years to reach 90 percent consolidation, due to the thickness of the compressible deposit and the lack of observed intermediate drainage layers during field investigations. However, as discussed in Section 4.3, if these intermediate drainage layers do exist, the actual time to reach 90 percent consolidation may be significantly reduced. Secondary consolidation from dredging and capping in Remediation Area B is predicted to result in settlements of 0 to 8 inches. Total estimated settlements in Remediation Area B are predicted to vary from 18 to 57 inches in 30 years. The range of primary and secondary consolidation settlements takes into account the maximum and minimum dredge cuts, the varying subsurface lithology, and a range of capping thicknesses for each habitat module.

Primary consolidation from dredging and capping in Remediation Area C is predicted to result in settlements of 0 to 30 inches. Some of this settlement could take over 30 years to reach 90 percent consolidation, due to the thickness of the compressible deposit and the lack of observed intermediate drainage layers during field investigations. Similar to the discussion above for Remediation Area B, the actual rate of settlement may be quicker if intermediate drainage layers that were not identified during field investigations actually exist in the field. Secondary consolidation from dredging and capping in Remediation Area C is predicted to result in settlements of 0 to 10 inches. Total estimated settlements in Remediation Area C are predicted to vary from 0 to 37 inches in 30 years. The range of primary and secondary consolidation settlements takes into account the maximum and minimum dredge cuts, the varying subsurface lithology, and a range of capping thicknesses for each habitat module.

Primary consolidation from dredging and capping in Remediation Area E is predicted to results in settlements of 10 to 54 inches. Some of this settlement could take over 30 years to reach 90 percent consolidation. Similar to the discussion above for Remediation Areas B and C, the actual rate of settlement may be quicker if intermediate drainage layers that were not identified during field investigations exist in the field. Secondary consolidation from dredging and capping in Remediation Area E is predicted to result in settlements of 0 to 23 inches. Total estimated settlements in Remediation Area E are predicted to vary from 12 to 53 inches in 30 years. The range of primary and secondary consolidation settlements takes into account the maximum and minimum dredge cuts, the varying subsurface lithology, and a range of capping thicknesses for each habitat module.

Primary consolidation settlements as high as 52 inches are predicted in some areas, mainly in capping-only areas (i.e., no prior dredging). Secondary consolidation settlements as high as 24 inches are predicted where thick deposits of compressible sediments (greater than 90 feet) exist. Primary consolidation in these areas is generally less than 30 inches due to sediment properties and dredge depth/cap thickness combinations. The areas of largest settlement are typically in habitat modules 1, 2, and 3B, where thin-cut or no dredging will take place. These areas are typically far from shore in deeper water (3 to 20 feet). Settlements of this magnitude are not expected to have adverse impacts on sediment stability or cap effectiveness given the broad areas over which they will occur and the gently sloping bathymetry of the Lake. In addition, these settlement estimates have been accounted for in assessing post-construction water depths as it relates to habitat planning.

4.6 Differential Settlement

Differential settlements were computed by comparing settlements between adjacent modules. Based on calculations, predicted settlements from adjoining habitat modules result in differential settlements ranging from 0 to 21 inches. However, in reality the difference in dredging depths, capping thicknesses, subsurface stratigraphy, and geotechnical properties will be gradual and not immediately change when a boundary of two habitat modules is encountered. Instead, the dredge depths and final surfaces will progressively change along the lake bottom, and the capping will be naturally graded from one thickness to another. As part of this grading, minimum cap thicknesses and habitat layer thicknesses will be met in all areas. Additionally, the lacustrine natural deposits that comprise the geologic profiles likely will vary gradually as well, from one cross-section to another.

In addition to the gradual variation in natural sediment deposits discussed above, the sand and gravel caps that will be placed are "flexible" and tolerant of significant differential settlements without affecting the cap's functionality or environmental protectiveness. The cap will flow seamlessly from one module to another, sloping along the angle of repose of the cap materials. Furthermore, caps will be constructed with a "run-out" beyond the required limits of capping, where the cap tapers off from its full thickness at the edge of the capping area to zero some distance away. This run-out will prevent excessive differential settlement at the edges of the cap areas.

4.7 Cumulative Pore Water Expression

For chemical isolation modeling purposes (see Appendix B of this Intermediate Design Report), a relationship was needed to describe the cumulative flux of pore water associated with settlement into the cap over time. As a simplistic, yet appropriately conservative, approach, the average total predicted settlement (including primary and secondary consolidation) for each remediation area was used, along with a representative estimate of the time over which 90% of that settlement would occur, to define that relationship. Consistent with the method used to define pore water expression in Remediation Area D (GeoSyntec 2011), a power function was used to define this conservative time-rate of settlement relationship:

$$F = AT^{B} \tag{4-11}$$

where:

T = Time

A = Power-fit parameter

B = Power-fit parameter

F = Cumulative flux of porewater

The function was developed for each Remediation Area (A, B, C, and E), by specifying the fit parameters (A and B) needed to achieve the desired total cumulative pore water flux (which ranged from 17 inches in Remediation Area A to 38 inches in Remediation Area B) and the timeframe over which 90 percent of that flux would occur (which ranged from 1 year in Remediation Area A to 8 to 9 years in Remediation Area B) for each area. Figure 17 provides the various relationships for each remediation area used for chemical isolation modeling.

4.8 Consideration of Field Testing Program for Settlement Assessment

A cap test fill is often used to confirm theoretical calculations such as constructability or settlement. A cap test fill was considered to further evaluate/refine the predicted settlement results. A test cap would be required to cover a large area with a cap and may take several years to obtain beneficial results. If a test was to be done, it would need to be in an area near one of the current cross-sections on which the settlement analyses are based, or additional sample collection would be required to correlate with the field test results. The test cap would ideally span over several of the habitat modules and be constructed at large enough scale to create enough surface pressure to influence the deeper soft soils. It may also be desirable to perform some amount of dredging beforehand in portions of the test area in order to obtain final habitat elevations. Dredging would require disposal and cause potential resuspension issues. A cap test like this would need sufficient monitoring for the results to be useful as well. A cap test fill to evaluate settlement predictions was not considered further, given the time limitations and the potential impacts described above.

5 CONCLUSIONS

This memorandum presents an estimate of the amount of primary and secondary consolidation settlement that may be expected following placement of a subaqueous cap in Remediation Areas A, B, C, and E of Onondaga Lake. In general, the existing sediments within Onondaga Lake are expected to undergo consolidation settlement following placement of capping materials. The magnitude of settlement is governed by the thickness of the planned caps and the amount (thickness) of planned sediment removal (dredging) prior to cap placement. In general, as dredge depth increases, the amount of post-cap settlement decreases for a constant cap thickness.

As discussed herein, cap-induced settlement predictions were made for a number of "cases" representative of each habitat module based on varying sediment properties and dredge depths. Since it is not possible to pinpoint specific properties and design conditions for each and every habitat module, a range of settlement predictions are provided that can be used to support estimates of the post-construction (following dredging, capping, and long-term settlement) mudline.

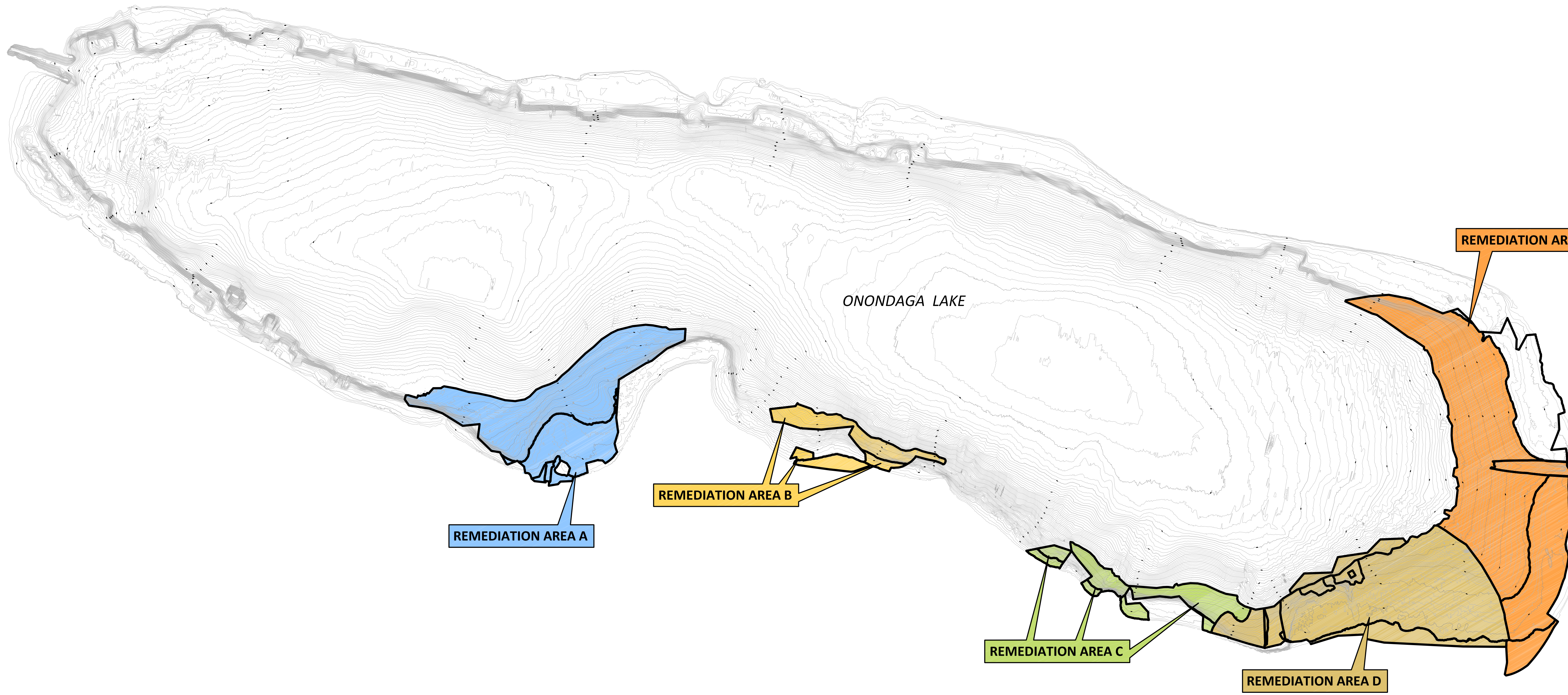
6 REFERENCES

Bowles, Joseph E. .1996. *Foundation Analysis and Design Fifth Edition*. Published by McGraw Hill, 1996.

Geosyntec Consultants. 2011. *Cap-Induced Settlement Evaluation for Remediation Area D; Onondaga Lake, Syracuse, New York*. Prepared for Parsons.

Holtz, Robert and W. Kovacs. 1981. *An Introduction to Geotechnical Engineering*. Published by Prentice-Hall, Inc.

FIGURES



SOURCE: Basemap provided to Anchor QEA by Parsons in September 2008.
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88), U.S. Survey Feet.
HORIZONTAL DATUM: New York State Plane, Central Zone, North American Datum of 1983 (NAD83), U.S. Survey Feet.
BATHYMETRIC SURVEY: Performed by CR Environmental, Inc., for Honeywell in 2005.
NOTES:
1. Ground surface contour is two feet.
2. All locations and features are approximate.

LEGEND:

Existing Bathymetric Contour in Feet

0 1600
Scale in Feet

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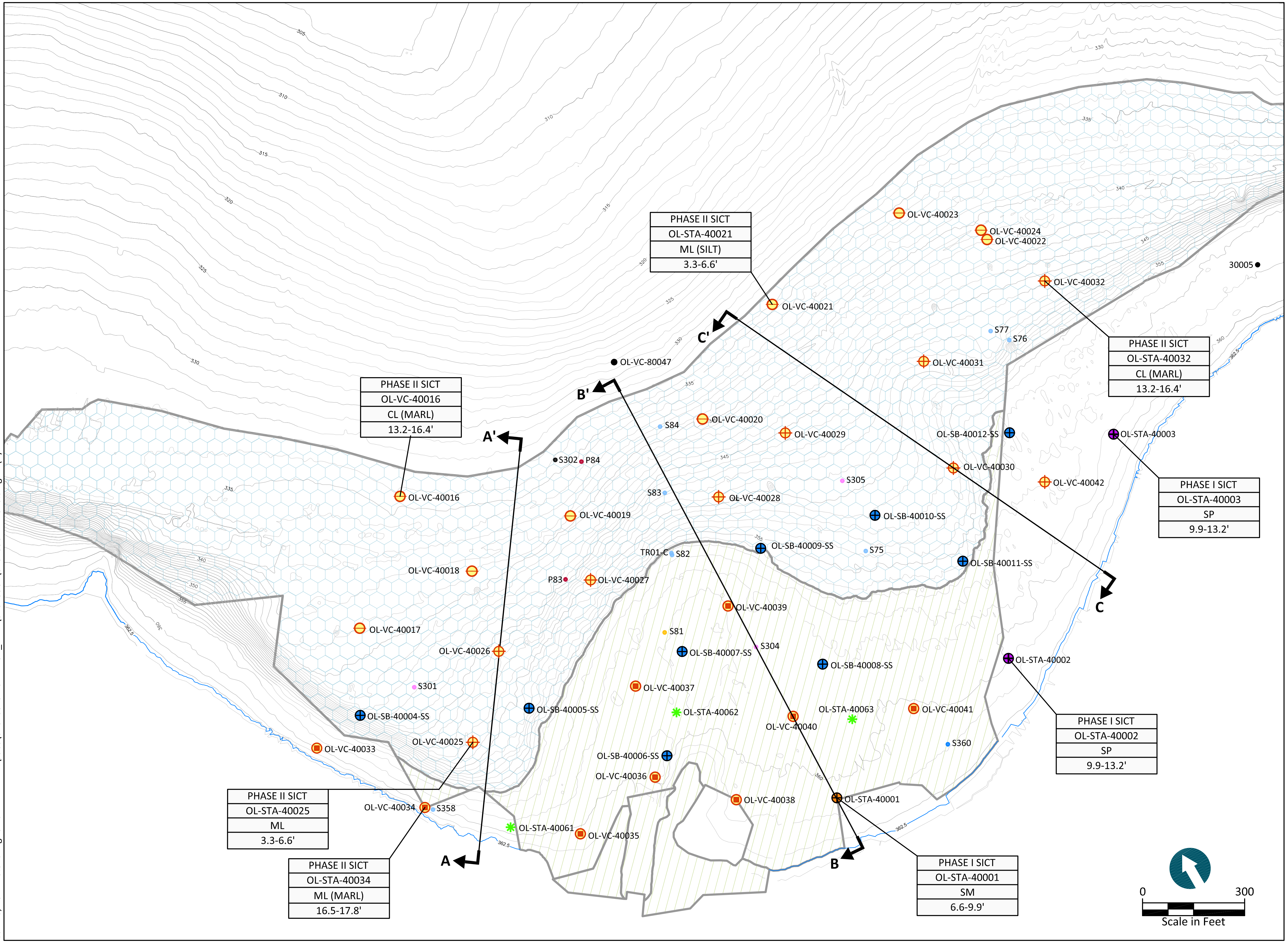
Jan 16, 2011 10:44am ghowell

ANCHOR QEA

Figure 1
Plan View Map of Remediation Areas
Cap-Induced Settlement Evaluation
Onondaga Lake



LEGEND:

340 Existing Bathymetric Contour in Feet

Dredge and Cap

Cap Only

B Cross Section Location and Designation

PHASE II SICT	Test Type
OL-STA-40032	Boring ID
CL (MARL)	Soil Type
13.2-16.4'	Sampling Depth

(SICT - Seepage-Induced Consolidation Test)

PHASE II PDI SAMPLE LOCATIONS

- 20 ft (6m) Core (Sample 0-0.5 ft and 0.5-3.3 ft)
- 20 ft (6m) Core (Sample on 3.3 ft intervals to 10 ft)
- 20 ft (6m) Core (Sample on 3.3 ft intervals to 20 ft)
- Bulk Density Sample

PHASE I PDI SAMPLE LOCATIONS

- 13 ft (4m) Core and Vane Shear/Atterberg Limits
- 33 ft (10m) Boring, 13 ft (4m) Core, Vane Shear/ Atterberg Limits and Porewater Samples (Groundwater Model)
- Vane Shear/Atterberg Limits (No Chemical Analysis)

RI/FS LOCATIONS

- 0.07-0.16 ft (0-5cm)
- 0.17-0.50 ft (5-15cm)
- 0.5-1.0 ft (15-30cm)
- 1.0-3.3 ft (30-100cm)
- 3.3-7.0 ft (1-2m)
- 7.0-13.0 ft (2-4m)
- 13.0-17.0 ft (4-5m)
- 17.0-26.0 ft (5-8m)

SOURCE:
1. Basemap provided to Anchor QEA by Parsons in September 2008.
2. All samples provided by Parsons, 2006.

VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88), U.S. Survey Feet.
HORIZONTAL DATUM: New York State Plane, Central Zone, North American Datum of 1983 (NAD83), U.S. Survey Feet.
BATHYMETRIC SURVEY: Performed by CR Environmental, Inc., for Honeywell in 2005.
NOTE:
All locations and features are approximate.

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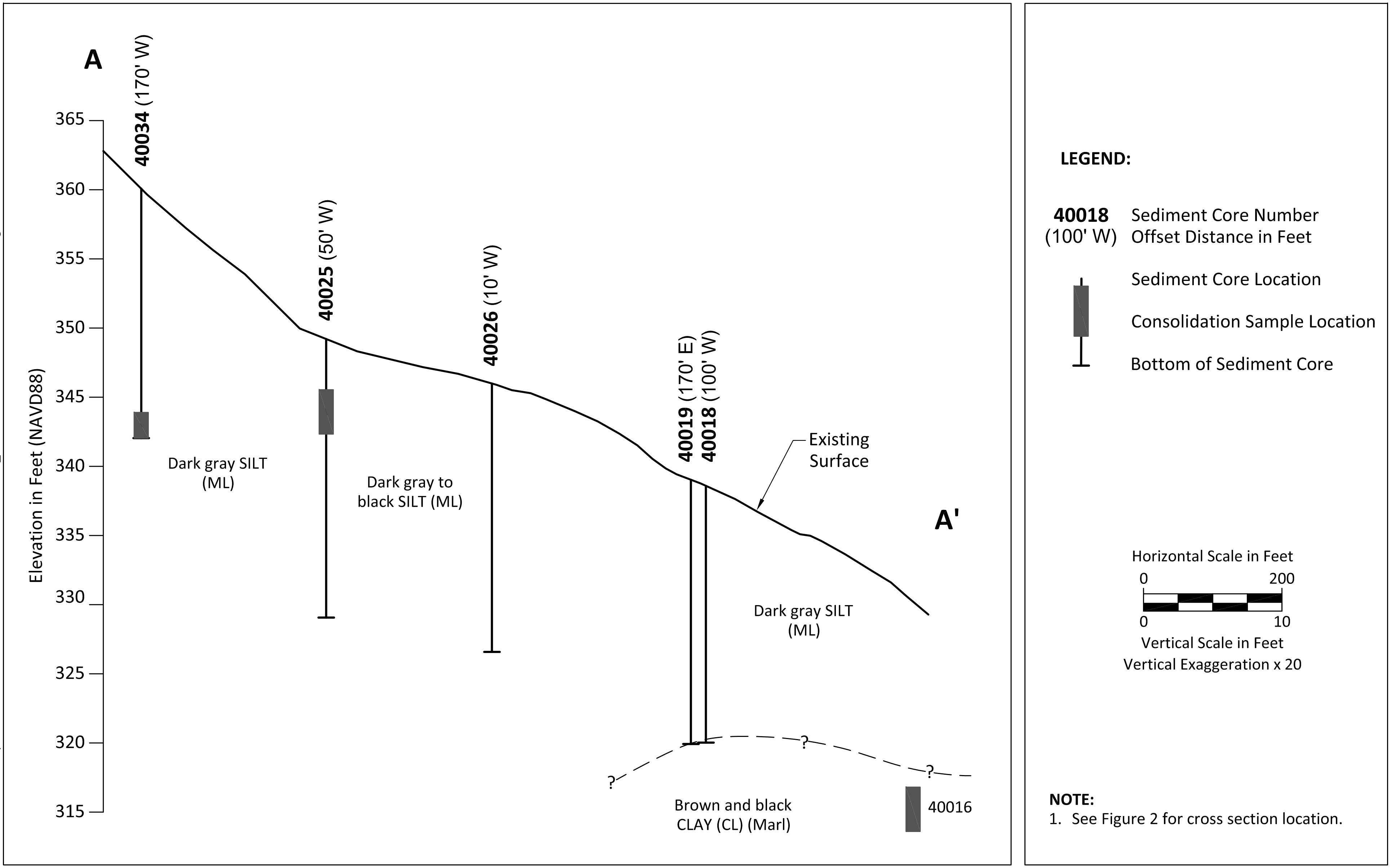
Jan 16, 2011 10:34am ghowell

ANCHOR QEA

Figure 2
Plan View Map of Remediation Area A
Cap-Induced Settlement Evaluation
Onondaga Lake



NOTE:

1. See Figure 2 for cross section location.

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Nov 20, 2009 12:28pm heriksen

Figure 3

Typical Cross Section A-A' - Remediation Area A

Cap-Induced Settlement Evaluation

Onondaga Lake

ANCHOR QEA

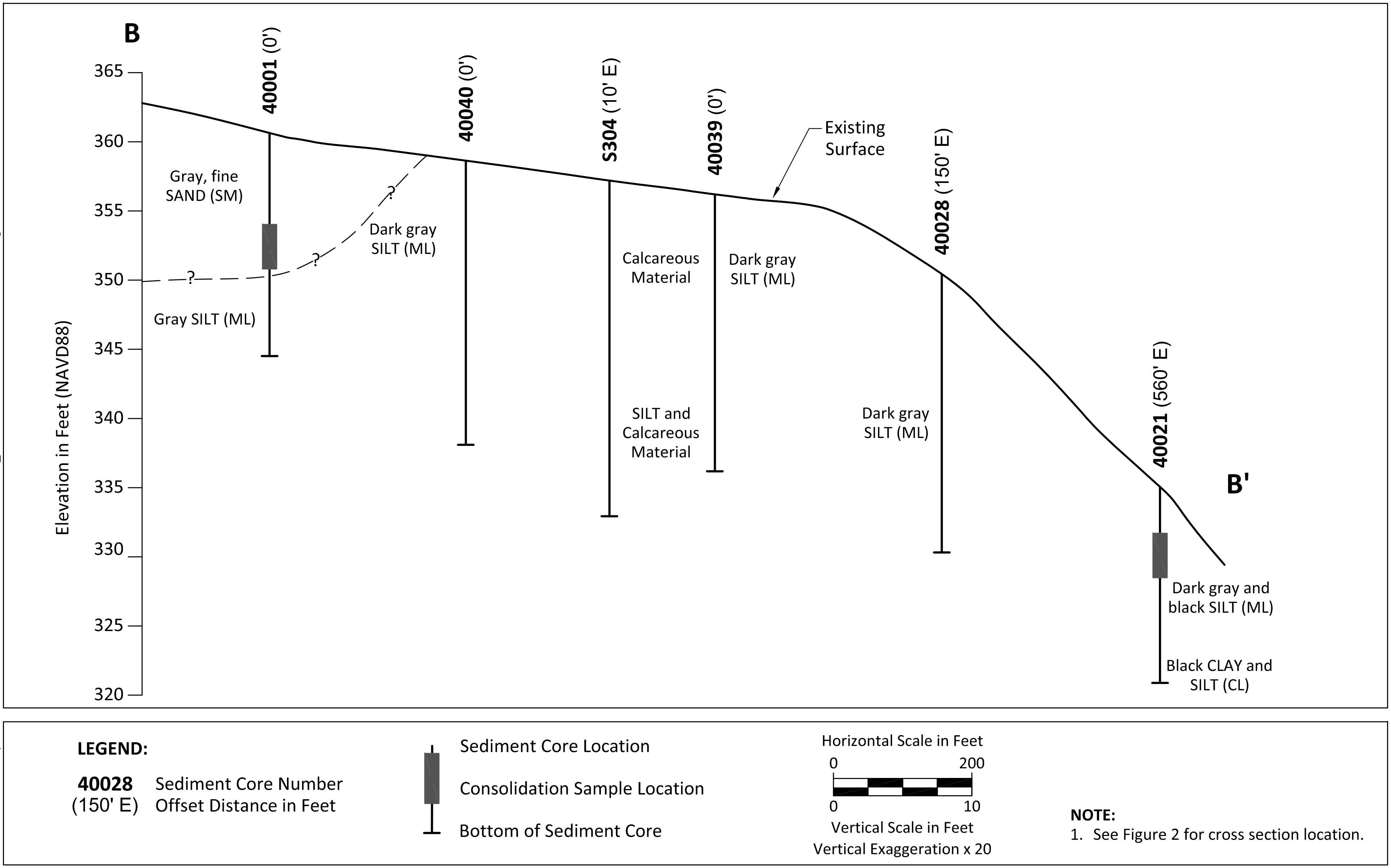
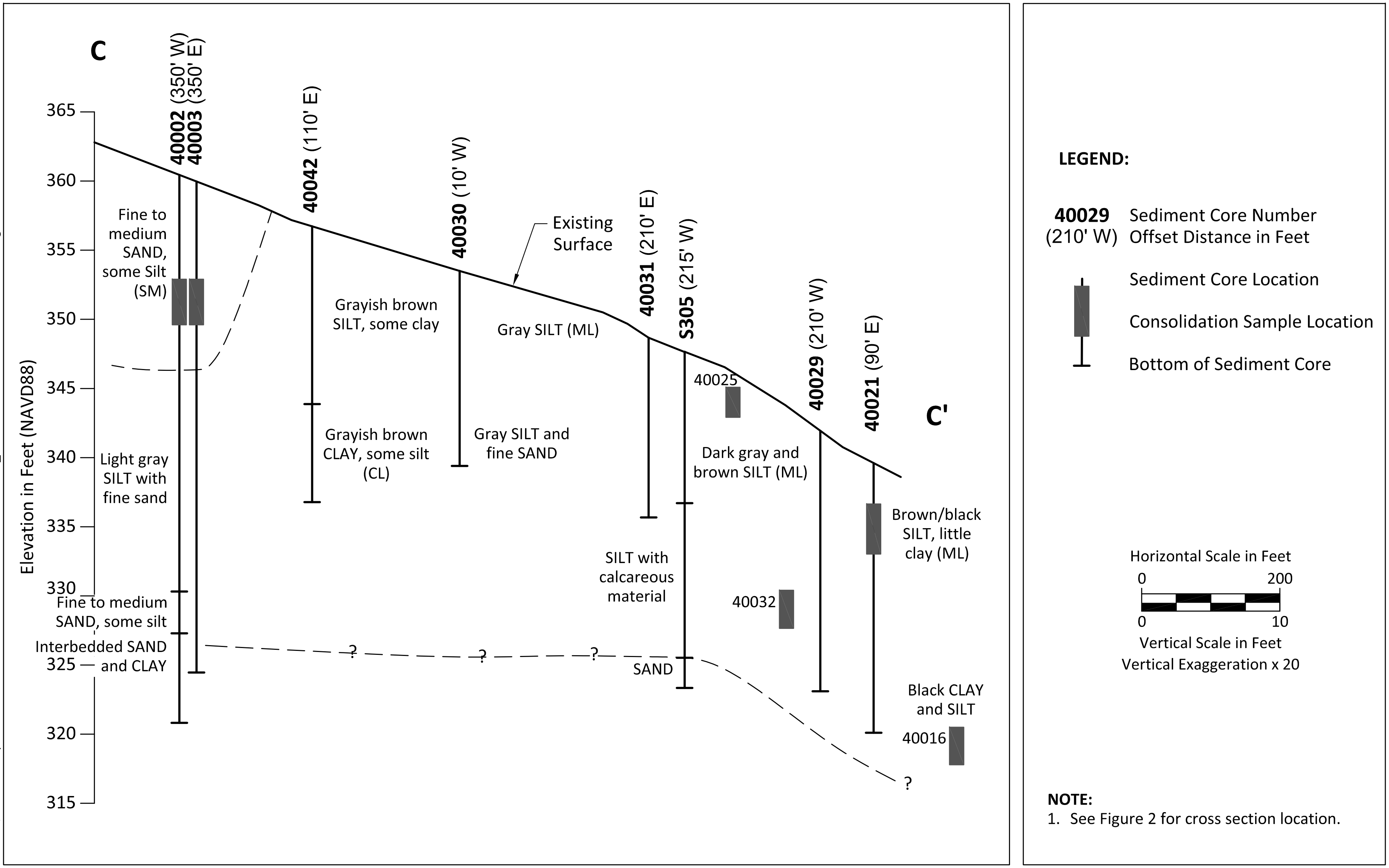


Figure 4
Typical Cross Section B-B' - Remediation Area A
Cap-Induced Settlement Evaluation
Onondaga Lake

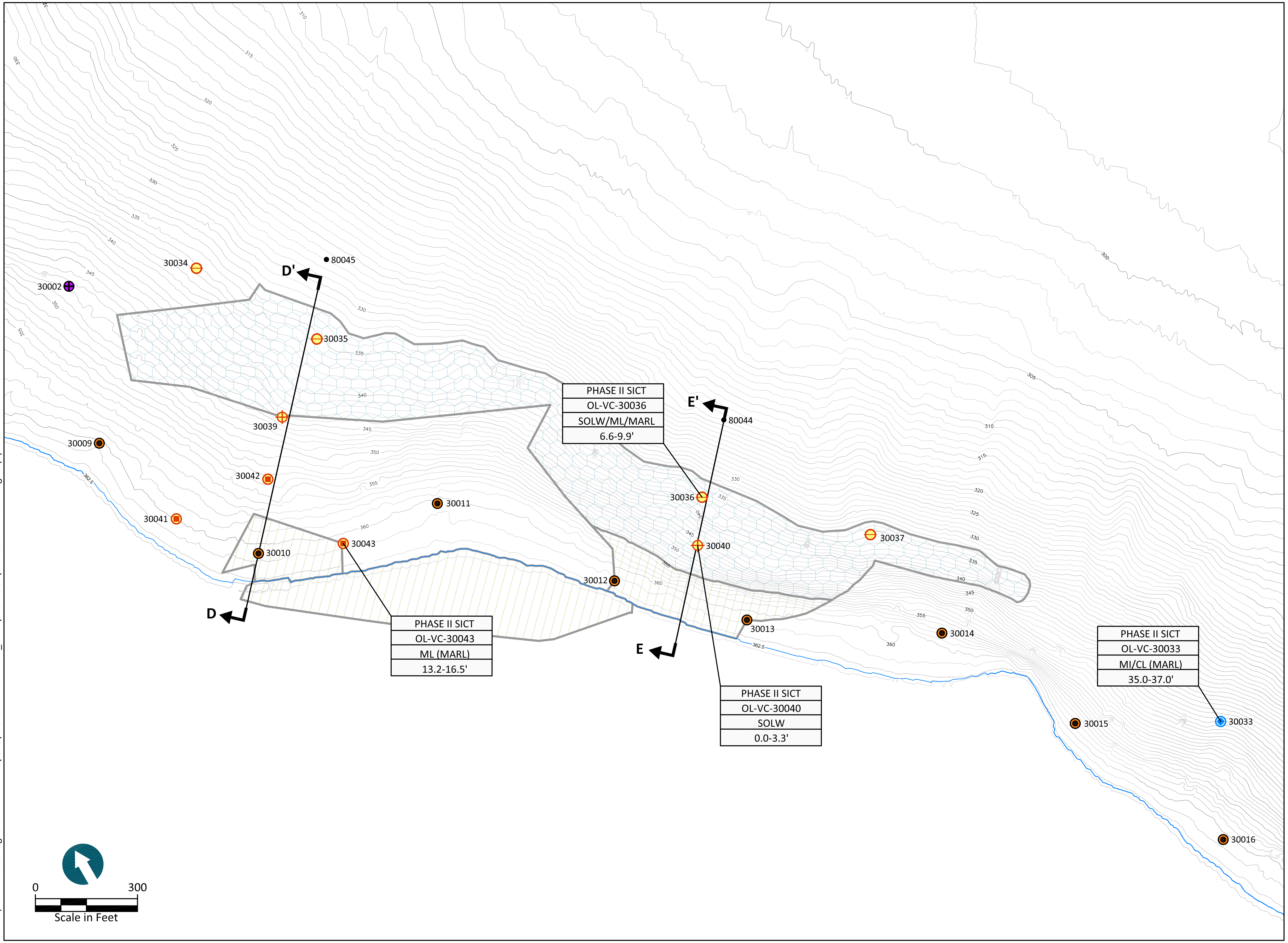


NOTE:

1. See Figure 2 for cross section location.

Figure 5
Typical Cross Section C-C' - Remediation Area A
Cap-Induced Settlement Evaluation
Onondaga Lake

ANCHOR QEA



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LEGEND:

340 Existing Bathymetric Contour in Feet

Dredge and Cap

Cap Only

B Cross Section Location and Designation

PHASE II SICT	Test Type
OL-VC-30036	Boring ID
SOLW/ML/MARL	Soil Type
6.6-9.9'	Sampling Depth

(SICT - Seepage-Induced Consolidation Test)

PHASE II PDI SAMPLE LOCATIONS

- 20 ft (6m) Core (Sample 0-0.5 ft and 0.5-3.3 ft)
- 20 ft (6m) Core (Sample on 3.3 ft intervals to 10 ft)
- 20 ft (6m) Core (Sample on 3.3 ft intervals to 20 ft)
- Deep Boring to Till/Top of Bedrock

PHASE I PDI SAMPLE LOCATIONS

- 13 ft (4m) Core and Surface Water Sample
- 33 ft (10m) Boring, 13 ft (4m) Core, Surfae Water Sample
- Vane Shear/Atterberg Limits and Surface Water Sample (No Chemical Analysis)

RI/FS LOCATIONS

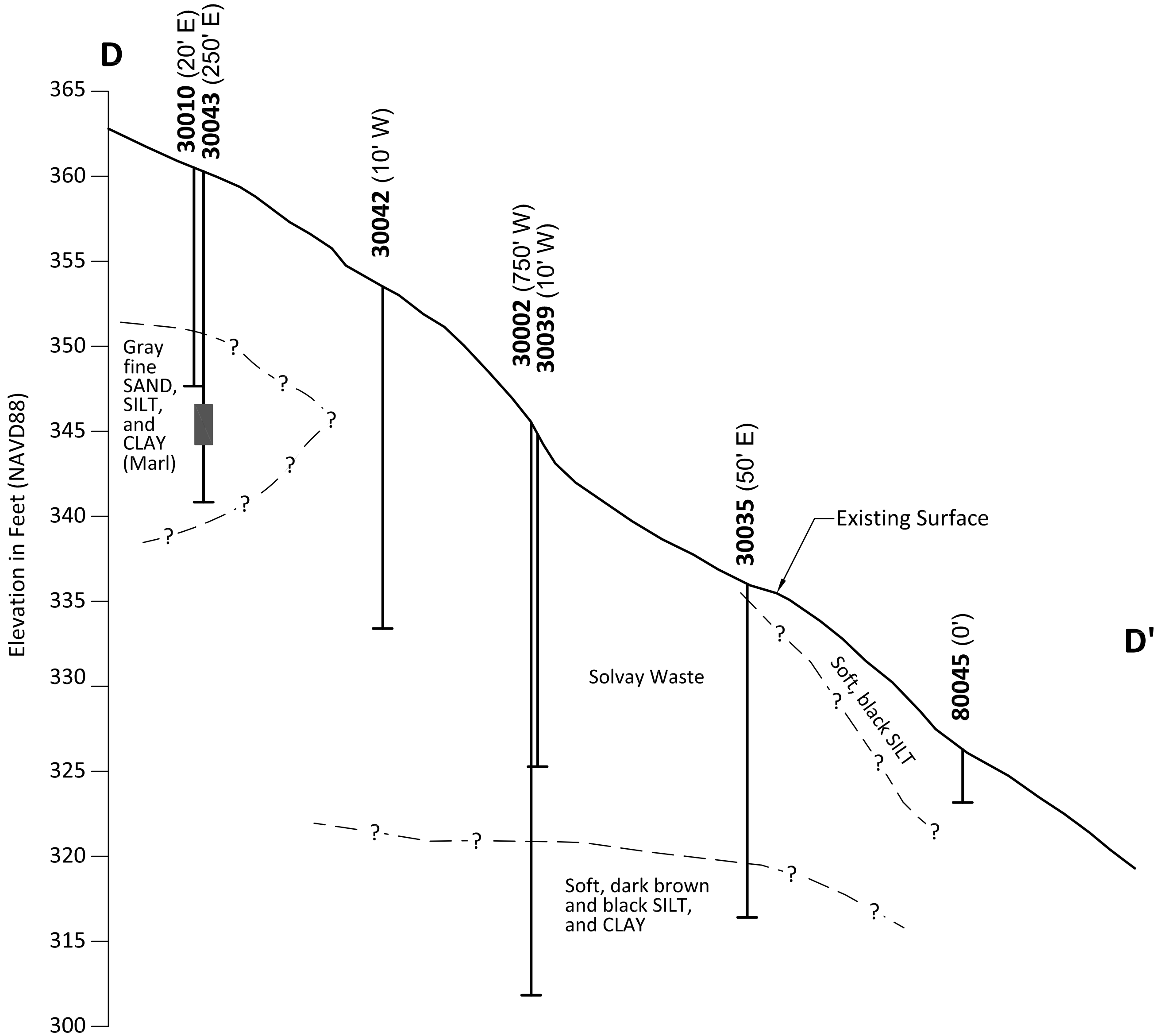
- 0.07-0.16 ft (0-5cm)
- 0.17-0.50 ft (5-15cm)
- 0.5-1.0 ft (15-30cm)
- 1.0-3.3 ft (30-100cm)
- 3.3-7.0 ft (1-2m)
- 7.0-13.0 ft (2-4m)
- 13.0-17.0 ft (4-5m)
- 17.0-26.0 ft (5-8m)

SOURCE:
1. Basemap provided to Anchor QEA by Parsons in September 2008.
2. All samples provided by Parsons, 2006.

VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88), U.S. Survey Feet.
HORIZONTAL DATUM: New York State Plane, Central Zone, North American Datum of 1983 (NAD83), U.S. Survey Feet.
BATHYMETRIC SURVEY: Performed by CR Environmental, Inc., for Honeywell in 2005.
NOTE:
All locations and features are approximate.

ANCHOR QEA

Figure 6
Plan View Map of Remediation Area B
Cap-Induced Settlement Evaluation
Onondaga Lake



LEGEND:

30035 Sediment Core Number
(50' E) Offset Distance in Feet

Sediment Core Location

Consolidation Sample Location

Bottom of Sediment Core

Horizontal Scale in Feet
0 200

0 10
Vertical Scale in Feet
Vertical Exaggeration x 20

NOTE:
1. See Figure 6 for cross section location.

Figure 7
Typical Cross Section D-D' - Remediation Area B
Cap-Induced Settlement Evaluation
Onondaga Lake

ANCHOR QEA

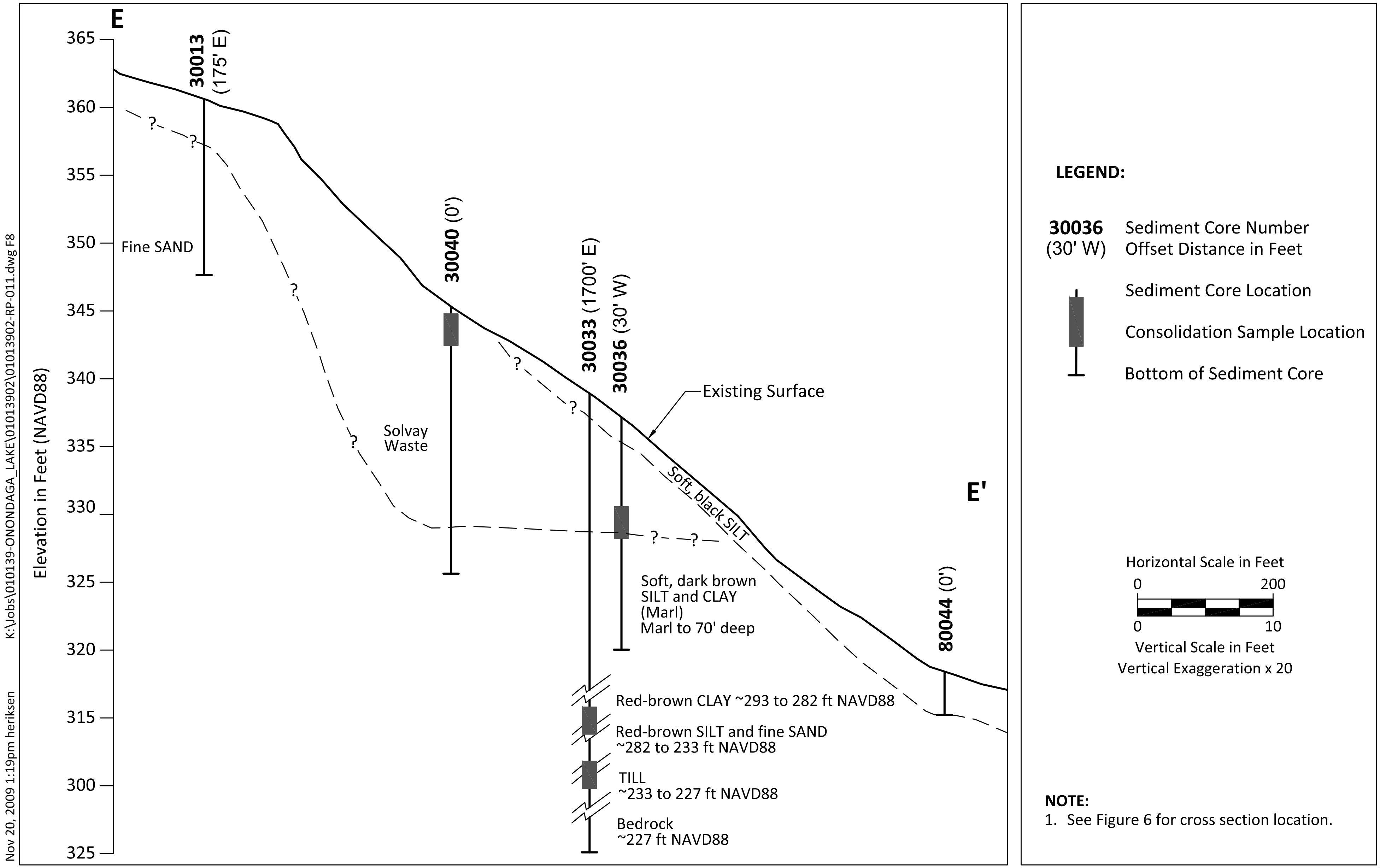
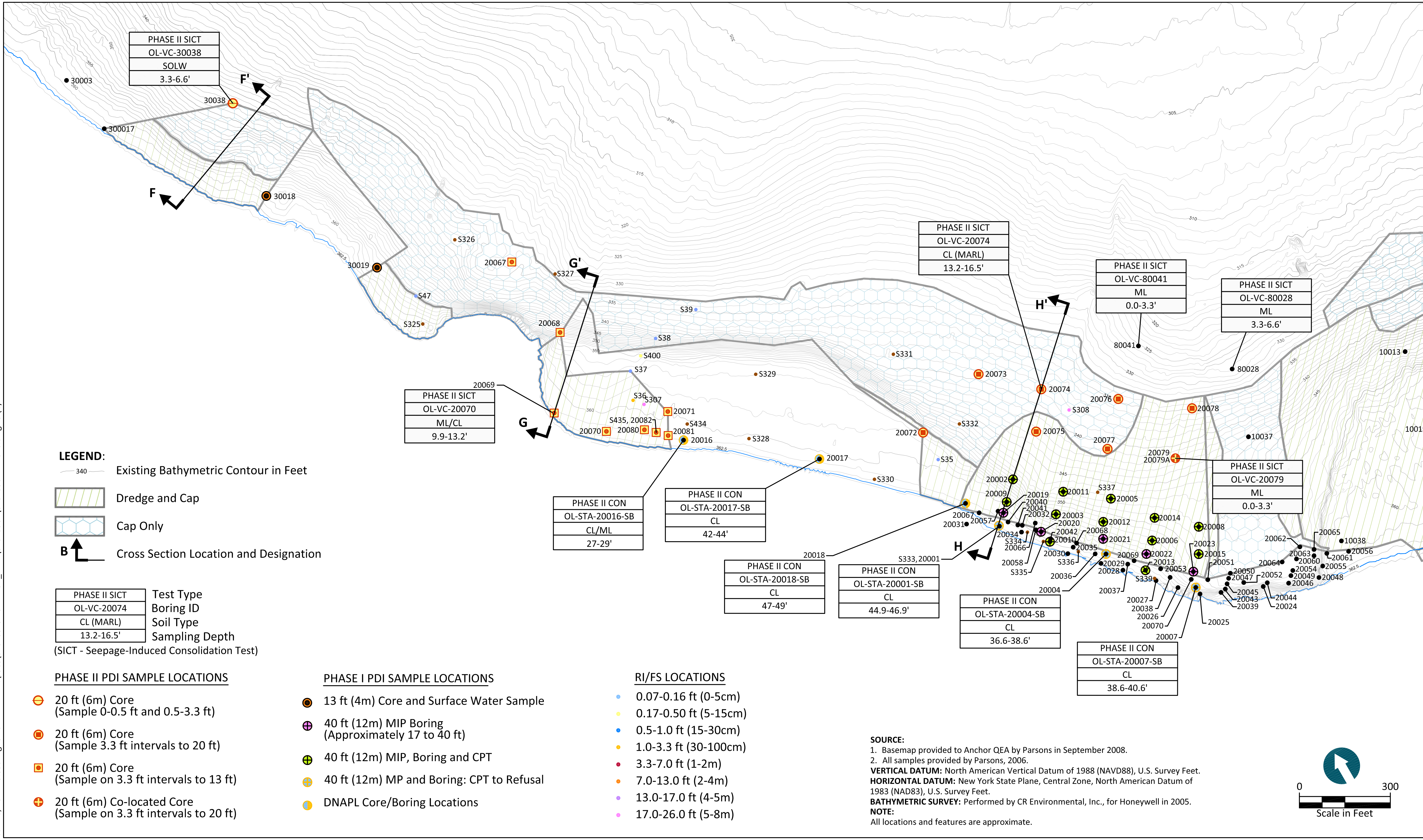


Figure 8
Typical Cross Section E-E' - Remediation Area B
Cap-Induced Settlement Evaluation
Onondaga Lake



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Jan 16, 2011 10:39am ghowell

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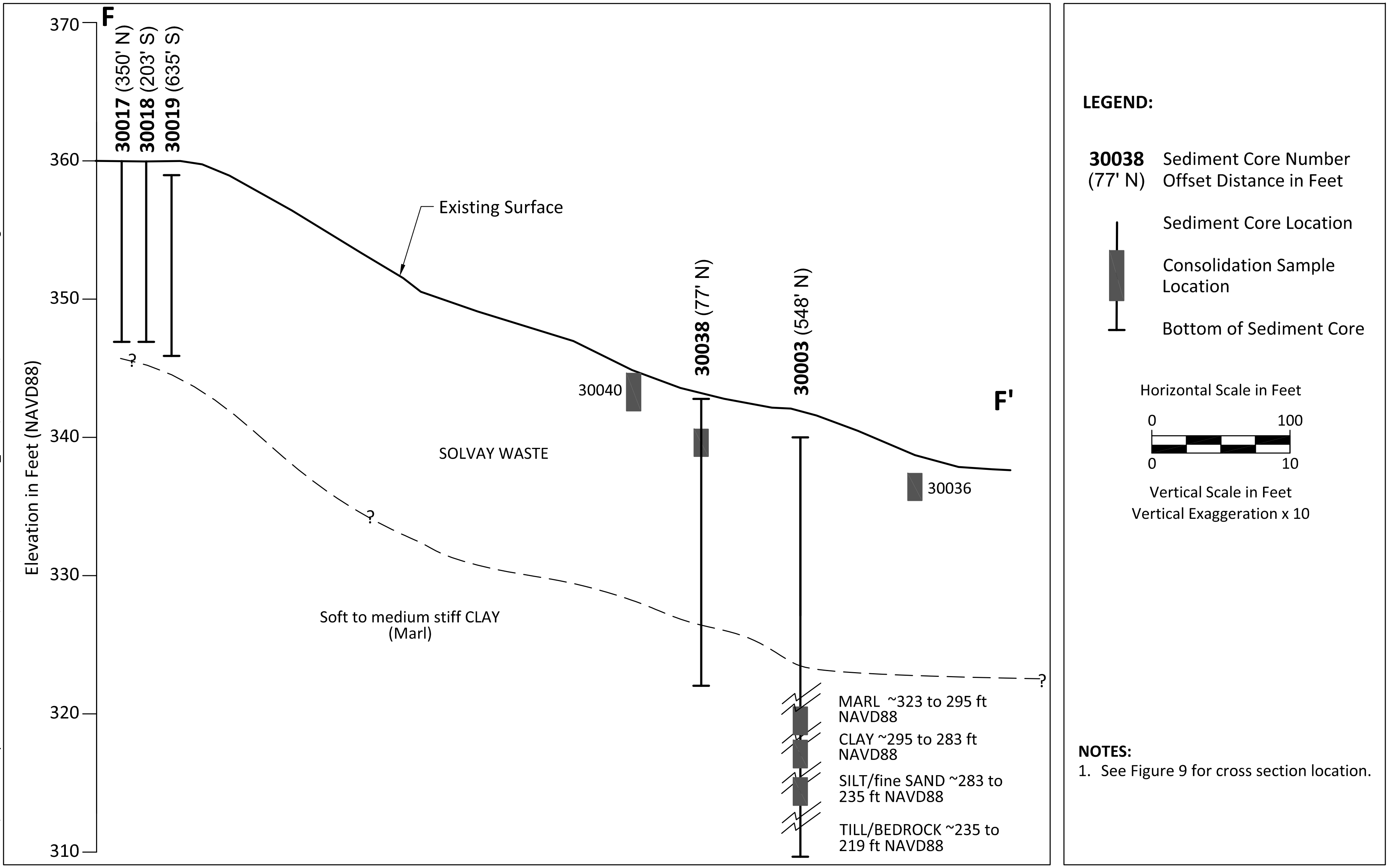
Figure 9
Plan View Map of Remediation Area C
Cap-Induced Settlement Evaluation
Onondaga Lake



NOTES:

1. See Figure 9 for cross section location.

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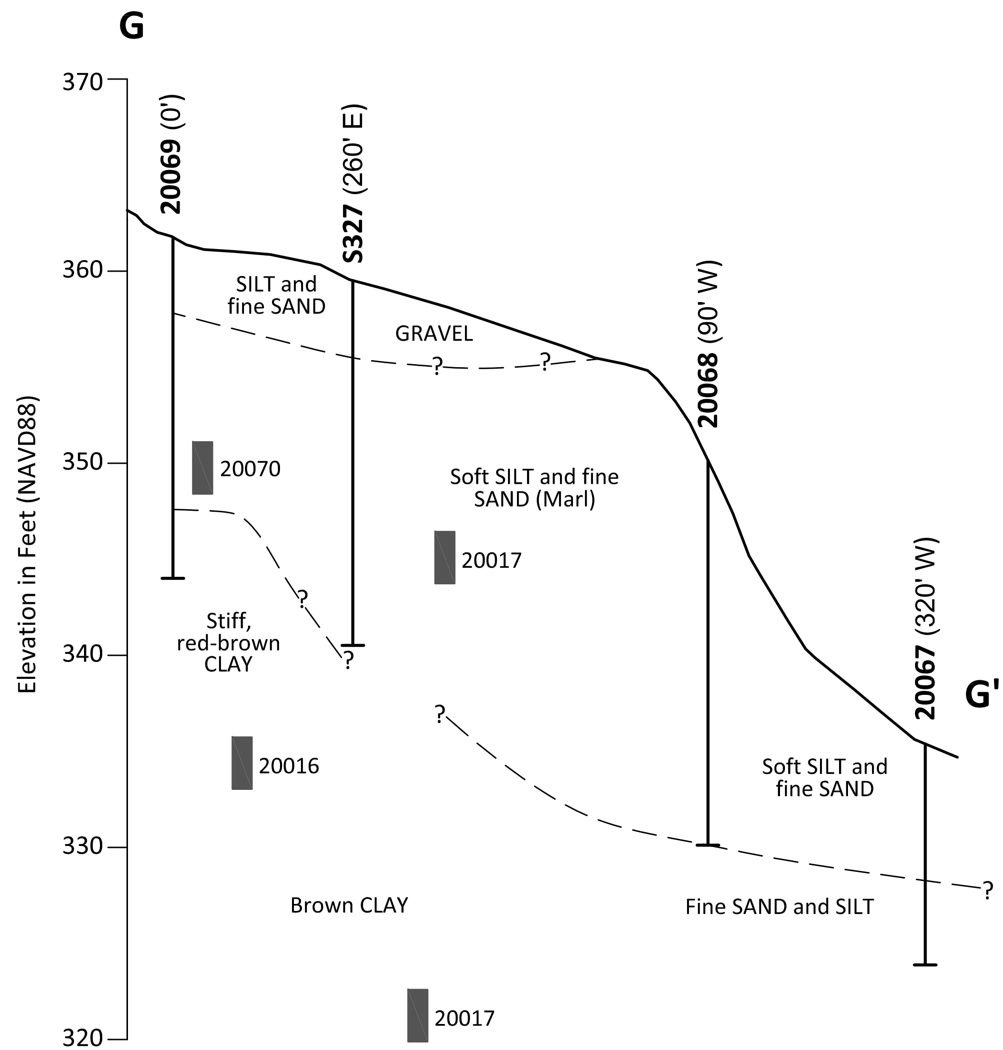
ANCHOR QEA

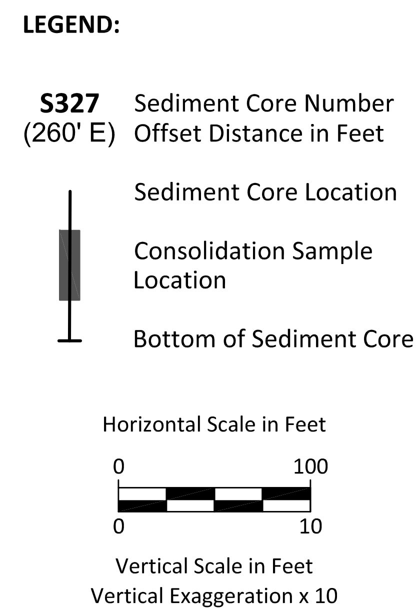
Figure 10

Typical Cross Section F-F' - Remediation Area C

Cap-Induced Settlement Evaluation

Onondaga Lake





NOTES:
1. See Figure 9 for cross section location.

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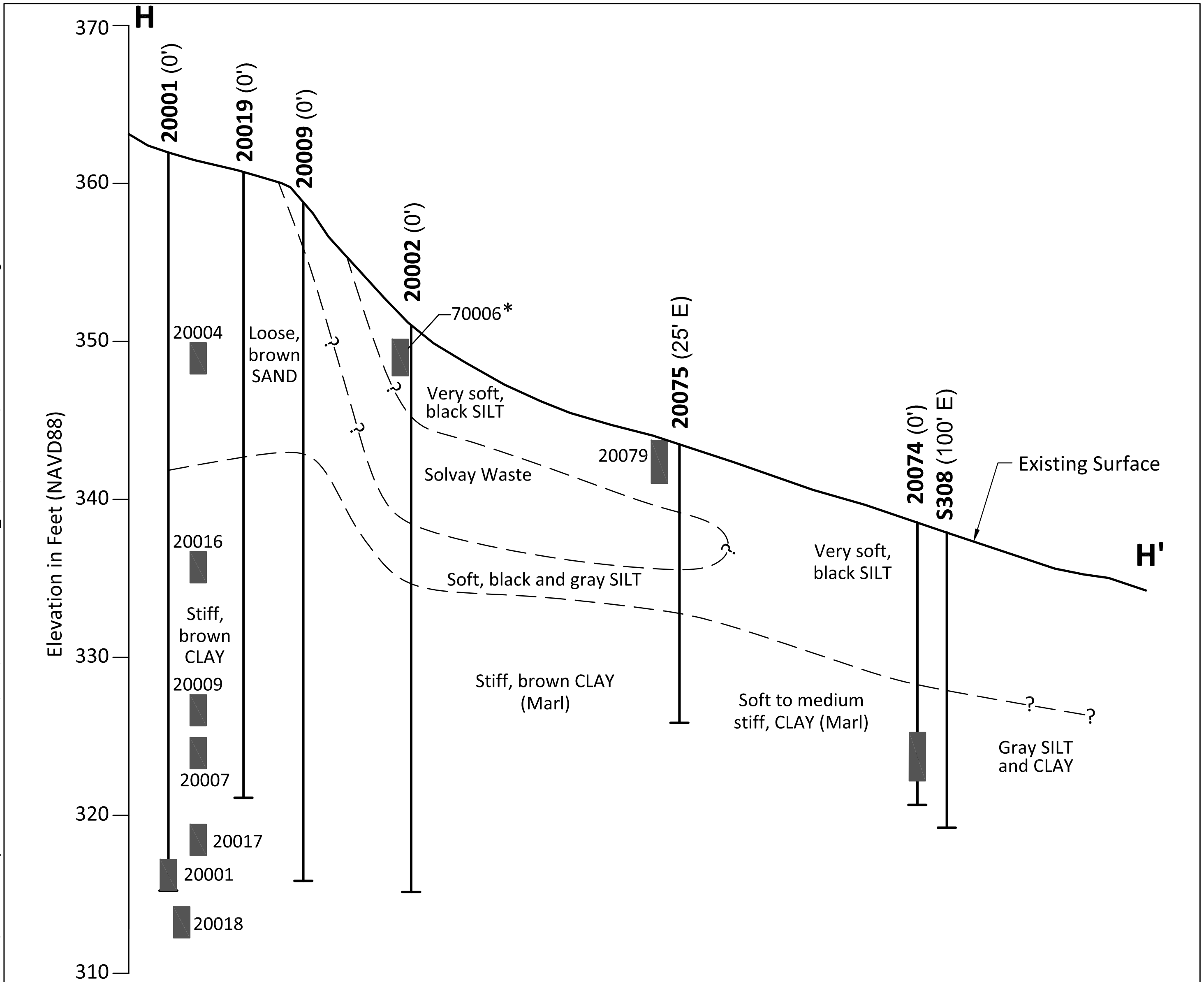
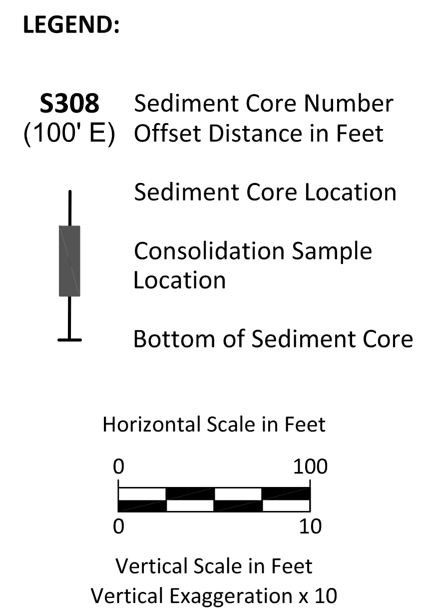
Nov 20, 2009 12:30pm heriksen

Figure 11
Typical Cross Section G-G' - Remediation Area C
Cap-Induced Settlement Evaluation
Onondaga Lake





NOTES:

1. See Figure 9 for cross section location.
2. Sand observed below CLAY (Marl) layer at 55' to 65' deep in borings 20016, 20017, and 20018.

* Comparable unit in Remediation Area E used for Remediation Area C estimate.

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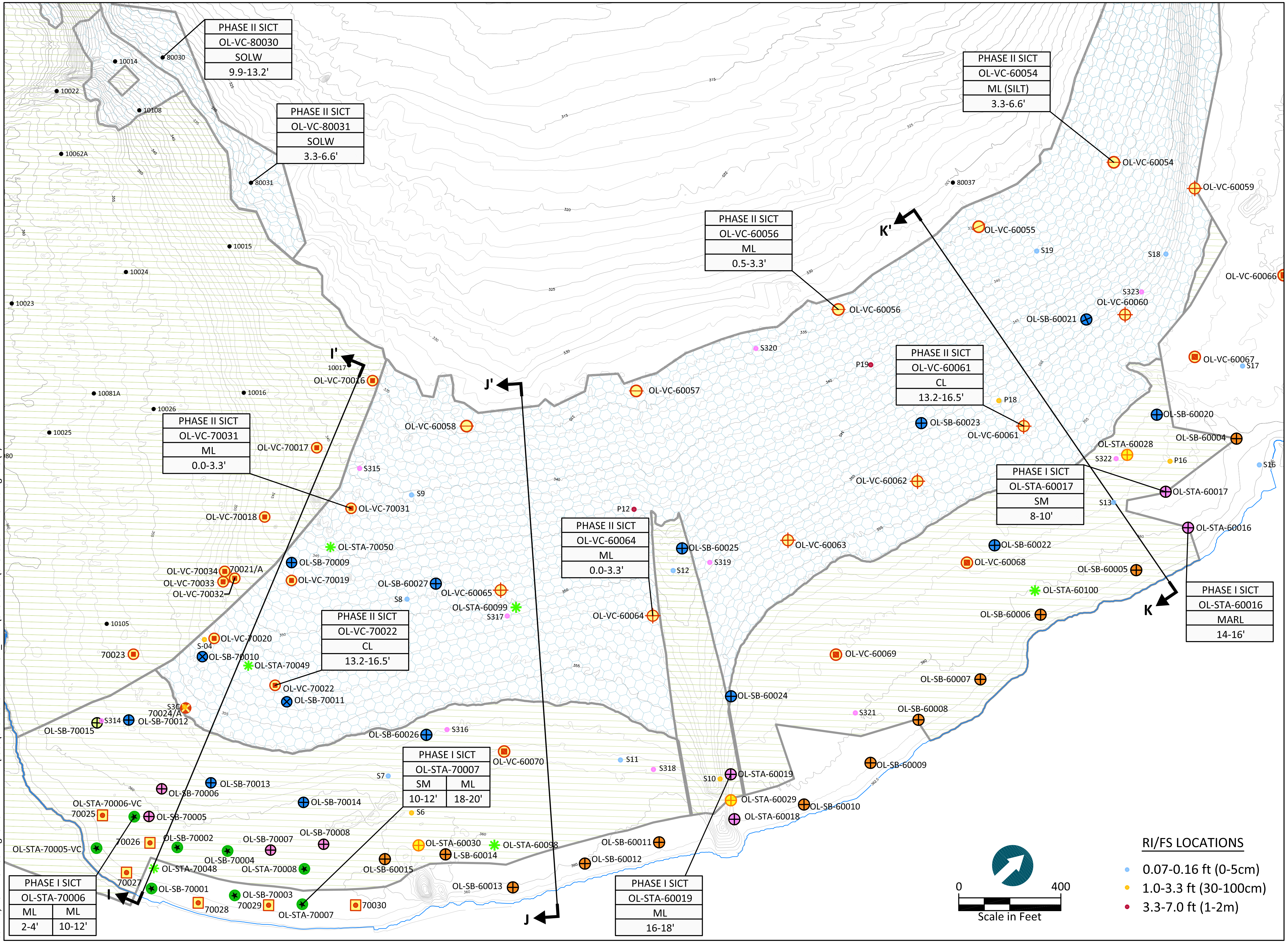
Nov 20, 2009 12:30pm heriksen

Figure 12
Typical Cross Section H-H' - Remediation Area C
Cap-Induced Settlement Evaluation
Onondaga Lake



LEGEND:

340 Existing Bathymetric Contour in Feet

Dredge and Cap

Cap Only

B Cross Section Location and Designation

PHASE II SICT	Test Type
OL-STA-40032	Boring ID
CL (MARL)	Soil Type
13.2-16.4'	Sampling Depth

(SICT - Seepage-Induced Consolidation Test)

PHASE II PDI SAMPLE LOCATIONS

- 20 ft (6m) Core (Sample 0-0.5 ft and 0.5-3.3 ft)
- 20 ft (6m) Core (Sample on 3.3 ft intervals to 10 ft)
- 20 ft (6m) Core (Sample on 3.3 ft intervals to 20 ft)
- 20 ft (6m) Co-located Core (Sample on 3.3 ft intervals to 20 ft)
- 20 ft (6m) Core (Sample 3.3 ft intervals to 13 ft)
- Bulk Density Sample

PHASE I PDI SAMPLE LOCATIONS

- 13 ft (4m) Core and Vane Shear/Atterberg Limits
- 33 ft (10m) Boring, 13 ft (4m) Core, Vane Shear/ Atterberg Limits and Porewater Samples (Groundwater Model)
- Vane Shear/Atterberg Limits (No Chemical Analysis)
- Bulk Sediment and Water Sample for Emissions, Column Settling, and Effluent Elutrite Testing (3 Locations, 1 Composite)
- Bulk Sediment Sample for Emissions and Odor Testing
- 20 Ft (6m) Core

SOURCE:
1. Basemap provided to Anchor QEA by Parsons in September 2008.
2. All samples provided by Parsons, 2006.

VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88), U.S. Survey Feet.
HORIZONTAL DATUM: New York State Plane, Central Zone, North American Datum of 1983 (NAD83), U.S. Survey Feet.
BATHYMETRIC SURVEY: Performed by CR Environmental, Inc., for Honeywell in 2005.
NOTE:
All locations and features are approximate.

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Jan 16, 2011 10:40am ghowell

ANCHOR QEA

Figure 13
Plan View Map of Remediation Area E
Cap-Induced Settlement Evaluation
Onondaga Lake

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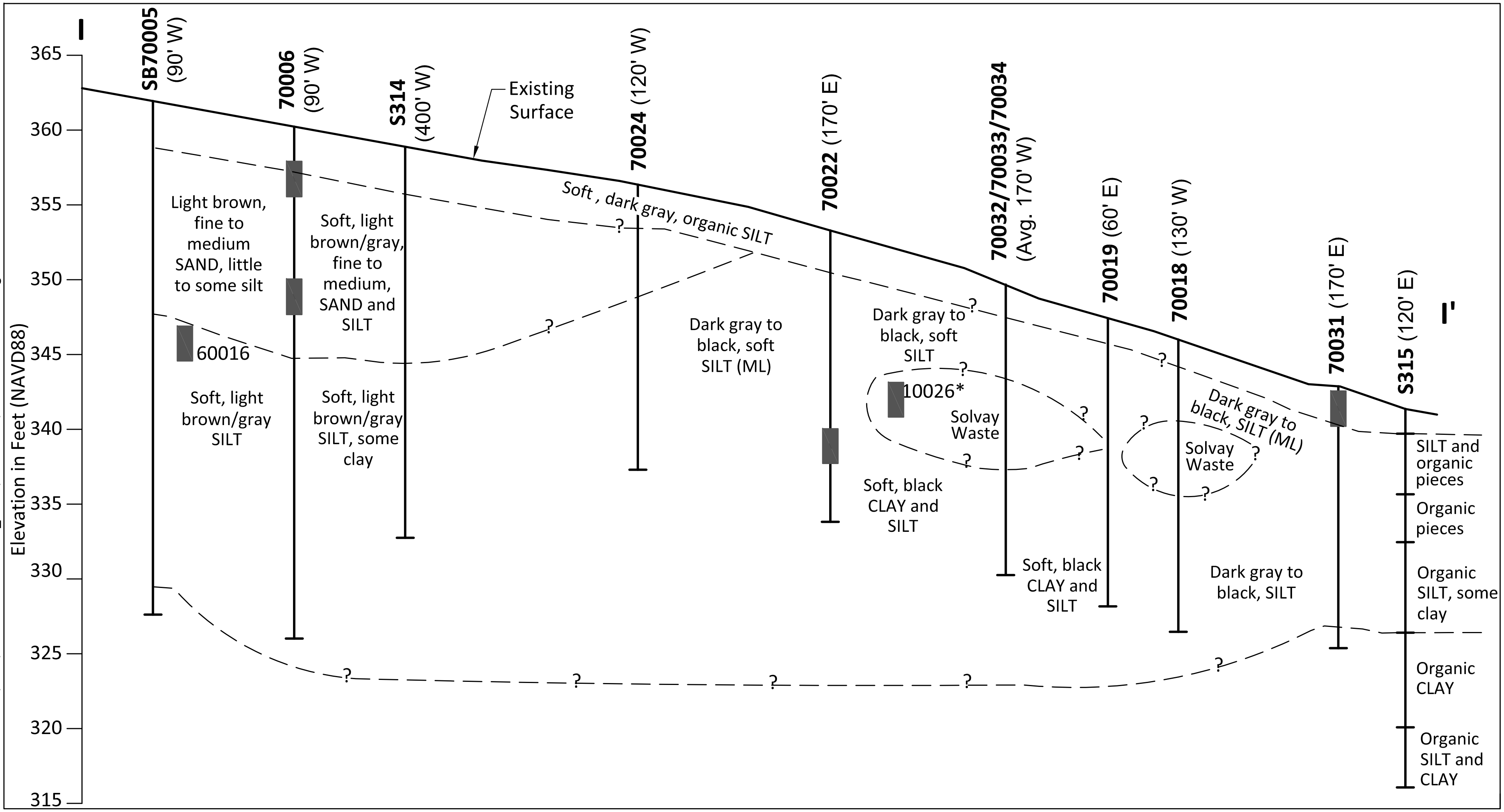
Nov 20, 2009 12:35pm heriksen



LEGEND:

70006 Sediment Core Number
(90' W) Offset Distance in Feet

Sediment Core Location

Consolidation Sample Location

Bottom of Sediment Core

Horizontal Scale in Feet: 0 – 200

Vertical Scale in Feet: 0 – 10

Vertical Exaggeration x 20

NOTES:

1. See Figure 14 for cross section location.

* Comparable unit in Remediation Area D used for Remediation Area E estimate. Also used 10080, 10081, and 10105.

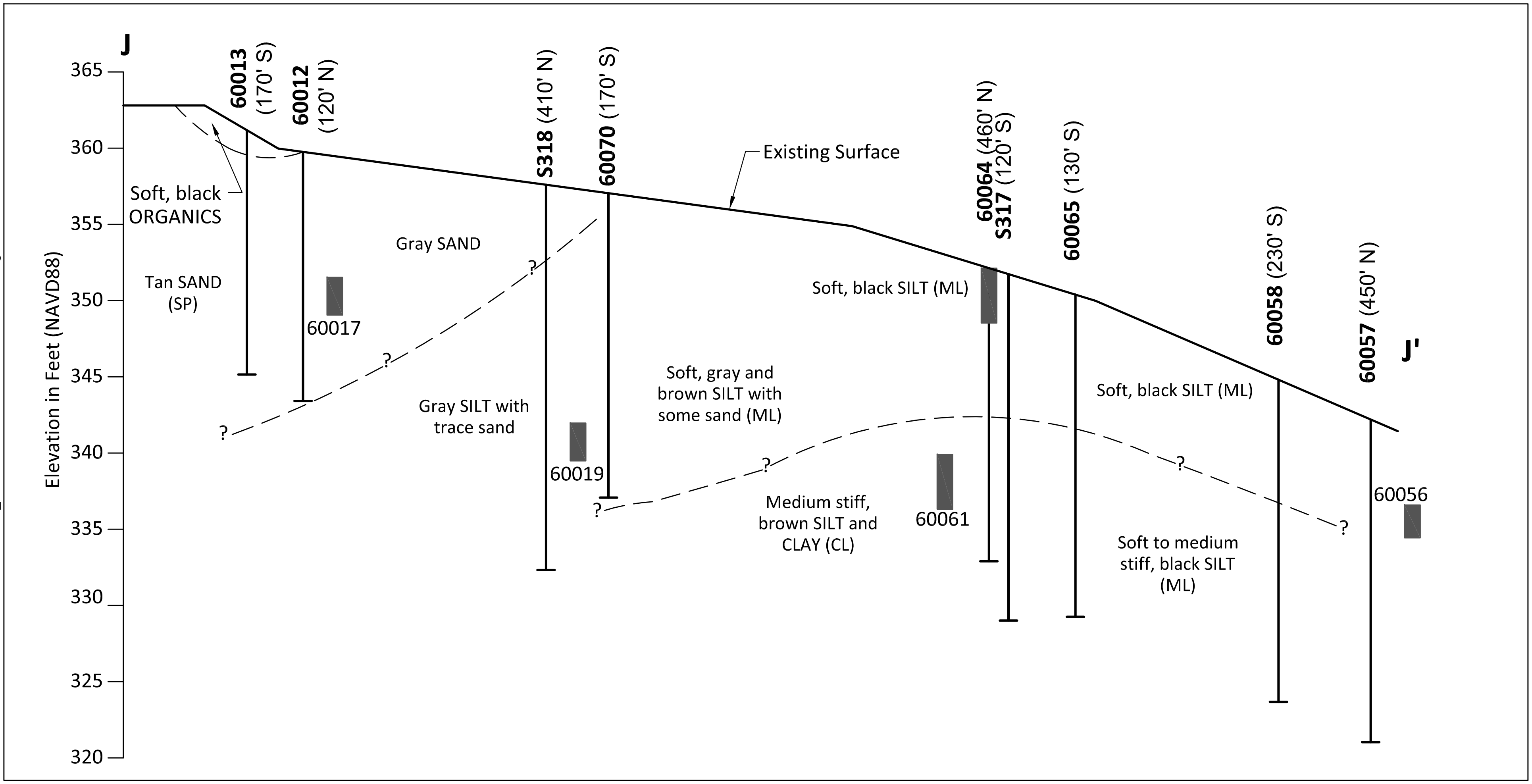
ANCHOR QEA

Figure 14

Typical Cross Section I-I' - Remediation Area E

Cap-Induced Settlement Evaluation

Onondaga Lake



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Nov 20, 2009 12:57pm heriksen

LEGEND:

60065 Sediment Core Number
(130' S) Offset Distance in Feet

Sediment Core Location

Consolidation Sample Location

Bottom of Sediment Core

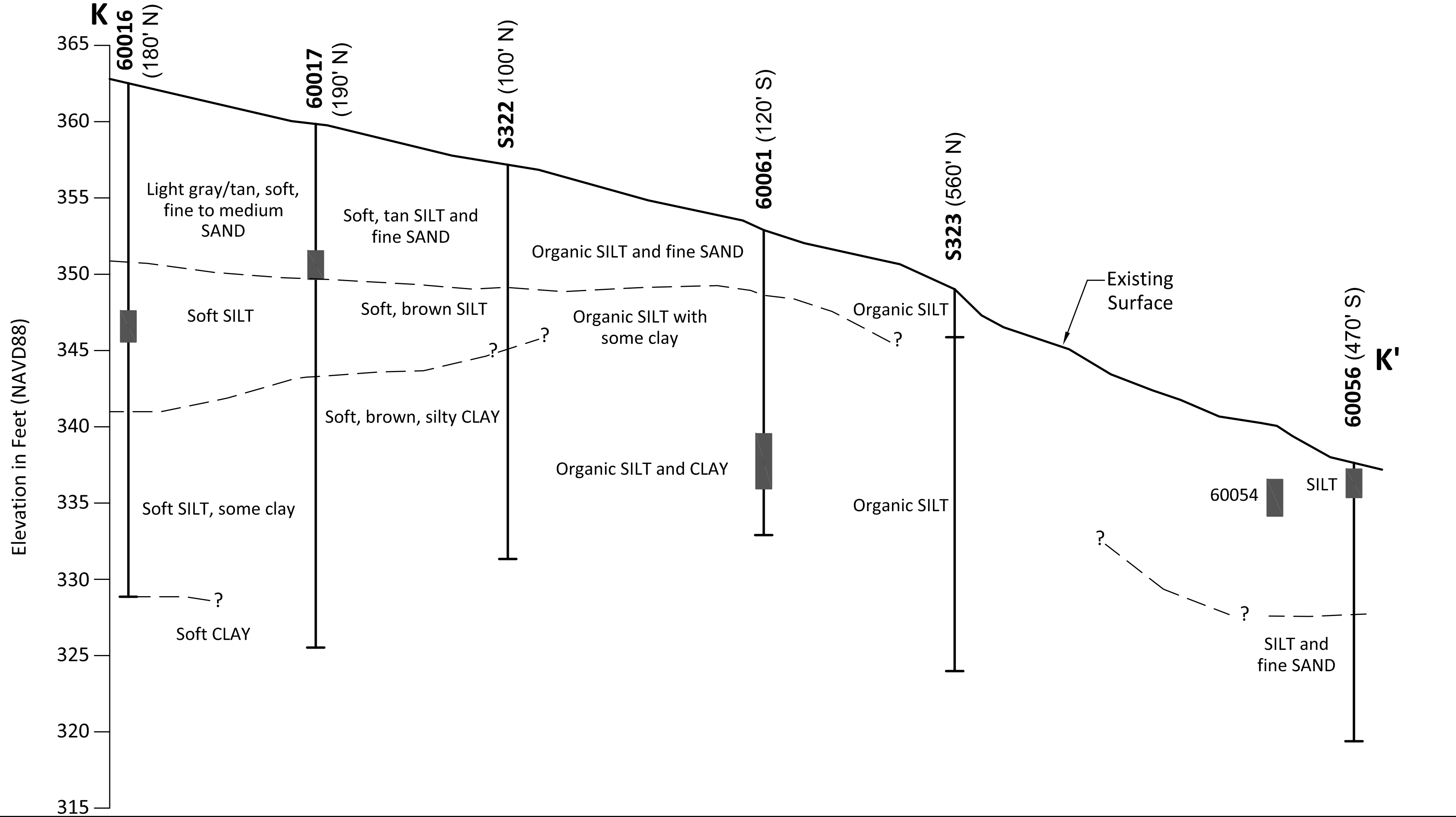
Horizontal Scale in Feet
0 200

0 10
Vertical Scale in Feet
Vertical Exaggeration x 20

NOTE:
1. See Figure 13 for cross section location.

Figure 15
Typical Cross Section J-J' - Remediation Area E
Cap-Induced Settlement Evaluation
Onondaga Lake

ANCHOR QEA



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Nov 20, 2009 1:00pm heriksen

LEGEND:

60017 Sediment Core Number
(190' N) Offset Distance in Feet

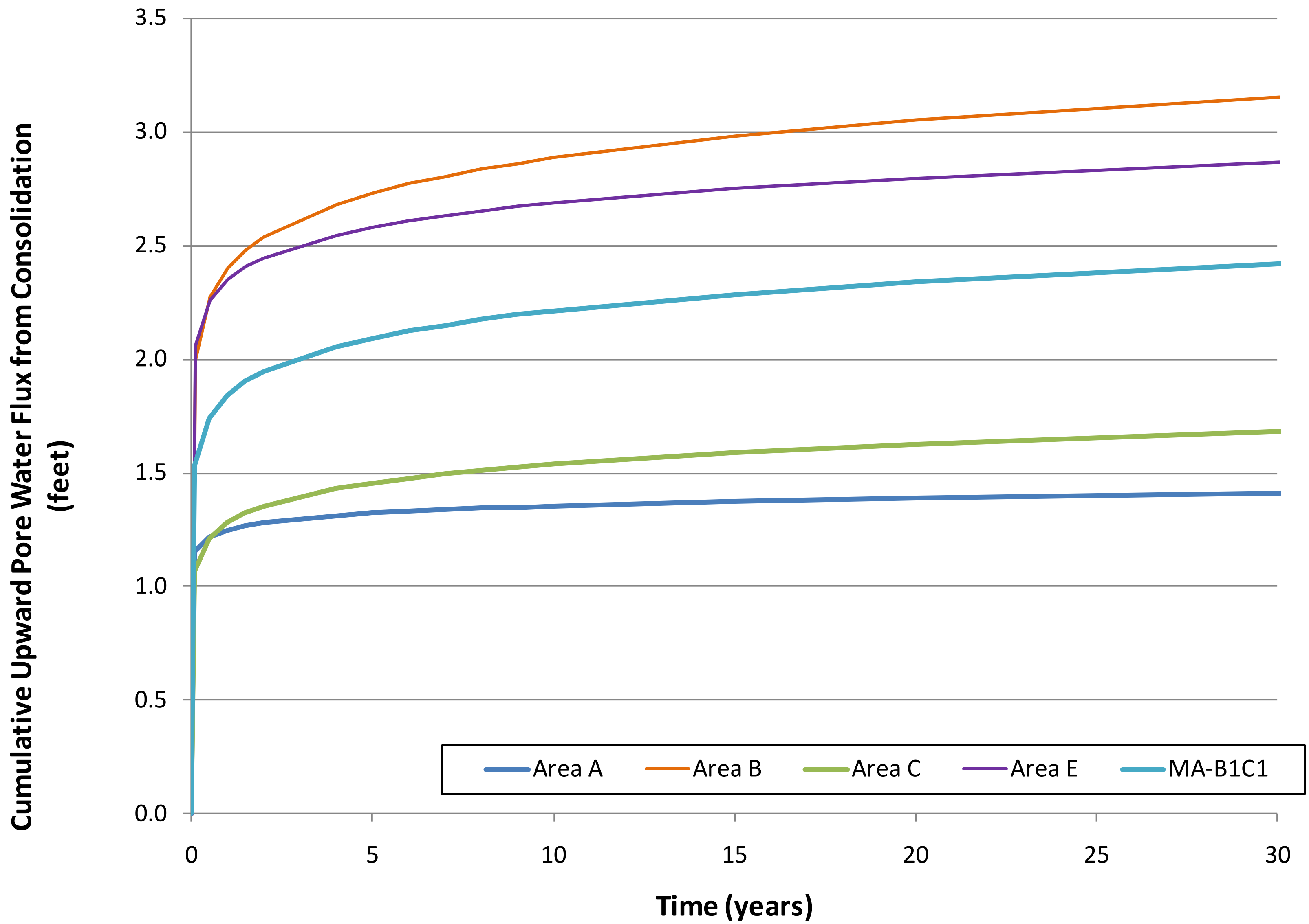
Sediment Core Location
Consolidation Sample Location
Bottom of Sediment Core

Horizontal Scale in Feet: 0 – 200
Vertical Scale in Feet: 0 – 10
Vertical Exaggeration x 20

NOTE:
1. See Figure 13 for cross section location.

ANCHOR QEA

Figure 16
Typical Cross Section K-K' - Remediation Area E
Cap-Induced Settlement Evaluation
Onondaga Lake



ANCHOR QEA

Figure 17
Cumulative Porewater Expression for Cap Modeling
Cap-Induced Settlement Evaluation
Onondaga Lake

Attachments provided on CD
at end of appendix

ATTACHMENT A
CONSOLIDATION TEST DATA SUMMARY

Attachment A - Consolidation Data Summary - SIC Test

Location ID	Field Sample ID	Sample Depth	Remediation Area	Soil Stratum	Initial Void Ratio (e_o)	SICT Parameters					Boring/Coring Log Description		Water Content (ASTM D2216)	Atterberg Limits (ASTM D 4318)			Grain Size (ASTM D 422)					Specific Gravity (ASTM D 854)	Soil Classification	Calculated Bulk Density
						A	B	Z	C	D				Liquid Limit	Plastic Limit	Plasticity Index	Percent Gravel	Percent Sand	Percent Fines (clay & silt)	Clay-sized Particle Content (0.005 mm)	Clay-sized Particle Content (0.002 mm)			
		[ft]			[-]	[-]	[-]	[kPa]	[m/sec]	[-]			[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[-]		[pcf]
OL-VC-70022	OL-0297-04	13.2'-16.5'	E	Clay and Silt	5.52	3.28	-0.146	0.028	2.30E-10	4.82	Wet to moist, soft, black, CLAY and SILT, slight petroleum odor, moderate plasticity, one inch long wood fragment at 36 inches.	CL	84	71	36	35	0	3	97	20	16	2.58	MH	93.5
OL-VC-60061	OL-0298-03	13.2' - 16.5'	E	Clay and Silt, Organic Silt, Medium Stiff Clay	5.30	3.46	-0.178	0.091	4.80E-10	4.17	Moist, soft, medium stiff, dark gray to dark brown CLAY, some silt, trace fine sand, moderate to high plasticity, light brown poorly sorted fine sand seam at 37 inches, 1 inch thick piece of wood at 23 inches and wood fragments throughout.	CL	80	75	41	34	0	15.5	84.5	29	19	-	MH	94.3
OL-STA-40001	OL-0113-01	6.6'-9.9'	A	Fine to Medium Sand	2.58	2.11	-0.117	0.179	1.00E-08	3.61	Wet, loose, gray fine SAND, little shells, little fines, sulfur odor.	SM	53	36	26	10	0	23.2	76.8	14	10	2.65	ML	105.2
OL-STA-40002	OL-0113-02	9.9'-13.2'	A	Fine to Medium Sand	3.33	3.86	-0.209	2.005	1.30E-09	5.33	Wet, soft, tan/gray, FM SAND, little to some silt, trace clay	SP	-	-	-	-	-	-	-	-	-	-	-	-
OL-STA-40003	OL-0113-03	9.9'-13.2'	A	Fine to Medium Sand	3.66	4.47	-0.242	2.27	7.50E-10	3.32	Wet, soft, gray FM SAND, little to some silt. Bottom 1 ft is wet, soft, brown SILT and clay	SP	65	59	35	24	0	16.3	83.7	32	19	2.58	MH	99.2
OL-VC-20074	OL-0297-01	13.2'-16.5'	C	Marl	6.05	3.51	-0.13	0.015	1.90E-10	3.56	Moist, soft to medium stiff, gray CLAY, some to little silt, moderate plasticity, trace shells, sulfur odor (MARL)	CL (Marl)	71	77	36	41	0	1	99	70	45	2.69	MH	98.6
OL-VC-30043	OL-0302-05	13.2'-16.5'	B	Marl	5.30	3.3	-0.149	0.041	2.50E-09	4.11	Wet, soft, gray SILT, little clay, little fine sand, little shells, trace organics, low plasticity, sulfur odor (MARL)	ML (Marl)	0.76	62	38	24	0	0.255	0.745	-	-	2.45	MH	94.0
OL-VC-40016	OL-0302-06	13.2'-16.5'	A	Marl	5.91	3.73	-0.184	0.082	2.50E-10	3.09	Moist, brown, soft CLAY, some silt, trace shells, moderate plasticity (MARL)	CL (Marl)	80	86	39	47	0	0.6	99.4	72	48	-	MH	94.3
OL-VC-40032	OL-0302-09	13.2'-16.5'	A	Marl	5.97	3.88	-0.167	0.076	8.00E-11	5.17	Moist, stiff, brown CLAY, little silt, trace organics, trace shells, slight decomposing odor, high plasticity	CL (Marl)	-				0	17.3	82.7	28	23	2.53	N/A	157.9
OL-STA-30033	OL-0298-01	35.0' - 37.0'	C	Marl	4.78	4.95	-0.247	1.153	2.00E-09	2.49	Wet, very soft, dark gray to black SILT and CLAY, slight sulfur odor, medium plasticity	MI/CL (Marl)	0.73	63	36	27	0	0.004	0.996	-	-	2.74	MH	98.6
OL-VC-30036	OL-0302-02	6.6'-9.9'	B	Marl, Solvay Waste	8.90	4.92	-0.149	0.018	1.80E-10	4.19	0-27 inches is wet, soft to stiff grayish-green to bluish-green silt-like grains, trace fine sand mothball and ammonia odor (SOLW). 27 in to 31 inches is wet, soft, black SILT, little fine sand, slight mothball odor (ML). 31 inches is wet, soft, black SILT, little fine sand, slight mothball odor (ML). 31 inches to rest of core is wet, soft, dark brown silt and clay, moderate plasticity, trace shells, sulfur odor (MARL)	SOLW/ML/ MARL	-	-	-	-	-	-	-	-	-	-	-	-
OL-STA-70006	OL-0112-04	2'-4'	C, E	Organic Silt	2.67	2.64	-0.194	0.943	6.90E-09	4.05	Boring: Wet, soft, black F SAND, some Silt Core: Wet, soft, black SILT, trace F Sand	ML	61	58	33	25	0.3	26.2	73.5	26	16	2.52	MH	99.8
OL-VC-20079	OL-0297-02	0.0'-3.3'	B, C	Organic Silt	4.34	4.17	-0.205	0.823	7.90E-09	2.29	Wet, very soft, black to dark gray SILT, trace organics, petroleum-like odor	ML	105	55	36	19	0	0.7	99.3	11	7	2.58	MH	89.0
OL-VC-70031	OL-0297-03	0.0'- 3.3'	E	Organic Silt	7.22	4.7	-0.194	0.109	8.10E-11	3.74	Wet, very soft to soft, black SILT, trace clay, trace fine sand, organic odor	ML	131	103	45	58	0	2.2	97.8	29	19	-	MH	84.7
OL-STA-60016	OL-0112-01	14'-16'	E	Organic Silt, Soft Silt	3.00	3.49	-0.195	2.19	5.30E-09	3.34	Wet, light gray SILT and F Sand (Marl)	Marl	-	-	-	-	-	-	-	-	-	-	-	-
OL-VC-40021	OL-0302-07	3.3'-6.6'	A	Silt	3.81	2.64	-0.146	0.081	2.40E-09	3.28	Wet, soft, grayish brown and black, little clay, trace organics, low plasticity, trace fine angular gravel	ML (Silt)	73	53	29	24	0	1.2	98.8	45	24	2.67	CH	97.7
OL-VC-40025	OL-0302-08	3.3'-6.6'	A	Silt	4.84	3.76	-0.099	0.077	3.90E-09	3.63	Wet, very soft, dark gray SILT, trace clay, trace organics, ammonia-like odor	ML	103	57	36	21	0	0.5	99.5	18	11	-	MH	89.1
OL-VC-40034	OL-0302-10	16.5'-17.8'	A	Silt	3.32	2.29	-0.127	0.054	1.60E-09	3.44	Wet, soft, grayish-brown, SILT, little clay, little fine sand, trace organics, slight sulfur odor, trace shells (MARL)	ML (Marl)	69	44	28	16	0	24.3	75.7	44	33	-	ML	97.6
OL-STA-60017	OL-0112-03	8'-10'	E	Silt and Fine Sand	3.11	2.85	-0.134	0.524	2.00E-09	3.71	Wet, soft, tan SILT and F Sand	SM	74	53	34	19	0	11.2	88.8	22	14	2.61	MH	96.7
OL-STA-70006	OL-0112-05	10'-12'	E	Silt and Fine Sand	3.51	2.74	-0.091	0.065	5.60E-09	3.25	Boring: Wet, soft, tan/lt gray SILT, some F SAND Core: Wet, loose, lt brown F SAND, trace fines	ML	-	-	-	-	-	-	-	-	-	-	-	-
OL-VC-60054	OL-0298-04	3.3' - 6.6'	E	Silt and Fine Sand	6.69	4.13	-0.218	0.11	1.70E-10	3.67	Wet, soft, black SILT, some clay, trace fine sand, low plasticity, strong petroleum odor	ML (Silt)	135	90	40	50	0	4.2	95.8	22	18	-	MH	84.2
OL-STA-60019	OL-0112-02	16'-18'	E	Soft Silt	3.32	4.31	-0.239	2.98	2.00E-09	2.85	Wet, soft, brown SILT, little F Sand	ML	-	-	-	-	-	-	-	-	-	-	-	-
OL-VC-60064	OL-0298-06	0.0' – 3.3'	E	Soft Silt	4.56	3.1	-0.17	0.031	3.10E-10	3.9	Wet, soft, black, SILT, little to some clay, low plasticity, trace fine sand, trace organics, petroleum-like odor.	ML	94	74	37	37	0	8.9	91.1	28	20	2.53	MH	90.7
OL-VC-20070	OL-0302-01	9.9'-13.2'	C	Soft Silt and Clay	2.66	1.77	-0.137	0.051	1.70E-08	2.65	0 to 11 inches is wet, soft, gray SILT, little clay, trace fine sand, 11 inches to 26 inches is moist, dense, gray to red-brown, fine SAND and SILT, black organic discoloration at 22 inches. Rest of core is moist, stiff, red-brown, CLAY, some silt, high plasticity	ML/CL	0.48	42	26	16	0.005	0.168	0.827	-	-	-	ML	0.0
OL-VC-60056	OL-0298-02	0.5' - 3.3'	E	Soft Silt, and Silt and Fine Sand	6.09	4.15	-0.202	0.15	1.70E-10	3.79	Wet, soft, black SILT, some clay, little fine sand, low plasticity	ML	143	95	36	59	0	1.3	98.7	29	19	-	CH	83.3
OL-STA-10026-VC	OL-0119-03	3.3'-6.6'	E	Solvay Waste	12.34	4.68	-0.087	0.00001	4.00E-10	4.55	Wet, stiff, gray to light gray, very coarse sandstone-like grains (SOLW)	SOLW	0.89	69	45	24	0	0.553	0.447	-	-	-	SM	#REF!
OL-VC-10080	OL-0296-04	9.9'-13.2'	E	Solvay Waste	9.38	8.5	-0.114	0.424	1.80E-10	4.44	Wet, soft to medium stiff, gray white, silt-like grains, trace fine sand in top half of core, tan discoloration in top 2 inches of core, mothball odor.	SOLW	-	-	-	-	-	-	-	-	-	-	-	-
OL-VC-10081A	OL-0296-05	13.2'-16.5'	E	Solvay Waste	13.49	8.19	-0.104	0.008	1.30E-11	5.2	Wet, medium stiff to hard, silt-like grains, little fine sand, black fine sand seam at 36 inches, mothball odor.	SOLW	1.66	117	82	35	0.048	0.071	0.881	-	-	2.58	MH	81.1
OL-VC-10105	OL-0296-06	0-3.3'	E	Solvay Waste	8.68	6.62	-0.104	0.073	4.90E-10	4.4	0 to 5 inches is wet, soft, blue gray, wilt-like grains. Rest of core is wet, soft, gray, silt-like grains, trace fine sand, 12-inch thick Solvay chunks in lower half of core, moth ball odor.	SOLW	1.62	89	55	34	0	0.117	0.883	-	-	2.6	MH	81.6
OL-VC-30040	OL-0302-04	0.0'-3.3'	B	Solvay Waste	10.50	7.23	-0.114	0.039	9.60E-12	6.33	Wet, soft, grayish-green to grayish-white, silt-like grains, trace fine sand, mothball odor.	SOLW	1.27	90	52	38	0	0.016	0.984	-	-	2.18	MH	81.9

Attachment A - Consolidation Data Summary - Oedometer Test

Location ID	Field Sample ID	Sample Depth [ft]	Remediation Area	Soil Stratum	Compression Index (C_c) [-]	Recompression Index (C_r) [-]	Initial Void Ratio (e_o) [-]	Preconsolidation Pressure [tsf]	Coefficient of Consolidation (C_v) [1] [in^2/sec]	Water Content (ASTM D2216) [%]	Atterberg Limits (ASTM D 4318)			Grain Size (ASTM D 422)					Specific Gravity (ASTM D 854) [-]	Soil Classification	Bulk Density (ASTM D 2937) [pcf]	Organic Content (ASTM D 2974) (%)	Carbonate Content (ASTM D 4373) (%)
											Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	Percent Gravel [%]	Percent Sand [%]	Percent Fines (clay & silt) [%]	Clay-sized Particle Content (0.005 mm) [%]	Clay-sized Particle Content (0.002 mm) [%]					
OL-STA-10013	OL-0110-05	41-43	B	Brown Silt (Marl)	0.51	0.06	1.60	0.6	3E-04	79	83	35	48	0	0.3	99.7	-	-	2.61	CH	99	3.1	
OL-STA-10018	OL-0110-27	48-50	B	Brown Silt (Marl)	0.36	0.03	1.06	0.7	5E-04	34	33	18	15	0	0.5	99.5	-	-	2.79	CL	114	0.6	9
OL-STA-10022	OL-0110-49	64-66	B	Brown Silt (Marl)	0.70	0.06	1.85	0.8	8E-04	60	66	32	34	0	0.1	99.9	-	-		CH	-		
OL-STA-10024	OL-0052-12	64-66	B	Brown Silt (Marl)	0.57	0.09	1.81	0.6	2E-04	70	90	40	50	0	1.2	98.8	-	-	2.66	MH	97.9	6.8	48
OL-STA-10025	OL-0052-16	52-54	B	Brown Silt (Marl)	0.65	0.08	1.88	0.7	3E-04	67	94	38	56	0	0.5	99.5	-	-	2.61	CH	98	3.6	43
OL-STA-10026	OL-0052-22	50-52	B	Brown Silt (Marl)	0.69	0.09	1.99	0.7	1E-04	71	90	41	49	0	0.3	99.7	-	-	2.59	MH	96.4	5.7	43
OL-STA-30033	-	47-49	B, C	Marl	0.40	-	1.23	-	2E-07	-	-	-	-	-	-	-	-	-	-	ML	-	-	-
OL-STA-30033	-	51-53	B, C	Marl	0.16	-	0.70	-	8E-04	-	-	-	-	-	-	-	-	-	-	ML	-	-	-
OL-STA-20016	OL-0110-52	27-29	C	Brown Clay	0.19	0.04	0.89	0.4	3E-04	29	NP			0.1	0.2	99.7	-	-	2.75	ML	-		
OL-STA-20017	OL-0110-57	10-12	C	Soft Silt and Clay	0.51	0.01	1.42	0.4	3E-04	79	NP			0	15.7	84.3	-	-	2.67	ML	-	3	
OL-STA-20004	OL-0072-01	12-14	C	Clay and Silt	0.72	0.01	2.91	0.3	4E-03	108	77	51	26	0	2.6	97.4	43	30	-	MH	89.4	4.8	87
OL-STA-20001	OL-0072-09	44.9-46.9	C	Red/Brown Clay and Silt	0.26	0.04	0.95	0.5	2E-04	29	27	16	11	0	0.1	99.9	50	35	-	CL	122	1	78
OL-STA-20004	OL-0072-02	36.6-38.6	C	Red/Brown Clay and Silt	0.16	0.02	0.90	0.4	4E-04	27	26	14	12	0	0.6	99.4	46	34	-	CL	121	1.3	78
OL-STA-20007	OL-0072-05	38.6-40.6	C	Red/Brown Clay and Silt	0.49	0.05	1.33	0.5	1E-04	67	67	38	29	0	1.4	98.6	58	39	-	MH	106	2.5	9
OL-STA-20016	OL-0110-52	27-29	C	Red/Brown Clay and Silt	0.19	0.04	0.89	0.4	3E-04	29	Non-Plastic			0.1	0.2	99.7	11	8	2.75	ML	-	-	-
OL-STA-20017	OL-0110-59	42-44	C	Red/Brown Clay and Silt	0.22	0.03	0.87	0.6	1E-06	28	23	13	10	0	0.1	99.9	50	35	-	CL	127	-	-
OL-STA-20018	OL-0110-55	47-49	C	Red/Brown Clay and Silt	0.23	0.02	0.91	0.7	6E-04	33	35	16	19	0.1	0.3	99.6	53	36	-	CL	-	-	-

Notes:

1. Estimated average for range of stress induced during testing.

ATTACHMENT B
SETTLEMENT CALCULATIONS

See Attached MS Excel Files

ATTACHMENT C
SUMMARY OF MODELING INPUTS AND RESULTS

Attachment C
Table 1 - Summary of Geologic Sections For Consolidation Estimates

Remediation Area	Habitat Module	Cross Section	Case	Dredge Depth [ft]	Cap Thickness [ft]	Sediment Units	Sample Location (depth) for Consolidation Parameters	SICT Parameters					Oedometer Parameters			Thickness (ft)	Buoyant Weight (pcf)	Predicted Primary Consolidation (in)	Predicted Secondary Consolidation (in)	Predicted Total Consolidation (in)	Percent Consolidation			Time after Cap Placement		
								A	B	Z	C	D	Cc	eo	$C_{\alpha e}$						vs. Time [yrs]			vs. Amount of Consolidation (in)		
								[-]	[-]	[kPa]	[m/sec]	[-]									50%	75%	90%	0.5 yr	2 yr	10 yr
A	1 (-20 to -30 ft)	C-C'	1	0	2.25	SILT	40021 (3.3-6.6')	2.64	-0.146	0.081	2.40E-09	3.28			0.008	15	35.3	12	4	16	<0.1	0.2	0.7	87%	98%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	10	31.9									
			2	0	2.25	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	10	5	15	<0.1	<0.1	0.36	92%	97%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	10	31.9									
			3	0	2.25	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	10	5	15	<0.1	<0.1	0.16	95%	100%	100%
						Marl	40032 (13.2-16.5')	3.88	-0.167	0.076	8.00E-11	5.17			0.008	10	35.2									
			4	0	2.25	SILT	40034 (16.5-17.8')	2.29	-0.127	0.054	1.60E-09	3.44			0.007	25	35.2	12	4	16	<0.1	0.5	1.5	75%	93%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
			5	0	2.25	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	25	26.7	14	5	19	<0.1	<0.1	0.5	90%	95%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
		B-B'	1	0	2.25	SILT	40034 (16.5-17.8')	2.29	-0.127	0.054	1.60E-09	3.44			0.007	25	35.2	12	4	16	<0.1	0.5	1.5	75%	93%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
			2	0	2.25	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	25	26.7	14	5	19	<0.1	<0.1	0.5	90%	95%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
		A-A'	1	0	2.25	SILT	40021 (3.3-6.6')	2.64	-0.146	0.081	2.40E-09	3.28			0.008	15	35.3	12	4	16	<0.1	0.2	0.7	87%	98%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	10	31.9									
			2	0	2.25	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	10	4	14	<0.1	<0.1	0.36	92%	97%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	10	31.9									
			3	0	2.25	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	10	5	15	<0.1	<0.1	0.16	95%	100%	100%
						Marl	40032 (13.2-16.5')	3.88	-0.167	0.076	8.00E-11	5.17			0.008	10	35.2									
	2A (-7 to -20 ft)	A-A'	1	0	3.75	SILT	40021 (3.3-6.6')	2.64	-0.146	0.081	2.40E-09	3.28			0.008	15	35.3	17	4	21	<0.1	0.2	0.7	87%	98%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	10	31.9									
			2	0	3.75	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	14	4	18	<0.1	<0.1	0.4	91%	97%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	10	31.9									
			3	0	3.75	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	14	4	18	<0.1	<0.1	0.2	95%	99%	100%
						Marl	40032 (13.2-16.5')	3.88	-0.167	0.076	8.00E-11	5.17			0.008	10	35.2									
		B-B'	1	0	3.75	SILT	40034 (16.5-17.8')	2.29	-0.127	0.054	1.60E-09	3.44			0.007	25	35.2	17	4	21	0.1	0.6	1.5	74%	92%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
			2	0	3.75	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	25	26.7	20	5	25	<0.1	<0.1	0.5	89%	95%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
		C-C'	1	0	2.75	SILT	40021 (3.3-6.6')	2.64	-0.146	0.081	2.40E-09	3.28			0.008	15	35.3	14	4	18	<0.1	0.2	0.7	87%	98%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	10	31.9									
			2	0	2.75	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	11	4	15	<0.1	<0.1	0.4	91%	97%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	10	31.9									
			3	0	2.75	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	11	5	16	<0.1	<0.1	0.2	95%	99%	100%
						Marl	40032 (13.2-16.5')	3.88	-0.167	0.076	8.00E-11	5.17			0.008	10	35.2									
			4	0	2.75	SILT	40034 (16.5-17.8')	2.29	-0.127	0.054	1.60E-09	3.44			0.007	25	35.2	14	4	18	0.1	0.6	1.5	74%	92%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
			5	0	2.75	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	25	26.7	16	5	21	<0.1	<0.1	0.5	89%	95%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
	3A (-3 to -7 ft)	C-C'	1	0.5 to 1.25	3.75	SILT	40021 (3.3-6.6')	2.64	-0.146	0.081	2.40E-09	3.28			0.008	15	35.3	15 to 16	4	19 to 20	<0.1	0.2	0.7	88%	98%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	10	31.9									
			2	0.5 to 1.25	3.75	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	12 to 13	4	16 to 17	<0.1	<0.1	0.3	92%	98%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	10	31.9									
			3	0.5 to 1.25	3.75	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	12 to 13	5	17 to 18	<0.1	<0.1	0.1	96%	100%	100%
						Marl	40032 (13.2-16.5')	3.88	-0.167	0.076	8.00E-11	5.17			0.008	10	35.2									
			4	0.5 to 1.25	3.75	SILT	40034 (16.5-17.8')	2.29	-0.127	0.054	1.60E-09	3.44			0.007	25	35.2	14 to 16	4	18 to 20	<0.1	0.4	1.4	76%	93%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	15	31.9									
			5	0.5 to 1.25	3.75	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	25	26.7	17 to 19	5	22 to 24	<0.1	<0.1	0.5	90%	95%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
		A-A'	1	0.75 to 1.5	4.25	SILT	40021 (3.3-6.6')	2.64	-0.146	0.081	2.40E-09	3.28			0.008	15	35.3	16 to 17	4	20 to 21	<0.1	0.2	0.7	87%	98%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	10	31.9									
			2	0.75 to 1.5	4.25	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	13 to 14	4	17 to 18	<0.1	<0.1	0.4	91%	97%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	10	31.9									
			3	0.75 to 1.5	4.25	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	13 to 14	4	17 to 18	<0.1	<0.1	0.1	95%	99%	100%
						Marl	40032 (13.2-16.5')	3.88	-0.167	0.076	8.00E-11	5.17			0.008	10	35.2									
		B-B'	1	0.5 to 5	4.25	SILT	40034 (16.5-17.8')	2.29	-0.127	0.054	1.60E-09	3.44			0.007	25	35.2	7 to 18	5	12 to 23	0.1	0.6	1.6	74%	92%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	15	31.9									
			2	0.5 to 5	4.25	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	25	26.7	12 to 21	6	18 to 27	<0.1	<0.1	0.7	89%	95%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
	3A (-2 to -3 ft)	C-C'	1	0.5 to 1.25	5	SILT	40021 (3.3-6.6')	2.64	-0.146	0.081	2.40E-09	3.28			0.008	15	35.3	18 to 19	4	22 to 23	<0.1	0.2	0.7	87%	98%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	10	31.9									
			2	0.5 to 1.25	5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	15 to 16	4	19 to 20	<0.1	<0.1	0.4	92%	97%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	10	31.9									
			3	0.5 to 1.25	5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	15 to 16	4	19 to 20	<0.1	<0.1	0.2	95%	99%	100%
						Marl	40032 (13.2-16.5')	3.88	-0.167	0.076	8.00E-11	5.17			0.008	10	35.2									
			4	0.5 to 1.25	5	SILT	40034 (16.5-17.8')	2.29	-0.127	0.054	1.60E-09	3.44			0.007	25	35.2	18 to 20	4	22 to 24	0.1	0.5	1.6	75%	93%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	15	31.9									
			5	0.5 to 1.25	5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	25	26.7	22 to 23	5	27 to 28	<0.1	<0.1	0.6	89%	95%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
		A-A'	1	0.75 to 1.5	5	SILT	40021 (3.3-6.6')	2.64	-0.146	0.081	2.40E-09	3.28			0.008	15	35.3	18 to 19	4	22 to 23	<0.1	0.2	0.7	87%	98%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	10	31.9									
			2	0.75 to 1.5	5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	15 to 16	4	19 to 20	<0.1	<0.1	0.4	91%	97%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	10	31.9									
			3	0.75 to 1.5	5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	15 to 16	4	19 to 20	<0.1	<0.1	0.2	95%	99%	100%
						Marl	40032 (13.2-16.5')	3.88	-0.167	0.076	8.00E-11	5.17			0.008	10	35.2									
		B-B'	1	4 to 4.5	5	SILT	40034 (16.5-17.8')	2.29	-0.127	0.054	1.60E-09	3.44			0.007	25	35.2	12 to 13	4	16 to 17	0.1	0.5	1.6	74%	92%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	15	31.9									

Attachment C

Table 1 - Summary of Geologic Sections For Consolidation Estimates

Remediation Area	Habitat Module	Cross Section	Case	Dredge Depth [ft]	Cap Thickness [ft]	Sediment Units	Sample Location (depth) for Consolidation Parameters	SICT Parameters					Oedometer Parameters			Thickness (ft)	Buoyant Weight (pcf)	Predicted Primary Consolidation (in)	Predicted Secondary Consolidation (in)	Predicted Total Consolidation (in)	Percent Consolidation			Time after Cap Placement		
								A	B	Z	C	D	Cc	eo	$C_{\alpha\epsilon}$						vs. Time [yrs]			vs. Amount of Consolidation (in)		
								[-]	[-]	[kPa]	[m/sec]	[-]									50%	75%	90%	0.5 yr	2 yr	10 yr
			2	4 to 4.5	5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	25	26.7	16 to 17	5	21 to 22	<0.1	<0.1	0.6	89%	95%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
	5A-6A (-0.5 to -2 ft)	C-C'	1	0.5 to 1.25	5	SILT	40021 (3.3-6.6')	2.64	-0.146	0.081	2.40E-09	3.28			0.008	15	35.3	18 to 19	4	22 to 23	<0.1	0.2	0.7	87%	98%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	10	31.9									
			2	0.5 to 1.25	5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	15 to 16	4	19 to 20	<0.1	<0.1	0.4	91%	97%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	10	31.9									
			3	0.5 to 1.25	5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	15 to 16	4	19 to 20	<0.1	<0.1	0.2	95%	99%	100%
						Marl	40032 (13.2-16.5')	3.88	-0.167	0.076	8.00E-11	5.17			0.008	10	35.2									
			4	0.5 to 1.25	5	SILT	40034 (16.5-17.8')	2.29	-0.127	0.054	1.60E-09	3.44			0.007	25	35.2	18 to 20	4	22 to 24	0.1	0.6	1.6	74%	92%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	15	31.9									
			5	0.5 to 1.25	5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	25	26.7	22 to 23	5	27 to 28	<0.1	<0.1	0.7	89%	95%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
		A-A'	1	0.75 to 3	5.5	SILT	40021 (3.3-6.6')	2.64	-0.146	0.081	2.40E-09	3.28			0.008	15	35.3	17 to 20	4	21 to 24	<0.1	0.2	0.7	86%	97%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	10	31.9									
			2	0.75 to 3	5.5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	14 to 17	4	18 to 21	<0.1	<0.1	0.6	91%	97%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	10	31.9									
			3	0.75 to 3	5.5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	15	35.3	14 to 17	4	18 to 21	<0.1	<0.1	0.2	95%	99%	100%
						Marl	40032 (13.2-16.5')	3.88	-0.167	0.076	8.00E-11	5.17			0.008	10	35.2									
		B-B'	1	3 to 3.5	5.5	SILT	40034 (16.5-17.8')	2.29	-0.127	0.054	1.60E-09	3.44			0.007	25	35.2	16 to 17	4	20 to 21	0.1	0.6	1.6	74%	92%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.5E-10	3.09			0.010	15	31.9									
			2	3 to 3.5	5.5	SILT	40025 (3.3-6.6')	3.76	-0.099	0.077	3.90E-09	3.63			0.007	25	26.7	20 to 21	0	20 to 21	<0.1	<0.1	0.7	88%	95%	100%
						Marl	40016 (13.2-16.5')	3.73	-0.184	0.082	2.50E-10	3.09			0.010	15	31.9									
	1-2 (-10 to -30 ft)	D-D'	1	0.00	2.25	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	12	19.5	35	5	40	<0.1	1.5	13	68%	76%	87%
						Gray SILT/CLAY/Fine SAND	30043 (13.2-16.5')	3.3	-0.149	0.041	2.50E-09	4.11			0.008	12	31.6									
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	106	38.65									
			2	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	12	19.5	33	0	33	<0.1	>15	>15	67%	71%	71%
						Gray SILT/CLAY/Fine SAND	30043 (13.2-16.5')	3.3	-0.149	0.041	2.50E-09	4.11			0.008	12	31.6									
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	106	38.65									
			3	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	38	3	41	<0.1	0.5	>15	77%	81%	86%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	90	38.7									
			4	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	36	0	36	<0.1	0.5	>15	77%	78%	78%
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	90	38.7									
			5	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	32	21	53	<0.1	0.1	1	88%	92%	95%
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	90	38.7									
		E-E'	1	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	19	12	31	<0.1	0.7	4.2	72%	84%	93%
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	125	38.7									
			2	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	29	3	32	0.4	4	>15	52%	67%	82%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	125	38.7									
			3	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	26	0	26	>15	>15	>15	41%	41%	42%
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	125	38.7									
			4	0.00	3.75	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	29	4	33	0.2	4	15	56%	68%	86%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	123	38.65									
			5	0.00	3.75	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	20	13	33	<0.1	0.5	4	75%	85%	96%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	123	38.65									
			6	0.00	3.75	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	26	0	26	13	>15	>15	49%	49%	50%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	123	38.65									
						Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	12	19.5									

Attachment C
Table 1 - Summary of Geologic Sections For Consolidation Estimates

Remediation Area	Habitat Module	Cross Section	Case	Dredge Depth [ft]	Cap Thickness [ft]	Sediment Units	Sample Location (depth) for Consolidation Parameters	SICT Parameters A [-]	SICT Parameters B [-]	SICT Parameters Z [kPa]	SICT Parameters C [m/sec]	SICT Parameters D [-]	Oedometer Parameters Cc	Oedometer Parameters eo	Oedometer Parameters $C_{\alpha\epsilon}$	Thickness (ft)	Buoyant Weight (pcf)	Predicted Primary Consolidation (in)	Predicted Secondary Consolidation (in)	Predicted Total Consolidation (in)	Percent Consolidation vs. Time [yrs] 50%	Percent Consolidation vs. Time [yrs] 75%	Percent Consolidation vs. Time [yrs] 90%	Time after Cap Placement vs. Amount of Consolidation (in) 0.5 yr	Time after Cap Placement vs. Amount of Consolidation (in) 2 yr	Time after Cap Placement vs. Amount of Consolidation (in) 10 yr
	2 (-7 to -10 ft)	D-D'	1	0.00	3.75	Gray SILT/CLAY/Fine SAND	30043 (13.2-16.5')	3.3	-0.149	0.041	2.50E-09	4.11			0.008	12	31.6	35	5	40	<0.1	2	15	67%	75%	87%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	106	38.65									
			2	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	12	19.5	33	0	33	<0.1	>15	>15	66%	70%	70%
						Gray	30043 (13.2-16.5')	3.3	-0.149	0.041	2.50E-09	4.11			0.008	12	31.6									
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	106	38.65									
			3	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	38	3	41	<0.1	0.5	>15	76%	80%	85%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	90	38.7									
			4	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	36	0	36	<0.1	0.5	>15	76%	77%	77%
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	90	38.7									
			5	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	32	21	53	<0.1	<0.1	1.2	88%	91%	95%
						Brown SILT & CLAY (Marl)	30033 (51-53')								0.006	90	38.7									
		E-E'	1	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	19	12	31	<0.1	0.8	5	71%	83%	92%
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	125	38.7									
			2	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	29	3	32	0.3	4	>15	51%	66%	81%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	125	38.7									
			3	0.00	3.75	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	26	0	26	>15	>15	>15	39%	40%	40%
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	125	38.7									
			4	0.00	3.75	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	29	4	33	0.3	4	12	55%	67%	85%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	123	38.65									
			5	0.00	3.75	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	20	13	33	<0.1	0.5	4	74%	85%	96%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	123	38.65									
			6	0.00	3.75	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	26	0	26	<0.1	<0.1	<0.1	47%	48%	48%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	123	38.65									
		D-D'	1	0.00	4.25	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	12	19.5	26 to 29	5	31 to 34	<0.1	1.4	13	69%	77%	88%
						Gray SILT/CLAY/Fine SAND	30043 (13.2-16.5')	3.3	-0.149	0.041	2.50E-09	4.11			0.008	12	31.6									
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	106	38.65									
			2	3.75 to 5.25	4.25	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	12	19.5	25 to 28	0	25 to 28	<0.1	>15	>15	68%	72%	72%
						Gray SILT/CLAY/Fine SAND	30043 (13.2-16.5')	3.3	-0.149	0.041	2.50E-09	4.11			0.008	12	31.6									
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	106	38.65									
			3	0.00	4.25	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	28 to 32	4	32 to 36	<0.1	0.3	>15	77%	81%	86%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	90	38.7									
			4	0.00	4.25	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	27 to 30	0	27 to 30	<0.1	0.3	>15	78%	79%	79%
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	90	38.7									
			[illegible]	[illegible]	[illegible]	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Attachment C
Table 1 - Summary of Geologic Sections For Consolidation Estimates

Remediation Area	Habitat Module	Cross Section	Case	Dredge Depth [ft]	Cap Thickness [ft]	Sediment Units	Sample Location (depth) for Consolidation Parameters	SICT Parameters					Oedometer Parameters			Thickness (ft)	Buoyant Weight (pcf)	Predicted Primary Consolidation (in)	Predicted Secondary Consolidation (in)	Predicted Total Consolidation (in)	Percent Consolidation			Time after Cap Placement		
								A	B	Z	C	D	Cc	eo	$C_{\alpha\epsilon}$						vs. Time [yrs]			vs. Amount of Consolidation (in)		
								[-]	[-]	[kPa]	[m/sec]	[-]									50%	75%	90%	0.5 yr	2 yr	10 yr
B	3A (-4 to -7 ft)		5	0.00	4.25	Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	90	38.7	24 to 27	23	47 to 50	<0.1	0.1	1	88%	92%	95%
		E-E'	1	0.00	4.25	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	15 to 19	12 to 13	27 to 32	<0.1	1	5	70%	83%	92%
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	125	38.7									
			2	0.00	4.25	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	23 to 30	3	26 to 33	0.5	4.2	>15	49%	65%	80%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	125	38.7									
			3	0.00	4.25	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	21 to 27	0	21 to 27	>15	>15	>15	38%	38%	38%
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	125	38.7									
			4	0.00	4.25	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	19 to 29	5	24 to 34	0.3	4	15	54%	67%	85%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	123	38.65									
			5	1 to 4.5	4.25	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	14 to 20	13 to 15	27 to 35	<0.1	0.7	4.3	73%	84%	95%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	123	38.65									
			6	1 to 4.5	4.25	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	18 to 26	0	18 to 26	>15	>15	>15	46%	47%	47%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	123	38.65									
	Module 3A (-2 to -3 ft)	D-D'	1	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	12	19.5	34 to 39	5	39 to 44	<0.1	1.9	14	67%	75%	87%
						Gray SILT/CLAY/Fine SAND	30043 (13.2-16.5')	3.3	-0.149	0.041	2.50E-09	4.11			0.008	12	31.6									
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	106	38.65									
			2	3 to 5.25	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	12	19.5	33 to 37	0	33 to 37	<0.1	>15	>15	66%	70%	70%
						Gray SILT/CLAY/Fine SAND	30043 (13.2-16.5')	3.3	-0.149	0.041	2.50E-09	4.11			0.008	12	31.6									
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	106	38.65									
			3	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	38 to 43	3	41 to 46	<0.1	0.4	>15	76%	80%	85%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	90	38.7									
			4	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	36 to 41	0	36 to 41	<0.1	0.4	>15	76%	77%	77%
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	90	38.7									
			5	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	32 to 36	20 to 21	52 to 57	<0.1	0.1	1.2	88%	91%	95%
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	90	38.7									
		E-E'	1	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	19 to 23	10 to 12	29 to 35	<0.1	0.8	4.8	71%	83%	92%
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	125	38.7									
			2	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	31 to 37	3	34 to 40	0.5	4.2	>15	51%	66%	80%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	125	38.7									
			3	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	27 to 33	0	27 to 33	>15	>15	>15	39%	39%	40%
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	125	38.7									
			4	0.00	5.50	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	27 to 36	1	28 to 37	0.2	3.6	14	56%	68%	85%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	123	38.65									
						Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6									

Attachment C
Table 1 - Summary of Geologic Sections For Consolidation Estimates

Remediation Area	Habitat Module	Cross Section	Case	Dredge Depth [ft]	Cap Thickness [ft]	Sediment Units	Sample Location (depth) for Consolidation Parameters	SICT Parameters					Oedometer Parameters			Thickness (ft)	Buoyant Weight (pcf)	Predicted Primary Consolidation (in)	Predicted Secondary Consolidation (in)	Predicted Total Consolidation (in)	Percent Consolidation vs. Time [yrs]			Time after Cap Placement vs. Amount of Consolidation (in)		
								A [-]	B [-]	Z [kPa]	C [m/sec]	D [-]	Cc	eo	$C_{\alpha\varepsilon}$						50%	75%	90%	0.5 yr	2 yr	10 yr
			5	1 to 4.5	5.50	Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3	19 to 24	4	23 to 28	<0.1	0.4	3.8	76%	86%	96%
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	123	38.65									
			6	1 to 4.5	5.50	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	25 to 32	0	25 to 32	11	>15	>15	49%	49%	50%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	123	38.65									
	Module 5A	D-D'	1	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	12	19.5	34 to 37	5	39 to 42	<0.1	1.9	14	67%	76%	87%
						Gray SILT/CLAY/Fine SAND	30043 (13.2-16.5')	3.3	-0.149	0.041	2.50E-09	4.11			0.008	12	31.6									
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	106	38.65									
			2	3.75 to 5.5	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	12	19.5	32 to 35	0	32 to 35	<0.1	>15	>15	66%	70%	70%
						Gray SILT/CLAY/Fine SAND	30043 (13.2-16.5')	3.3	-0.149	0.041	2.50E-09	4.11			0.008	12	31.6									
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	106	38.65									
			3	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	37 to 41	3	40 to 44	<0.1	0.4	>15	76%	80%	85%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	90	38.7									
			4	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	35 to 39	0	35 to 39	<0.1	0.4	>15	76%	77%	77%
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	90	38.7									
			5	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	40	19.5	31 to 35	21 to 22	52 to 57	<0.1	0.1	1.2	88%	92%	95%
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	90	38.7									
		E-E'	1	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	18 to 20	12	30 to 32	<0.1	0.8	4.7	71%	83%	92%
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	125	38.7									
			2	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	29 to 32	3	32 to 35	0.5	4.2	>15	51%	66%	80%
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	125	38.7									
			3	0.00	5.50	Solvay Waste	30040 (0-3.3')	7.23	-0.114	0.039	9.60E-12	6.33			0.010	5	19.5	26 to 29	0	26 to 29	>15	>15	>15	39%	39%	40%
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	125	38.7									
			4	0.00	5.50	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	24 to 29	4	28 to 33	0.2	3.6	15	56%	68%	85%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	10013 (41-43') 10018 (48-50') 10022 (64-66') 10024 (64-66') 10025 (52-54') 10026 (50-52')						0.58	1.7	0.009	123	38.65									
			5	3.75 to 5.5	5.50	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	17 to 20	14	31 to 34	<0.1	0.4	3.8	76%	86%	96%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	30033 (51-53')						0.16	0.7	0.006	123	38.65									
			6	3.75 to 5.5	5.50	Organic Silt	20079 (0-3.3")	4.17	-0.205	0.823	7.90E-09	2.29			0.009	2	26.6	22 to 26	0	22 to 26	10	>15	>15	49%	49%	50%
						Solvay Waste	30036 (6.6-9.9')	4.92	-0.149	0.018	1.80E-10	4.19			0.008	5	35.3									
						Brown SILT & CLAY (Marl)	30033 (47-49')						0.4	1.3	0.008	123	38.65									
		F-F'	1	0	0	Solvay Waste	AVG from Geosyntec report						0.03	3.77	0.002	15	19	22	5	27	0.8	2.4	4.8	44%	71%	96%
						Marl	30033 (35.5-37.0')	4.95	-0.247	1.153	2E-09	2.49			0.010	50	36									
			2	0	0	Solvay Waste	AVG from Geosyntec report						0.03	3.77	0.002	15	19	9	4	13	0.6	2.2	4.8	46%	73%	98%
						Marl	30033 (47-49') 30033 (51-53')						0.28	0.97	0.007	50	56									
			1	0	0	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	12	6	18	<0.1	0.15	1.5	84%	92%	98%
						Brown Clay	20016 (27-29')						0.19	0.89	0.006	50	65									
			2	0	0	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	13	0	13	<0.1	>12	>12	72%	74%	76%
						Brown Clay	20017 (42-44')						0.22	0.87	0.007	50	56									
			3	0	0	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	16	6	22	<0.1	0.4	1.8	78%	91%	99%
						Brown Clay	20016 (27-29')						0.19	0.89	0.006	50	56									

Attachment C
Table 1 - Summary of Geologic Sections For Consolidation Estimates

Remediation Area	Habitat Module	Cross Section	Case	Dredge Depth [ft]	Cap Thickness [ft]	Sediment Units	Sample Location (depth) for Consolidation Parameters	SICT Parameters					Oedometer Parameters			Thickness (ft)	Buoyant Weight (pcf)	Predicted Primary Consolidation (in)	Predicted Secondary Consolidation (in)	Predicted Total Consolidation (in)	Percent Consolidation			Time after Cap Placement		
								A	B	Z	C	D	Cc	eo	$C_{\alpha\epsilon}$						vs. Time [yrs]			vs. Amount of Consolidation (in)		
								[-]	[-]	[kPa]	[m/sec]	[-]									50%	75%	90%	0.5 yr	2 yr	10 yr
C	1-2 (-10 to -30 ft)	G-G'	4	0	0	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	16	0	16	<0.1	1.2	>15	70%	78%	81%
						Brown Clay	20017 (42-44')						0.22	0.87	0.007	50	65									
			5	0	0	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	17	7	24	<0.1	0.4	2	76%	90%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	50	56									
			6	0	0	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	13	6	19	<0.1	0.2	2.1	80%	90%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	50	56									
		H-H'	1	0	0	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.90E-09	4.05			0.008	10	37	17	7	24	<0.1	0.2	1.6	82%	91%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	55	56									
			2	0	0	Organic SILT	20079 (0-3.3')	4.17	-0.205	0.823	7.90E-09	2.29			0.009	10	27	23	8	31	<0.1	0.1	1.3	85%	93%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	55	56									
			3	0	0	Organic SILT	20079 (0-3.3')	4.17	-0.205	0.823	7.90E-09	2.29			0.009	10	27	29	6	35	<0.1	0.7	3.7	74%	84%	97%
						CLAY (Marl)	20074 (13.2-16.5')	3.51	-0.13	0.015	1.90E-10	3.56			0.009	55	36									
	2 (-7 to -10 ft)	F-F'	1	0	0	Solvay Waste	AVG from Geosyntec report						0.03	3.77	0.002	15	19	22	5	27	0.8	2.4	4.8	44%	71%	96%
						Marl	30033 (35.5-37.0')	4.95	-0.247	1.153	2E-09	2.49			0.010	50	36									
			2	0	0	Solvay Waste	AVG from Geosyntec report						0.03	3.77	0.002	15	19	9	4	13	0.6	2.2	4.8	46%	73%	98%
						Marl	30033 (47-49') 30033 (51-53')						0.28	0.97	0.007	50	56									
		G-G'	1	0	0	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	12	6	18	<0.1	0.15	1.5	84%	92%	98%
						Brown Clay	20016 (27-29')						0.19	0.89	0.006	50	65									
			2	0	0	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	13	0	13	<0.1	11	>12	71%	73%	75%
						Brown Clay	20017 (42-44')						0.22	0.87	0.007	50	56									
			3	0	0	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	16	6	22	<0.1	0.4	1.8	77%	91%	99%
						Brown Clay	20016 (27-29')						0.19	0.89	0.006	50	56									
			4	0	0	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	16	0	16	<0.1	1.2	>15	67%	77%	80%
						Brown Clay	20017 (42-44')						0.22	0.87	0.007	50	65									
		H-H'	1	0	0	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.90E-09	4.05			0.008	10	37	17	7	24	<0.1	0.2	1.6	81%	91%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	55	56									
			2	0	0	Organic SILT	20079 (0-3.3')	4.17	-0.205	0.823	7.90E-09	2.29			0.009	10	27	23	8	31	<0.1	0.1	1.3	85%	93%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	55	56									
			3	0	0	Organic SILT	20079 (0-3.3')	4.17	-0.205	0.823	7.90E-09	2.29			0.009	10	27	29	6	35	<0.1	0.8	3.7	73%	84%	97%
						CLAY (Marl)	20074 (13.2-16.5')	3.51	-0.13	0.015	1.90E-10	3.56			0.009	55	36									
		F-F'	1	0.5 to 1.5	0	Solvay Waste	AVG from Geosyntec report						0.03	3.77	0.002	15	19	22 to 24	5	27 to 29	0.8	2.4	4.8	44%	71%	96%
						Marl	30033 (35.5-37.0')	4.95	-0.247	1.153	2E-09	2.49			0.010	50	36									
			2	0.5 to 1.5	0	Solvay Waste	AVG from Geosyntec report						0.03	3.77	0.002	15	19	9	4	13	0.6	2.2	4.7	46%	73%	97%
						Marl	30033 (47-49') 30033 (51-53')						0.28	0.97	0.007	50	56									
		G-G'	1	0.5 to 8	0	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	0 to 13	0 to 6	0 to 19	<0.1	0.15	1.5	85%	92%	98%
						Brown Clay	20016 (27-29')						0.19	0.89	0.006	50	65									
			2	0.5 to 8	0	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	0 to 13	0	0 to 13	<0.1	4.8	>12	73%	74%	76%
						Brown Clay	20017 (42-44')						0.19	0.89	0.007	50	56									

Attachment C
Table 1 - Summary of Geologic Sections For Consolidation Estimates

Remediation Area	Habitat Module	Cross Section	Case	Dredge Depth [ft]	Cap Thickness [ft]	Sediment Units	Sample Location (depth) for Consolidation Parameters	SICT Parameters					Oedometer Parameters			Thickness (ft)	Buoyant Weight (pcf)	Predicted Primary Consolidation (in)	Predicted Secondary Consolidation (in)	Predicted Total Consolidation (in)	Percent Consolidation			Time after Cap Placement		
								A	B	Z	C	D	Cc	eo	$C_{\alpha\epsilon}$						vs. Time [yrs]			vs. Amount of Consolidation (in)		
								[-]	[-]	[kPa]	[m/sec]	[-]									50%	75%	90%	0.5 yr	2 yr	10 yr
	3B (-4 to -7 ft)		3	0.5 to 8	0	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	0 to 16	0 to 6	0 to 22	<0.1	0.4	1.8	78%	91%	99%
						Brown Clay	20016 (27-29')						0.22	0.87	0.006	50	56									
			4	0.5 to 8	0	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	0 to 16	0	0 to 16	<0.1	1.2	>15	69%	78%	80%
						Brown Clay	20017 (42-44')						0.22	0.87	0.007	50	65									
		H-H'	1	0.5 to 5.25	0	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.90E-09	4.05			0.008	10	37	6 to 18	8	14 to 26	<0.1	0.1	1.3	85%	93%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	55	56									
			2	0.5 to 5.25	0	Organic SILT	20079 (0-3.3')	4.17	-0.205	0.823	7.90E-09	2.29			0.009	10	27	14 to 24	9	23 to 33	<0.1	0.1	1	86%	94%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	55	56									
			3	0.5 to 5.25	0	Organic SILT	20079 (0-3.3')	4.17	-0.205	0.823	7.90E-09	2.29			0.009	10	27	17 to 30	7	24 to 37	<0.1	0.4	3.4	76%	85%	98%
						CLAY (Marl)	20074 (13.2-16.5')	3.51	-0.13	0.015	1.90E-10	3.56			0.009	55	36									
	3B (-2 to -3 ft)	F-F'	1	0.5 to 5	2.25	Solvay Waste	AVG from Geosyntec report						0.03	3.77	0.002	15	19	23 to 29	5	28 to 34	0.8	2.4	4.8	44%	71%	98%
						Marl	30033 (35.5-37.0')	4.95	-0.247	1.153	2E-09	2.49			0.010	50	36									
			2	0.5 to 5	2.25	Solvay Waste	AVG from Geosyntec report						0.03	3.77	0.002	15	19	9 to 11	4	13 to 15	0.6	2.2	4.7	46%	73%	97%
						Marl	30033 (47-49') 30033 (51-53')						0.28	0.97	0.007	50	56									
		G-G'	1	0.5 to 8	2.25	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	0 to 15	0 to 6	0 to 21	<0.1	0.15	1.2	87%	93%	99%
						Brown Clay	20016 (27-29')						0.19	0.89	0.006	50	65									
			2	0.5 to 8	2.25	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	0 to 16	0	0 to 16	<0.1	0.4	>12	76%	78%	79%
						Brown Clay	20017 (42-44')						0.22	0.87	0.007	50	56									
			3	0.5 to 8	2.25	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	0 to 20	0 to 6	0 to 26	<0.1	0.4	1.6	80%	92%	99%
						Brown Clay	20016 (27-29')						0.19	0.89	0.006	50	56									
			4	0.5 to 8	2.25	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	0 to 20	0	0 to 20	<0.1	0.8	>15	72%	80%	82%
						Brown Clay	20017 (42-44')						0.22	0.87	0.007	50	65									
		H-H'	1	4.5 to 5	2.25	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.90E-09	4.05			0.008	10	37	12 to 13	7	19 to 20	<0.1	0.2	1.4	84%	92%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	55	56									
			2	4.5 to 5	2.25	Organic SILT	20079 (0-3.3')	4.17	-0.205	0.823	7.90E-09	2.29			0.009	10	27	21	8	29	<0.1	0.1	1.2	85%	93%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	55	56									
			3	4.5 to 5	2.25	Organic SILT	20079 (0-3.3')	4.17	-0.205	0.823	7.90E-09	2.29			0.009	10	27	26 to 27	6	32 to 33	<0.1	0.6	3.7	74%	85%	98%
						CLAY (Marl)	20074 (13.2-16.5')	3.51	-0.13	0.015	1.90E-10	3.56			0.009	55	36									
	5B (-0.5 to -2 ft)	F-F'	1	3.5 to 6.5	2.25	Solvay Waste	AVG from Geosyntec report						0.03	3.77	0.002	15	19	20 to 25	5	25 to 30	0.8	2.4	4.8	44%	71%	98%
						Marl	30033 (35.5-37.0')	4.95	-0.247	1.153	2E-09	2.49			0.010	50	36									
			2	3.5 to 6.5	2.25	Solvay Waste	AVG from Geosyntec report						0.03	3.77	0.002	15	19	8 to 10	4	12 to 14	0.7	2.2	4.7	46%	73%	97%
						Marl	30033 (47-49') 30033 (51-53')						0.28	0.97	0.007	50	56									
		G-G'	1	3.5 to 6	2.25	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	4 to 10	8	12 to 18	<0.1	0.15	1.2	86%	92%	99%
						Brown Clay	20016 (27-29')						0.19	0.89	0.006	50	65									
			2	3.5 to 6	2.25	Soft silt and clay	20070 (9.9'-13.2')	1.77	-0.137	0.051	1.70E-08	2.65			0.007	15	44	5 to 11	0	5 to 11	<0.1	0.5	>12	75%	77%	78%
						Brown Clay	20017 (42-44')						0.22	0.87	0.007	50	56									
			3	3.5 to 6	2.25	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	7 to 14	7	14 to 21	<0.1	0.4	1.6	79%	92%	99%
						Brown Clay	20016 (27-29')						0.19	0.89	0.006	50	56									
			4	3.5 to 6	2.25	Soft silt and clay	20017 (10-12')						0.51	1.42	0.009	15	40	8 to 14	0	8 to 14	<0.1	0.8	>15	71%	80%	82%
						Brown Clay	20017 (42-44')						0.22	0.87	0.007	50	65									
			1	3.5 to 5.25	2.25	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.90E-09	4.05			0.008	10	37	11 to 16	7	18 to 23	<0.1	0.2	1.5	83%	92%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	55	56									

Attachment C

Table 1 - Summary of Geologic Sections For Consolidation Estimates

Remediation Area	Habitat Module	Cross Section	Case	Dredge Depth [ft]	Cap Thickness [ft]	Sediment Units	Sample Location (depth) for Consolidation Parameters	SICT Parameters A [-]	SICT Parameters B [-]	SICT Parameters Z [kPa]	SICT Parameters C [m/sec]	SICT Parameters D [-]	Oedometer Parameters Cc	Oedometer Parameters eo	Oedometer Parameters $C_{\alpha\epsilon}$	Thickness (ft)	Buoyant Weight (pcf)	Predicted Primary Consolidation (in)	Predicted Secondary Consolidation (in)	Predicted Total Consolidation (in)	Percent Consolidation vs. Time [yrs] 50%	Percent Consolidation vs. Time [yrs] 75%	Percent Consolidation vs. Time [yrs] 90%	Time after Cap Placement vs. Amount of Consolidation (in) 0.5 yr	Time after Cap Placement vs. Amount of Consolidation (in) 2 yr	Time after Cap Placement vs. Amount of Consolidation (in) 10 yr
		H-H'	2	3.5 to 5.25	2.25	Organic SILT	20079 (0-3.3')	4.17	-0.205	0.823	7.90E-09	2.29			0.009	10	27	20 to 23	8	28 to 31	<0.1	0.1	1.2	85%	93%	99%
						Red/Brown CLAY & SILT	20001 (44.9-46.9') 20004 (36.6-38.6') 20007 (38.6-40.6') 20016 (27-29') 20017 (42-44') 20018 (47-49')						0.26	0.98	0.007	55	56									
			3	3.5 to 5.25	2.25	Organic SILT	20079 (0-3.3')	4.17	-0.205	0.823	7.90E-09	2.29			0.009	10	27	25 to 29	6	31 to 35	<0.1	0.6	3.7	74%	84%	98%
						CLAY (Marl)	20074 (13.2-16.5')	3.51	-0.13	0.015	1.90E-10	3.56			0.009	55	36									
	Module 1 (-20 to -30 ft)	I-I'	1	0	2.75	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.9E-09	4.05			0.008	3	37.4	19	15	34	<0.1	0.3	1.8	79%	91%	100%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	30	33.17									
						Organic SILT	60016 (14-16')	3.49	-0.195	2.19	5.3E-09	3.34			0.008	97	36.19									
			2	0	2.75	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	3	22.3	26	17	43	<0.1	0.4	1.5	77%	93%	100%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	15	33.17									
						Organic SILT	60016 (14-16')	3.49	-0.195	2.19	5.3E-09	3.34			0.008	112	36.19									
			3	0	2.75	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	3	22.3	25	8	33	0.1	1.5	7	66%	78%	93%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	115	31.1									
			4	0	2.75	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	3	22.34	27	9	36	0.3	1.6	6.7	59%	78%	94%
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	124.8	31.1									
			5	0	2.75	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	6	22.3	31	8	39	0.2	1.6	6	60%	78%	94%
						Solvay Waste	10026 (3.3-6.6') 10080 (9.9-13.2') 10081A (13.2-16.5') 10105 (0-3.3')	7	-0.102	0.126	2.71E-10	4.65			0.070	6	22.5									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	118	31.129073									
		J-J'	1	0	2.75	Soft SILT	60056 (0.5-3.3')	4.15	-0.202	0.15	1.7E-10	3.79			0.013	10	20.9	35	8	43	0.4	2.3	8	52%	73%	93%
						Medium Stiff CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	115	31.9									
			2	0	2.75	Soft SILT	60064 (0.0-3.3')	3.1	-0.17	0.031	3.1E-10	3.9			0.009	10	28.3	28	7	35	0.4	2.4	9	52%	72%	92%
						Medium Stiff CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	115	31.9									
			3	0	2.75	Soft SILT	60019 (16-18')	4.31	-0.239	2.98	2E-09	2.85			0.010	10	34.3	26	7	33	0.3	2.4	9	57%	73%	92%
						Medium Stiff CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	115	31.9									
		K-K'	1	0	2.75	SILT & Fine SAND	60017 (8-10')	2.85	-0.134	0.524	2.00E-09	3.71			0.007	5	34.3	24	7	31	0.2	2.7	8	57%	71%	91%
						Soft SILT	60016 (14-16')	3.49	-0.195	2.19	5.30E-09	3.34			0.008	5	34.27									
						SILT & CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.80E-10	4.17			0.009	115	31.9									
			2	0	2.75	SILT & Fine SAND	60054 (3.3-6.6')	4.13	-0.218	0.11	1.7E-10	3.67			0.012	5	21.8	33	8	41	0.4	1.9	7	55%	76%	93%
						Organic SILT	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	120	31.9									
			3	0	2.75	SILT & Fine SAND	60056 (0.5-3.3')	4.15	-0.202	0.15	1.7E-10	3.79			0.013	15	20.9	37	12	49	0.4	1.7	3.9	54%	78%	99%
						Organic SILT	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	110	31.9									
	Module 2 (-7 to -20 ft)	I-I'	1	0	3.5	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.9E-09	4.05			0.008	3	37.4	24	15	39	<0.1	0.4	1.9	78%	91%	100%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	30	33.17									
						Organic SILT	60016 (14-16')	3.49	-0.195	2.19	5.3E-09	3.34			0.008	97	28.34									
			2	0	3.5	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	3	22.3	31	16	47	<0.1	0.5	1.6	76%	92%	100%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	15	33.17									
						Organic SILT	60016 (14-16')	3.49	-0.195	2.19	5.3E-09	3.34			0.008	112	36.19									
			3	0	3.5	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	3	22.3	30	8	38	0.1	1.9	8	62%	76%	92%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	115	31.13									
			4	0	3.5	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	3	22.34	32	8	40	0.3	1.8	7	56%	76%	93%
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	123.8	31.1									
			5	0	3.5	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	6	22.3	36	9	45	0.25	1.9	6.9	58%	76%	93%
						Solvay Waste	10026 (3.3-6.6') 10080 (9.9-13.2') 10081A (13.2-16.5') 10105 (0-3.3')	7	-0.102	0.126	2.71E-10	4.65			0.070	6	22.5									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	118	31.129073									
		J-J'	1	0	3.25	Soft SILT	60056 (0.5-3.3')	4.15	-0.202	0.15	1.7E-10	3.79			0.013	10	20.9	39	8	47	0.5	2.6	8	50%	71%	92%
						Medium Stiff CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	115	31.9									
			2	0	3.25	Soft SILT	60064 (0.0-3.3')	3.1	-0.17	0.031	3.1E-10	3.9			0.009	10	28.3	32	7	39	0.6	2.7	9	49%	70%	91%
						Medium Stiff CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	115	31.9									
			3	0	3.25	Soft SILT	60019 (16-18')	4.31	-0.239	2.98	2E-09	2.85			0.010	10	34.3	30	7	37	0.3	2.5	9	56%	72%	91%
						Medium Stiff CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	115	31.9									
			1	0	3.25	SILT & Fine SAND	60017 (8-10')	2.85	-0.134	0.524	2.00E-09	3.71			0.007	5	34.3	27	7	34	0.3	2.9	9	55%	70%	91%
						Soft SILT	60016 (14-16')	3.49	-0.195	2.19	5.30E-09	3.34			0.008	5	34.27									

Attachment C

Table 1 - Summary of Geologic Sections For Consolidation Estimates

Remediation Area	Habitat Module	Cross Section	Case	Dredge Depth [ft]	Cap Thickness [ft]	Sediment Units	Sample Location (depth) for Consolidation Parameters	SICT Parameters A [-]	B [-]	Z [kPa]	C [m/sec]	D [-]	Oedometer Parameters Cc	eo	$C_{\alpha\epsilon}$	Thickness (ft)	Buoyant Weight (pcf)	Predicted Primary Consolidation (in)	Predicted Secondary Consolidation (in)	Predicted Total Consolidation (in)	Percent Consolidation vs. Time [yrs] 50%	75%	90%	Time after Cap Placement vs. Amount of Consolidation (in) 0.5 yr	2 yr	10 yr
E		K-K'				SILT & CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.80E-10	4.17			0.009	115	31.9									
			2	0	3.25	SILT & Fine SAND	60054 (3.3-6.6')	4.13	-0.218	0.11	1.7E-10	3.67			0.012	5	21.8	37	8	45	0.4	2.1	8	52%	74%	93%
						Organic SILT	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	120	31.9									
			3	0	3.25	SILT & Fine SAND	60056 (0.5-3.3')	4.15	-0.202	0.15	1.7E-10	3.79			0.013	15	20.9	41	12	53	0.4	1.9	4	52%	77%	99%
						Organic SILT	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	110	31.9									
	3B (-3 to -7 ft)	I-I'	1	0 to 3.5	5	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.9E-09	4.05			0.008	3	37.4	20 to 32	0	20 to 32	0.2	6	>12	54%	63%	81%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	115	31.1									
			2	0 to 3.5	5	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	3	22.3	30 to 38	0	30 to 38	0.2	4.8	>12	57%	67%	81%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	115	31.1									
			3	0 to 3.5	5	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.9E-09	4.05			0.008	3	37.4	17 to 27	23	40 to 50	<0.1	0.1	0.4	92%	99%	100%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						Organic SILT	60016 (14-16')	3.66	-0.09	0.027	2.8E-09	3.98			0.008	115	28.34									
		J-J'	1	0 to 5.5	5	Soft SILT	60064 (0.0-3.3')	3.1	-0.17	0.031	3.1E-10	3.9			0.009	10	28.3	25 to 44	0	25 to 44	0.7	4.4	>11	45%	64%	85%
						SILT & CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	115	31.9									
			2	0 to 5.5	5	Soft SILT	60019 (16-18')	4.31	-0.239	2.98	2E-09	2.85			0.010	18	28.3	25 to 46	0	25 to 46	0.4	3.5	>11	52%	69%	85%
						SILT & CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	107	31.9									
			3	0 to 5.5	5	Soft SILT	60056 (0.5-3.3')	4.15	-0.202	0.15	1.7E-10	3.79			0.013	7	20.9	36 to 50	0	36 to 50	0.8	4.3	>11	45%	65%	85%
						SILT & CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.80E-10	4.17			0.009	118	31.9									
		K-K'	1	0 to 6	5	SILT & Fine SAND	60017 (8-10')	2.85	-0.134	0.524	2.00E-09	3.71			0.007	6	34.3	13 to 36	14	27 to 50	0.1	0.8	2.5	66%	87%	>98.5%
						Organic SILT	60016 (14-16')	3.49	-0.195	2.19	5.30E-09	3.34			0.008	119	35.8									
			2	0 to 6	5	SILT & Fine SAND	60017 (8-10')	2.85	-0.134	0.524	2.00E-09	3.71			0.007	6	34.3	14 to 37	0 to 4	14 to 41	0.18	4	14	59%	68%	85%
						Soft SILT	60016 (14-16')	3.49	-0.195	2.19	5.30E-09	3.34			0.008	10	35.78									
						SILT & CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.80E-10	4.17			0.009	109	31.9									
			3	0 to 6	5	SILT & Fine SAND	60017 (8-10')	2.85	-0.134	0.524	2.00E-09	3.71			0.007	6	34.3	14 to 38	0	14 to 38	0.8	5	>7	46%	60%	>76%
						SILT & CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.80E-10	4.17			0.009	119	31.9									
			4	0 to 6	5	Soft SILT	60056 (0.5-3.3')	4.15	-0.202	0.15	1.7E-10	3.79			0.013	8	20.9	35 to 51	0	35 to 51	0.8	4	>7	45%	65%	>80%
						SILT & CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.80E-10	4.17			0.009	117	31.9									
			5	0 to 6	5	Soft SILT	60054 (3.3-6.6')	4.13	-0.218	0.11	1.7E-10	3.67			0.012	8	21.8	35 to 52	0	35 to 52	0.8	4	>7	43%	64%	>83%
						SILT & CLAY	60061 (13.2-16.5')	3.46	-0.178	0.091	4.8E-10	4.17			0.009	117	31.9									
	3B (-2 to -3 ft)	I-I'	1	2.5 to 3.5	5.5	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.9E-09	4.05			0.008	3	37.4	12 to 26	0	12 to 26	0.1	6	>12	57%	65%	81%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	115	31.1									
			2	2.5 to 3.5	5.5	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	3	22.3	27 to 35	0	27 to 35	0.2	4.6	>12	58%	68%	83%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	115	31.1									
			3	2.5 to 3.5	5.5	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.9E-09	4.05			0.008	3	37.4	10 to 22	24	34 to 46	<0.1	0.1	0.4	92%	99%	100%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						Organic SILT	60016 (14-16')	3.66	-0.09	0.027	2.8E-09	3.98			0.008	115	28.34									
	5B (-0.5 to -2 ft)	I-I'	1	2 to 4.5	5.5	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.9E-09	4.05			0.008	3	37.4	19 to 28	0	19 to 28	0.1	6	>12	57%	65%	81%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	115	31.1									
			2	2 to 4.5	5.5	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	3	22.3	31 to 36	0	31 to 36	0.2	4.7	>12	58%	68%	82%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	115	31.1									
			3	2 to 4.5	5.5	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.9E-09	4.05			0.008	3	37.4	16 to 24	23	39 to 47	<0.1	0.1	0.4	92%	99%	100%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						Organic SILT	60016 (14-16')	3.66	-0.09	0.027	2.8E-09	3.98			0.008	115	28.34									
	6B (+1 to -1 ft)	I-I'	1	3 to 5	5.5	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.9E-09	4.05			0.008	3	37.4	17 to 25	0	17 to 25	0.2	6.2	>12	54%	63%	80%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	115	31.1									
			2	3 to 5	5.5	Organic SILT	70031 (0-3.3')	4.7	-0.194	0.109	8.1E-11	3.74			0.012	3	22.3	30 to 34	0	30 to 34	0.2	5	>12	56%	66%	83%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						SILT & CLAY	70022 (13.2-16.5')	3.28	-0.146	0.028	2.3E-10	4.82			0.009	115	31.1									
			3	3 to 5	5.5	Organic SILT	70006 (2-4')	2.64	-0.194	0.943	6.9E-09	4.05			0.008	3	37.4	15 to 21	24	39 to 45	<0.1	0.1	0.4	92%	99%	100%
						SILT & Fine SAND	70006 (10-12')	2.74	-0.091	0.065	5.6E-09	3.25			0.006	12	33.17									
						Organic SILT	60016 (14-16')	3.66	-0.09	0.027	2.8E-09	3.98			0.008	115	28.34									