APPENDIX B

ENGINEERING ASSESSMENTS

Attachment B-1 - Reserved

Attachment B-2 - Material Handling Properties

Attachment B-3 - Construction Water Treatment

Attachment B-4 - Stability Analysis

Attachment B-5 - Residual Analysis

Attachment B-6 - Utilities

Attachment B-7 - Stormwater Management

ATTACHMENT B-1

REVSERVED

ATTACHMENT B-2

MATERIAL HANDLING PROPERTIES

(ATTACHED AS PRESENTED IN THE NINEMILE CREEK 50%, 95%, AND DRAFT 100% DESIGN REPORTS)

ATTACHMENT B-2

MATERIAL HANDLING PROPERTIES

1.0 INTRODUCTION

The Ninemile Creek channel sediment, floodplain, and bank require removals as part of the remediation process. Most or all of the materials will be mechanically removed; mechanically removed materials are expected to be trucked to and placed on the LCP OU-1 Containment Area. The materials will need to be adequately conditioned for this process to occur efficiently. This appendix describes the available data, interpretation of this data, and conclusions and recommendations.

2.0 AVAILABLE DATA

Available testing that pertains to this issue includes water level monitoring in Ninemile Creek in 2009 and 2010, and geotechnical laboratory testing, including modified column testing, on samples obtained from test pits and vibracores in the Ninemile Creek channel and the lower Reach CD floodplain during 2008 and 2009.

Samples NMC-TP-1A, NMC-TP-1B and NMC-TP-1C were obtained in the top 6 feet of the Reach CD channel sediments. Samples NMC-TP-2A, NMC-TP-2B and NMC-TP-2C were obtained in top 4 feet of the Reach CD floodplain soils. Samples NMC-TP-3A, NMC-TP-3B, and NMC-TP-3C were obtained from the top 3 feet of sediment from the Reach BC channel. These samples were used in the modified column testing program. Additional individual samples from the 2009 boring program were tested for geotechnical index properties from Reaches BC and CD. Composite samples were also prepared from prior samples from Reaches AB, BC, and CD and tested for geotechnical index properties.

Table 1 provides a summary of the available material data by reach. The field and laboratory results pertinent to material management are provided in Attachment A, including drawings showing sample locations.

3.0 BANK MATERIALS

The bank materials are a variety of materials, primarily silts and clays. It is expected that these bank materials will be relatively dry above the waterline and suitable for immediate transportation and placement after excavation. They may be sufficiently dry to be used for mixing with small quantities of soil or sediment from other locations to absorb excess water from the sediment for transportation and/or placement.

If the bank materials fall into the creek or are otherwise exposed to water, they will likely absorb significant water, be difficult to dewater, and may require solidification for transportation and placement.

4.0 REACH CD FLOODPLAIN

The samples from the Reach CD floodplain, including the NMC-TP-2 series, indicate that the upper 4 to 9 feet is generally a stiff to hard low plasticity glacio-lacustrine clay. There appear to be localized sand deposits above the underlying glacio-lacustrine clay as composite sample NMC-SED-C13 indicates that some of the sediments are silty sands. The remaining composite samples NMC-SED-C11, C12 and C14 from the lower Reach CD floodplain sediments indicate that the bulk of the sediments are low plasticity clays or silts. NMC-SED-C13 and C14 and the TP-2 series of samples were tested for organic content and were found to have organic contents ranging from about 2% to 7%, which is a range typical of topsoils. The predominance of low plasticity silts and clays and materials with relatively high organic contents indicates that most of the excavated materials during the sediment remedial activities will have the characteristics of clay or organic silt with a high water holding capacity.

At the time of sampling, the water contents of these soils were generally at about the plastic limit, and slightly above the optimum moisture content for compaction.

The modified column testing program added water equal to about one-quarter of the sample volume of soil. This water was absorbed by the soil which became very soft. Subsequently, the wet soil did not lose significant water during the modified column test. These observations and the collected geotechnical data suggest that, these soils should be good for excavation, transportation, and fill placement provided that they are not allowed to become wet. If they become wet, they would likely require extensive drying or solidification to become readily manageable again.

In their undisturbed condition, the glacio-lacustrine clays immediately underlying the surface soils and sediments should be a good working surface for construction vehicles in dry weather. Experience working with these types of clays has shown that their horizontally bedded nature generally means that equipment traffic over them in wet conditions will typically cause them to lose their relatively high strength about 1 foot or so at a time. This is sufficient to make trafficability poor in bad weather or flooding. Seal-rolling exposed surfaces will support maintaining a good traffic surface.

When excavated, the clays would not require dewatering and should be compactable to a dense fill condition at the excavated moisture content provided that they are protected from water addition due to precipitation or flooding. Generally below the clays is a non-plastic silt. The *in situ* water contents of the silts appear to be relatively low (<30%). However, they are below the water table, so it is likely that they will gain water as they are disturbed during excavation. These materials will likely require dewatering and drying after excavation if they are to be placed in locations requiring them to hold slopes or support construction equipment. Careful sequencing of the excavation to allow for quick excavation of the deepest channel sections at the bottom of the clay layer, which is likely below the water table, and the silts should reduce dewatering issues.

In areas where it appears that Ninemile Creek may have historically occupied the floodplain at each end of proposed channel, it appears that the clay layer is thinner and there is more sand and silt in the profile. The relatively sandy materials may dewater well.

5.0 REACH CD CHANNEL

The upper portion of the Reach CD channel sediments (0 to 6-foot zone) was found to be typically a low to high plasticity clay with liquidity indices of 1 to 2 as tested in the NMC-TP-1A, NMC-TP-1B, and NMC-TP-1C bulk samples. NMC-TP-1B was obtained from the top 6 feet in the south channel by the Large Island. This bulk sample is classified as a low plasticity clay with a liquidity index of about 2 indicating that it is very soft.

Composited sediment samples NMC-SED-C-02 through 06 from the south channel by the Large Island indicate that the sediments are highly variable ranging from clays to relatively clean sands, although organic content testing on one of the clean sand samples, NMC-SED-C03, indicated an organic content of about 5%, indicating that much of the fines may be made up of organic materials which can retain water. Individual samples obtained during the pre-design investigation in the south channel by the Large Island indicate that the materials below 6 feet tend to be non-plastic silts and silty sands. It is expected that the excavation process will generally blend the excavated materials so that much of the resulting material will have the properties of a wet silt or very soft clay similar to the bulk samples tested in the column testing program.

Composited samples NMC-SED-C07 through 010 obtained from sediment cores in the main channel of Reach CD indicate that these sediments are clays and silty sands. Samples NMC-SED-C-09 and C10 were tested for organic content and found to have organic contents of about 3% to 5%. These composited sand samples have relatively high water contents (27% to 62%) as tested in the laboratory indicating that they may not dewater as well as might normally be expected of sands, due to the elevated organic content. Similar to the south channel, it is expected that the excavation process will generally blend the excavated materials so that the resulting material will have the properties of a wet silt or very soft clay similar to the bulk samples tested in the column testing program.

The modified column testing program performed on the NMC-TP-1 composite sample indicated that there was virtually no flow from the sample in the column during the 48-hour test. An additional 4.5 gallons was entrained into the sample during the preparation process to mimic dredging underwater. At the end of the test, one gallon of water was drained off the top of the sample and only 0.1 gallon was recovered from drainage through the sample. This indicates that the already wet and soft clays absorbed the additional 3.5 gallons into the 19 gallon original volume. Nearly all of the material in the column did not pass the paint filter test at the end of 48 hours.

It does not appear that the sediments removed from the Ninemile Creek channel in Reach CD, including the materials in the south channel by the Large Island, will dewater by gravity. It is likely that solidification or mixing with dry materials will be required for these materials to be transported and placed.

6.0 REACH BC CHANNEL

The primary data available for material handling characteristics of the Reach BC channel sediments are the three bulk samples obtained in 2009, NMC-TP-3A, NMC-TP-3B, and NMC-TP-3C. NMC-TP-3A, obtained near the top of Reach BC, by the Pump Station Road exit ramp, is characterized as a sandy low plasticity silt. NMC-TP-3B, obtained near the middle of Reach BC, between the Pump Station Road exit ramp and the utility bridge, is characterized as a silty sand. The fines are plastic and are at the border between low to high plasticity. NMC-TP-3CA, obtained near the bottom of Reach BC, between the I-695 flyover ramps, is characterized as a clayey gravel with sand. The fines are low plasticity clay. This sample has a fines content of only about 20%, so this material may be relatively strong overall since the gravel and sand may all have point-to-point contact with the fines simply filling in the voids unlike the other two samples.

All three of these samples have liquidity indices greater than 1, indicating the fines are very soft. The modified column testing program performed on the NMC-TP-3 Composite sample had an additional 4.5 gallons entrained into the sample during the preparation process to mimic dredging underwater. The measurements during the column testing indicated that approximately 2.5 gallons drained from the sample in the column during the 48-hour test. At the end of the test, 1.9 gallons of water was drained off the top of the sample. This indicates that the sediments in Reach BC did not entrain the added water and either drained it or ponded it on the sediment surface where surface drainage could remove it. The sample was continuing to drain at the end of the 48 hours. Nearly all of the material in the column did pass the paint filter test at the end of 48 hours. It appears that the sediments removed from the Ninemile Creek channel in Reach BC may be amenable to gravity dewatering, particularly the materials from the middle and lower part of the Reach that have significant sand and gravel contents. Some of these materials, such as NMC-TP-3C, may have sufficient point-to-point content of the sand and gravel that minimal dewatering would be required to allow for initial placement of the material. Mixing with dry bank materials may be sufficient to allow for immediate transport and placement.

The materials with little sand or gravel will likely require solidification or extensive mixing with dry materials to allow for transported placement.

7.0 REACH AB CHANNEL

Composited samples NMC-SED-C21 through C26 obtained from sediment cores in the Reach AB channel indicate that the creek sediments above the marl layer where present, are low plasticity silts and silty sands. These sediments have relatively high water contents of 46% to 93%. The silty sand samples have fines contents greater than 25%, indicating that they likely have a relatively low permeability and their engineering properties would be controlled by the fines.

Composited samples NMC-SED-C15 through C20 obtained from sediment cores in the Reach AB channel were identified as plastic marls and non-plastic marls. The plastic marls are classified as low plasticity clays. The non-plastic marls have gradations of sandy silts. The marls generally have water contents of 38% to 68% with an outlier point of 688%. Organic content testing on the marls indicates organic contents of about 1% to 3%.

Column testing was not performed on samples from Reach AB. However, it is likely that the column testing results would have shown limited dewatering of the sediments, more similar to the NMC-TP-1 composite results than the NMC-TP-2 composite results. It is expected that the materials would show limited dewatering during a 48-hour period and would likely require solidification or mixing with dry materials for transportation and placement.

8.0 SUMMARY

Bank Materials

The bank soils consist of a variety of materials, primarily silts and clays. It is expected that these bank materials will be relatively dry above the waterline and suitable for immediate transportation and placement after excavation. They may be sufficiently dry to be used for mixing with sediment to absorb excess water from the sediment for transportation and/or placement. However, if the bank soils fall into the creek or are otherwise exposed to water, they will likely absorb significant water, be difficult to dewater, and may require solidification for transportation and placement.

Reach CD Floodplain

Samples from the Reach CD floodplain indicate that localized sand deposits and other surface soils are present in the Reach CD floodplain above underlying glacio-lacustrine clay, which is present in the upper 4 to 9 feet. The generally stiff to hard low plasticity glacio-lacustrine clay generally has a high organic content; soils with these characteristics typically have a high water holding capacity. At the time of sampling, the water content of these soils was generally at about the plastic limit, and slightly above the optimum moisture content for compaction.

Soils with water content near the plastic limit or slightly above the optimum moisture content are suitable for direct loading into trucks and compaction with standard construction equipment. When excavated, the glacio-lacustrine clays will not require dewatering and should

be compactable to a dense fill condition at the excavated moisture content, provided that they are protected from water addition due to precipitation or flooding.

In their undisturbed condition, the glacio-lacustrine clays immediately underlying the surface soils and sediments should provide a good working surface for construction vehicles in dry weather. However, equipment traffic in wet conditions will cause these clays to lose their relatively high strength, about 1 foot or so at a time, making trafficability poor. Seal-rolling exposed surfaces will support maintaining a good traffic surface.

Non-plastic silts underlie the glacio-lacustrine clay. The in-situ water content of the silts appear to be relatively low (<30%). However, the silts are below the water table, so it is likely that they will gain water as they are disturbed during excavation. These materials will likely require dewatering and drying if they are to be placed in locations requiring them to hold slopes or support construction equipment.

Reach CD Channel

The upper portion of the Reach CD channel (0 to 6-foot zone) was found to be typically a low to high plasticity clay with liquidity indices of 1 to 2. There are areas with relatively clean sands, although organic content testing on one of the clean sand samples indicated an organic content of about 5%, indicating that much of the fines may be made up of organic materials which can retain water. Samples obtained during the pre-design investigation in the south channel by the Large Island indicate that the soils below 6 feet tend to be non-plastic silts and silty sands.

It is expected that the excavation process will generally blend excavated materials, so that much of the resulting material will have the properties of a wet silt or very soft clay, similar to the bulk samples tested in the column testing program. It does not appear that the sediments to be removed from the Ninemile Creek Reach CD channel will dewater by gravity; solidification or mixing with dry soils will likely be required. After solidification or mixing with dry soils, the sediment would be suitable for transport by trucks and could be placed and compacted to provide stable slopes and firm subgrade to support a soil cover system.

Reach BC Channel

At the upper end of Reach BC, in the vicinity of the Pump House Road exit ramp, the channel sediment is characterized as sandy low plasticity silt. In the middle of Reach BC, between the Pump House Road exit ramp and the utility bridge, the sediment is characterized as silty sand. At the lower end of Reach BC, in the area of the I-695 flyover ramps, the sediment is characterized as clayey gravel with sand, with about 20% fine-grained sediment particles. The fines are low plasticity clay. Sediment in the lower reach may be relatively strong overall since the gravel and sand may all have point-to-point contact with the fines simply filling in the voids. The sediment in Reach BC has liquidity indices greater than 1, indicating the fines are very soft.

It appears that the sediments removed from the Ninemile Creek channel in Reach BC may be amenable to gravity dewatering, particularly the materials from the middle and lower part of the Reach that have significant sand and gravel contents. Some of these materials may have sufficient point-to-point content of the sand and gravel that minimal dewatering would be required to allow for initial placement of the material. Mixing with dry bank materials may be sufficient to allow for immediate transport and placement. However, the sediment with little sand or gravel will likely require solidification or mixing with dry materials in order to make them suitable for transport.

Reach AB Channel

In the Reach AB channel, the sediments above the area-wide marl layer consist of low plasticity silts and silty sands. These sediments have relatively high water content and have fines contents greater than 25%. Therefore, this sediment will be difficult to dewater and will be difficult to compact in a consolidation area. This material will likely require solidification or mixing with dry materials in order to make it suitable for transport and placement.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The Ninemile Creek bank and Reach CD floodplain soils above the creek water level are generally expected to be suitable for transportation and placement provided that contact with surface water and substantial exposure to precipitation is prevented when they are disturbed. Directly loading these materials into trucks upon excavation should generally be feasible. These materials will be difficult to dewater if allowed to entrain significant additional water during disturbance and excavation. Allowing water entrainment could require solidification of the materials for transportation and disposal.

The channel sediments in Reaches CD and AB are expected to be difficult to dewater. It is also expected that sufficient water will be entrained in the sediments based on their *in situ* condition and due to disturbance during dredging to make them fail paint filter tests and unsuitable for holding slopes or supporting equipment in an unstabilized condition. The high water content and expected difficult dewatering is expected to require solidification or mixing with dry materials to allow them to be and placed at the LCP OU-1 Containment Area.

The channel sediments in Reach BC appear to have better dewatering characteristics than the other areas. They also appear to be significantly coarser with significant sand and gravel contents. It is possible that these sediments may be able to be dewatered after excavation to a point where transportation and placement is feasible without solidification.

TABLE 1
NINEMILE CREEK MATERIAL MANAGEMENT
SUMMARY OF MATERIAL PROPERTIES AND DEWATERING(1)

	Reach CD Floodplain	Reach CD Channel	Reach BC Channel	Reach AB Channel
Sediment type	Stiff to hard, low plasticity CLAY Water content (WC) near plastic limit (PL) Below 4 to 9 ft., non-plastic SILT with WC < 30%	Soft, low plasticity CLAY with liquidity index (LI) of 2. Below 6 ft., non-plastic silts and silty SAND, but variable from sand to clay.	Sandy SILT with low plasticity; silty SAND; and clayey GRAVEL with sand.	Low plasticity SILT and silty SANDS with WC of 46 to 93%. Silty sand, have > 25% fines.
Modified column results	Added water adsorbed by sediment and poor drainage	No flow from sample in 48 hours. Added 4.5 gallons to sediment and about 1.0 gallons drained. Failed paint filter test after 48 hours.	2.5 gallons drained during 48 hour tests. Added 4.5 gallons and 1.9 gallons drained from top. Passed paint filter test after 48 hours.	Expect behavior similar to TP-1 (Reach CD Channel) based on physical properties.
Predicted behavior	Clay good for transport and fill if kept at *in situ* WC. If WC increases, clay will be soft and difficult to place. Silt is below water table, so will be saturated and require drying prior to placing.	Sediments dredged will drain slowly; therefore, solidification or mixing with dry materials will likely be required.	Sediments will likely drain by gravity and contain sufficient sand and gravel to allow transport and fill placement. Some sediment with little sand or gravel may require solidification.	Sediments dredged will drain slowly; therefore solidification or mixing with dry materials will likely be required (if mechanical dredging used). Place into geotextile tubes if hydraulic dredge is used.

Notes:
(1) Source Data from available test pits, boring, and geotechnical testing as described in the *Ninemile Creek Pre-Design Investigation Report* (Parsons, 2010b).

ATTACHMENT A

TEST RESULTS AND SAMPLE LOCATIONS

Index of Attachments:

- Table B-2-1 – Index Testing
- Table B-2-2 – Column Settling Testing
- Graph B-2-1 – Material Management – Plasticity Chart
- Graph B-2-2 – Grain Size Distribution – Reach CD existing floodplain
- Graph B-2-3 – Grain Size Distribution – Reach CD existing channel
- Graph B-2-4 – Grain Size Distribution – Reach BC channel
- Figure 2 from WP #8 – Geotechnical and Hydrogeologic Reach CD Sample Locations
- Figure 3 from WP #8 – Geotechnical and Hydrogeologic Reach BC Sample Locations
- Figure 4 from WP #8 – Geotechnical and Hydrogeologic Reach AB Sample Locations
- Figure B-2-1 Amended from WP #10 – Channel Sediment Reach CD Sample Locations
- Figure B-2-2 Amended from WP #10 – Channel Sediment Reach BC Sample Locations
- Figure B-2-3 Amended from WP #10 – Channel Sediment Reach AB Sample Locations
- Laboratory Supplied Data and Column Testing

TABLE B-2-1
Index Testing

	Location ID	Depth	USCS/Material	Water Content	Atterberg Limits				Organic Content	Activity
					Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index		
				(%)	(%)	(%)	(%)	(%)	(%)	
Reach CD Existing Channel	NMC-SED-C02		CL	30.4	35	18	17	0.7		0.6
	NMC-SED-C03		SP	31					4.8	
	NMC-SED-C04		SW	35.7						
	NMC-SED-C05		ML	51.9	51	27	24	1.0		1.2
	NMC-SED-C06		ML	43.9	42	24	18	1.1	4.1	0.7
	NMC-PZ-09	0-2	SC	52.8	36	24	12	2.40	4.1	1.46
	NMC-PZ-09	2-4	ML	26.3	NP	NP	NP		1.4	
	NMC-TP-1A	0-6	CL	55.5	64	29	35	0.8	6.5	5.0
	NMC-TP-1B	0-6	CL	42.9	33	18	15	1.7	1.3	0.4
	NMC-TP-1C	0-6	CL	62.2	42	25	17	2.2	2.5	1.0
	NMC-TP-1	0-6	CL	57.6	44	24	20	1.7	3.3	
	NMC-SED-C07		CL	27.7	36	15	21	0.6		0.5
	NMC-SED-C08		SP	61.9						
	NMC-SED-C09		SW	61					5.0	
	NMC-SED-C10		SW	27					2.9	
Reach CD Floodplain	NMC-SB-028	7-9	CL	24.2	35	20	15	0.28	0.6	0.49
	NMC-SB-029	5-7	CL	23.2	40	19	21	0.20	0.8	0.49
	NMC-SB-030	5-7	Silty Clay w Sand & Org's	109.7					10.3	
	NMC-TP-2A	0-4	CL	28.6	42	25	17	0.2	3.8	0.4
	NMC-TP-2B	0-4	CL	23.6	45	21	24	0.1	1.5	0.6
	NMC-TP-2C	0-4	CL	21.8	41	23	18	-0.1	7	0.4
	NMC-TP-2	0-4	CL	24.6	42	21	21	0.2	3.4	
	NMC-SED-C11		CL	22.7	39	18	21	0.2		0.4
	NMC-SED-C12		SW	37.1						
	NMC-SED-C13		SW	0					5.0	
	NMC-SED-C14		ML	34.3	41	27	14	0.5	3.8	0.6
Reach BC Channel	NMC-PZ-12	0-2	Silty Sand w Gravel	54.3					3.4	
	NMC-PZ-12	2-4	Silty Sand w Organics	71.4					5.5	
	NMC-PZ-12	4-6	Silty Sand w Gravel	12.2					0.2	
	NMC-PZ-14	2-4	Silty Sand	15.7					3.3	
	NMC-PZ-14	0-2	Silty Sand w Gravel & Org's	19.8					6.6	
	NMC-TP-3A	0-3	ML	85.3	37	27	10	5.8	2.9	1.8
	NMC-TP-3B	0-3	SM	73.5	50	33	17	2.4	3.6	4.9
	NMC-TP-3C	0-3	GC	29.5	27	19	8	1.3	2.6	1.8
	NMC-TP-3	0-3		40.9	46	31	15	0.7	3	
Reach AB channel sediment to 6+00	NMC-SED-C15		MARL	38	27	19	8	2.4		0.6
	NMC-SED-C16		MARL	38.1	30	19	11	1.7		0.6
	NMC-SED-C17		MARL	37.8	28	19	9	2.1	0.9	0.5
	NMC-SED-C18		MARL	67.7						
	NMC-SED-C19		MARL	65.9						
	NMC-SED-C20		MARL	688					2.7	
	NMC-SED-C21		SAND above marl	51.5						
	NMC-SED-C22		SAND above marl	52.6						
	NMC-SED-C23		SAND above marl	45.6					3.1	
	NMC-SED-C24		SILT above Marl	89.7	43	41	2	24.4		0.1
	NMC-SED-C25		SILT above Marl	93	44	29	15	4.3		0.9
	NMC-SED-C26		SILT above Marl	81.9	39	28	11	4.9	2.9	0.7

TABLE B-2-2
Column Settling Testing

Modified Column Settling Test

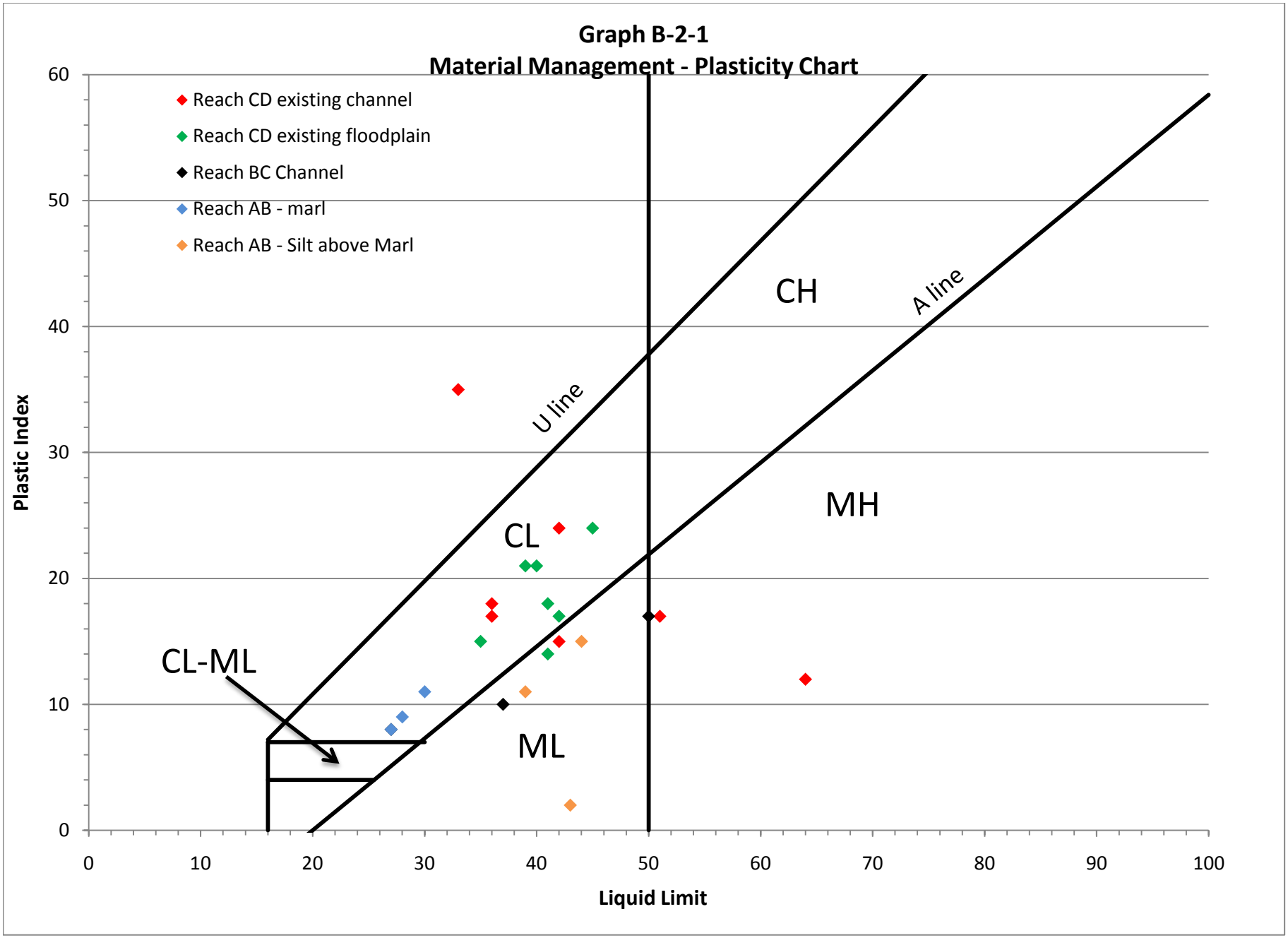
Location ID	Depth	Water Content after Test (%)				Liquidity Index		Flow		
	(ft)	Top	Top 1/3	Base 1/3	Base	Top	Top 1/3	Top 1/3	Base 1/3	Base
NMC-TP-1	0-6	102.0	68.5	51.2	44.2	3.9	2.2	Flow	Flow	No Flow
NMC-TP-2	0-4	46	43.8	43.1	40.9	1.2	1.1	No Flow	No Flow	No Flow
NMC-TP-3	0-3	123	45.5	37.6	31.3	6.1	1.0	No Flow	No Flow	No Flow

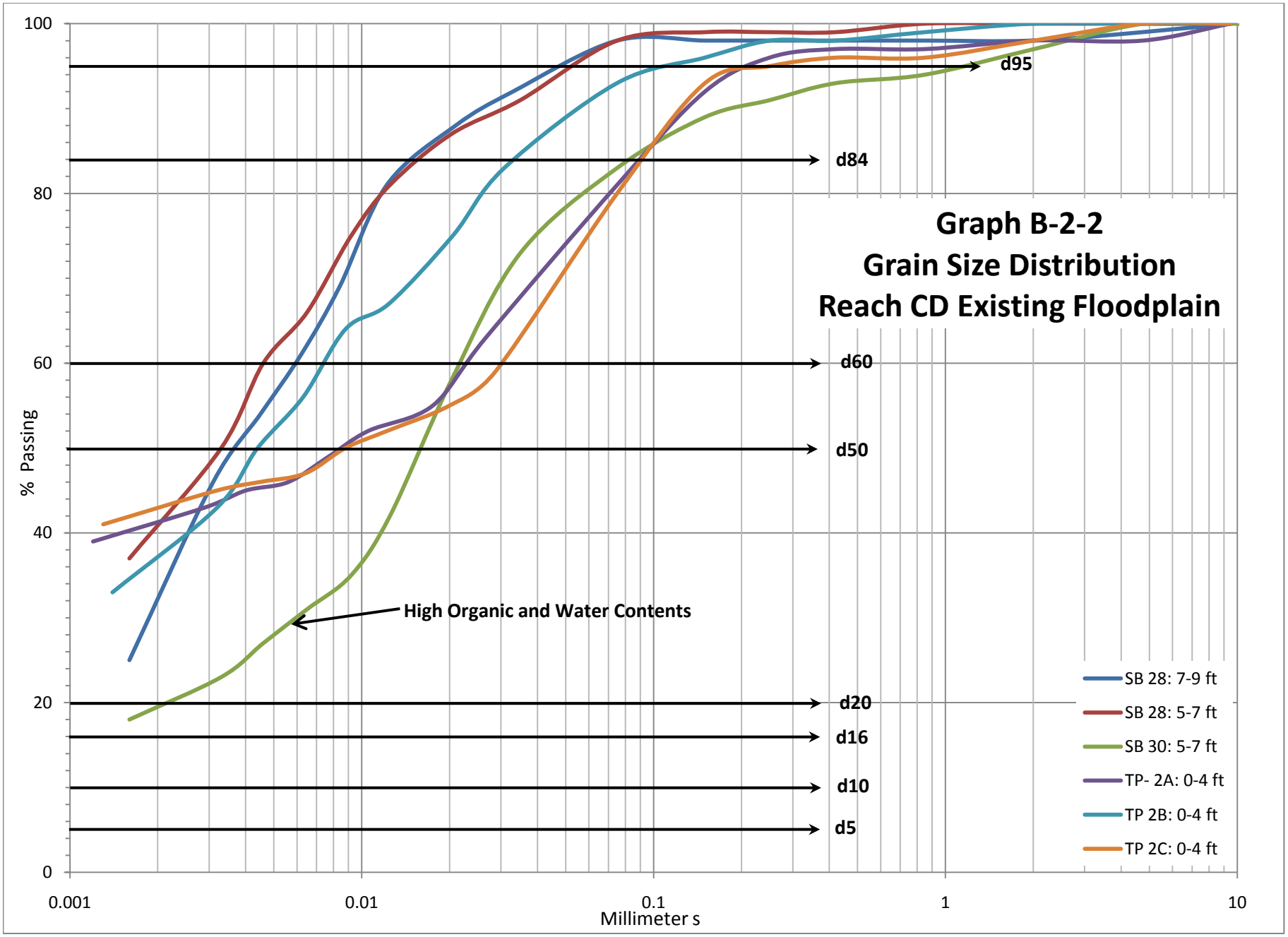
California Bearing Ratio - performed on Modified Column Material

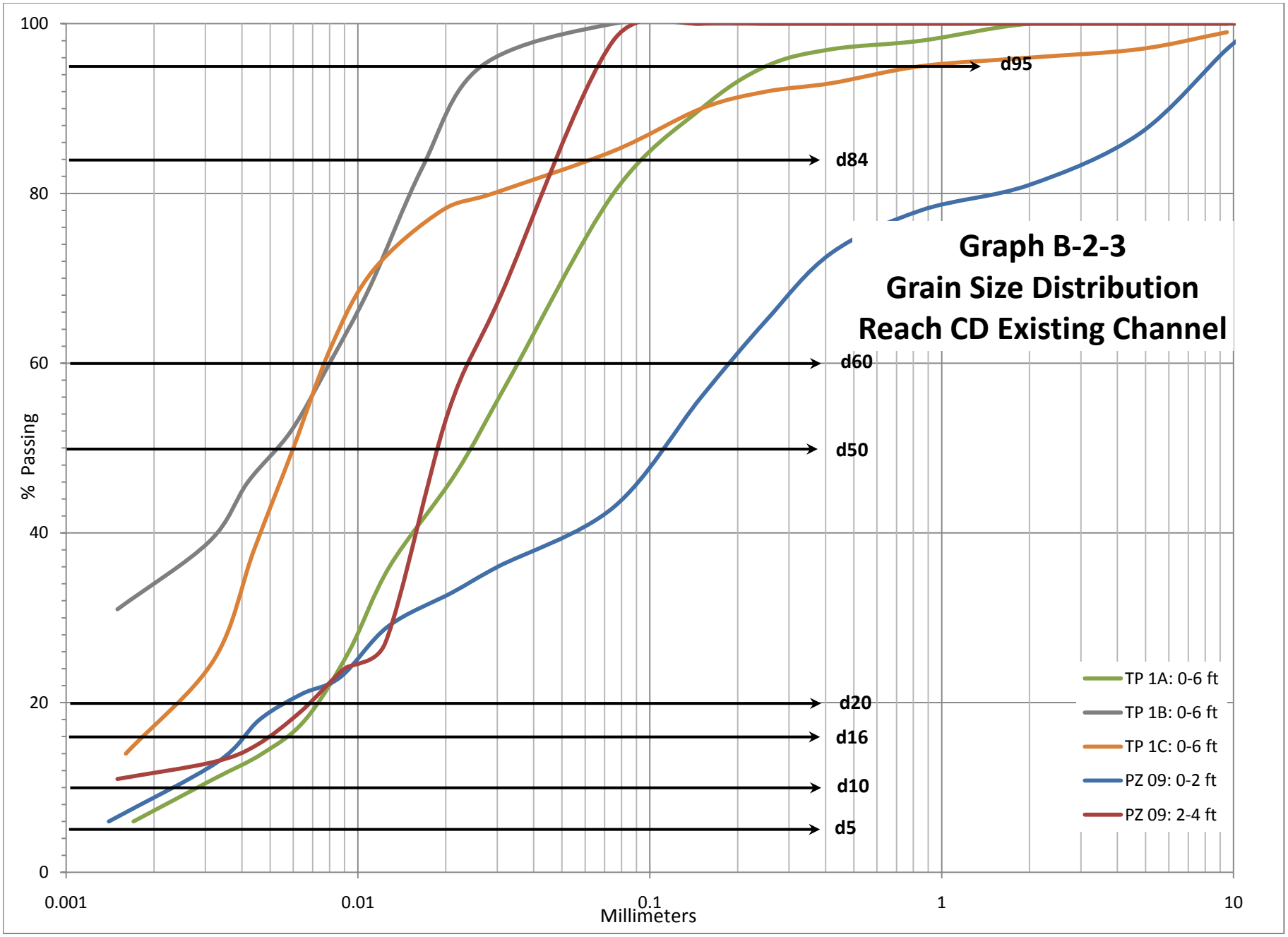
Location ID	Depth	Test	Penetration				
	(ft)	Condition	0.1"	0.2"	0.3"	0.4"	0.5"
NMC-TP-1	0-6	Immediate-No Soaking	1	NA	NA	NA	NA
NMC-TP-1	0-6	Soaked for 96 hrs	0	0	0	0	0
NMC-TP-2	0-4	Immediate-No Soaking	0	0	0	0	0
NMC-TP-2	0-4	Soaked for 96 hrs	0	0	0	0	0
NMC-TP-3	0-3	Immediate-No Soaking	0	0	0	NA	NA
NMC-TP-3	0-3	Soaked for 96 hrs	1	1	1	1	1

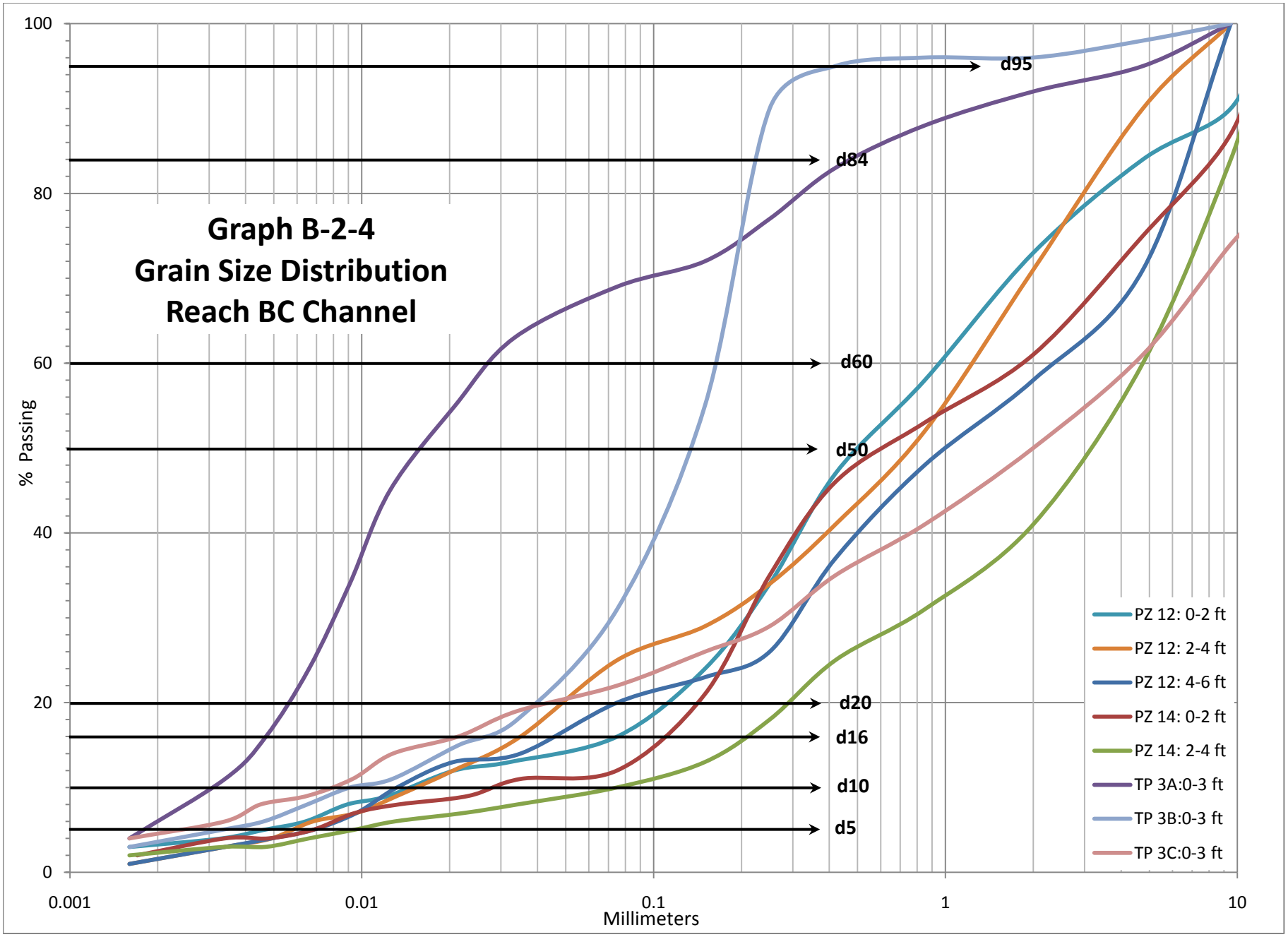
Compaction

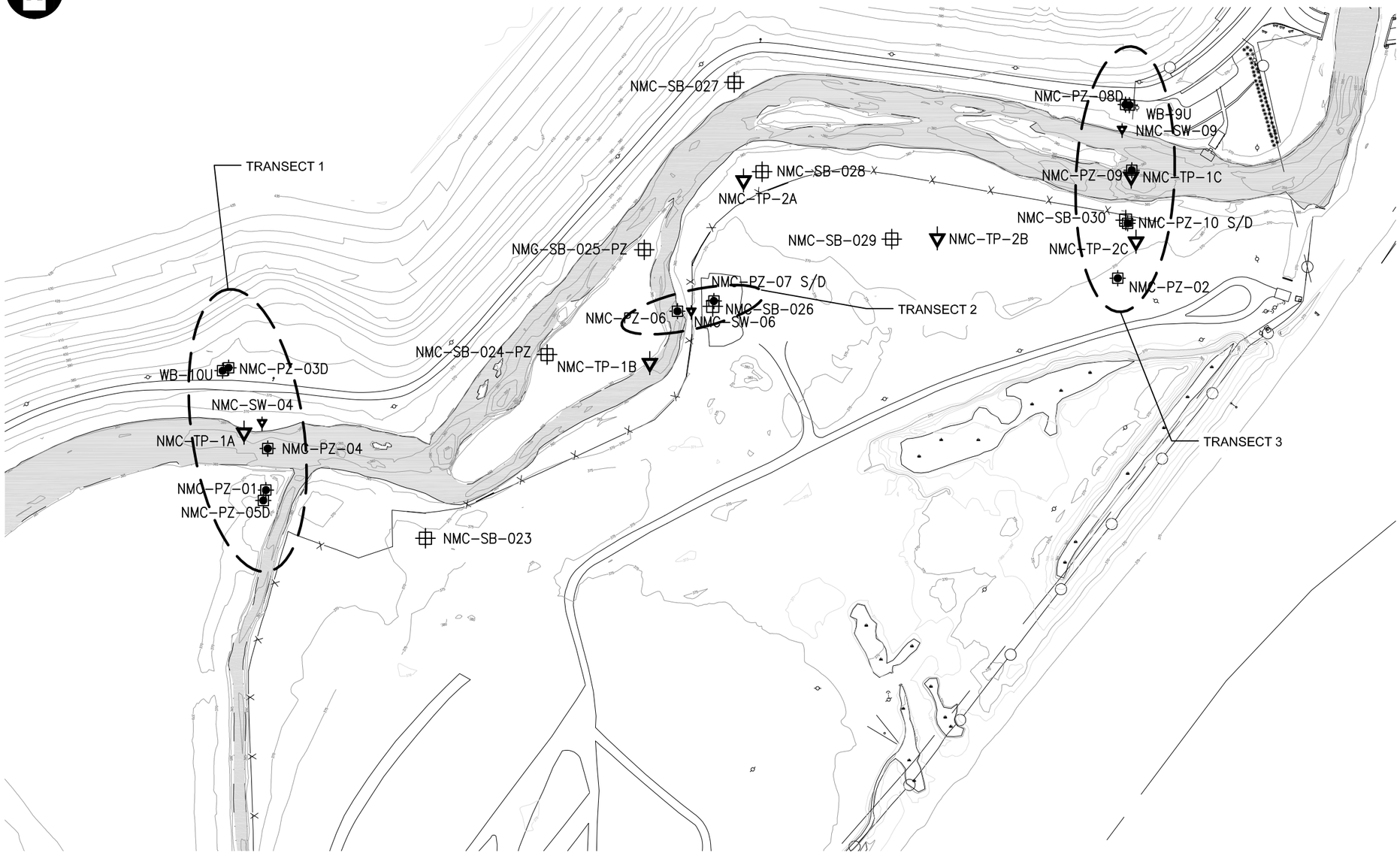
Location ID	Depth	Max Dry Density	Optimum w
	(ft)	(pcf)	(%)
NMC-TP-1	0-6	102	19
NMC-TP-2	0-4	102	19.5
NMC-TP-3	0-3	103.5	19


Graph B-2-1
Material Management - Plasticity Chart
Reach CD existing channel
Reach CD existing floodplain
Reach BC Channel
Reach AB - marl
Reach AB - Silt above Marl
CH
A line
U line
MH
CL
CL-ML
ML
Plastic Index
Liquid Limit
0
10
20
30
40
50
60
70
80
90
100


Graph B-2-2
Grain Size Distribution
Reach CD Existing Floodplain
% Passing
Millimeter s
100
80
60
40
20
0
0.001
0.01
0.1
1
10
d95
d84
d60
d50
d20
d16
d10
d5
High Organic and Water Contents
SB 28: 7-9 ft
SB 28: 5-7 ft
SB 30: 5-7 ft
TP- 2A: 0-4 ft
TP 2B: 0-4 ft
TP 2C: 0-4 ft


Graph B-2-3
Grain Size Distribution
Reach CD Existing Channel
100
80
60
40
20
0
% Passing
0.001
0.01
0.1
1
10
Millimeters
d95
d84
d60
d50
d20
d16
d10
d5
TP 1A: 0-6 ft
TP 1B: 0-6 ft
TP 1C: 0-6 ft
PZ 09: 0-2 ft
PZ 09: 2-4 ft


Graph B-2-4
Grain Size Distribution
Reach BC Channel
% Passing
Millimeters
100
80
60
40
20
0
0.001
0.01
0.1
1
10
d95
d84
d60
d50
d20
d16
d10
d5
PZ 12: 0-2 ft
PZ 12: 2-4 ft
PZ 12: 4-6 ft
PZ 14: 0-2 ft
PZ 14: 2-4 ft
TP 3A:0-3 ft
TP 3B:0-3 ft
TP 3C:0-3 ft



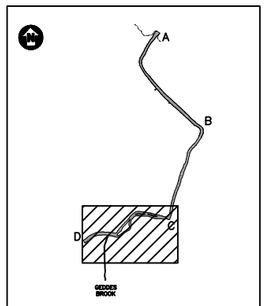
LEGEND

370 CONTOURS

WATER BOUNDARY OR STREAM

WORK PLAN #8 SAMPLE LOCATIONS

- PIEZOMETER LOCATIONS
- MATERIAL HANDLING SAMPLE LOCATIONS
- GEOTECHNICAL BORING LOCATIONS
- STILLING WELL LOCATIONS



KEY PLAN

PRELIMINARY DRAFT

160 80 0 160 320

SCALE: 1"=160'

FIGURE 2

Honeywell

GEDDES BROOK/NINEMILE CREEK
SOLVAY, NEW YORK

WORK PLAN #8
GEOTECHNICAL AND HYDROGEOLOGIC
REACH C–D
SAMPLE LOCATIONS

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL –SYR\444286 NINE MILE\TECHNICAL\CAD\PDI–DATA SUMMARY\444286SK001_1_1_3629.DWG
PLOT DATE: 2/12/2010 9:04 AM PLOTTED BY: SIVALIA, JACK

370 CONTOURS

WATER BOUNDARY OR STREAM

RAILROAD

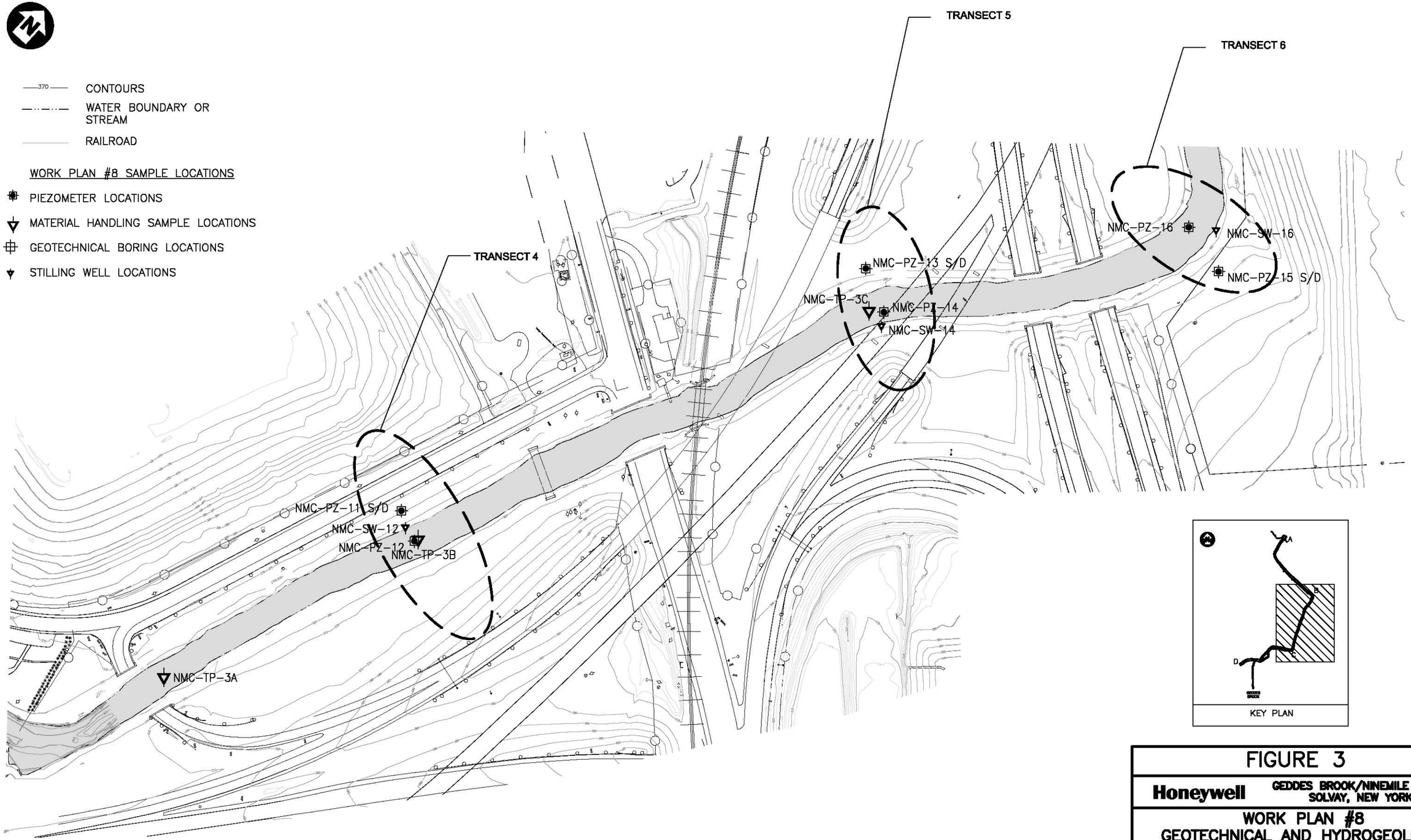
WORK PLAN #8 SAMPLE LOCATIONS

PIEZOMETER LOCATIONS

MATERIAL HANDLING SAMPLE LOCATIONS

GEOTECHNICAL BORING LOCATIONS

STILLING WELL LOCATIONS



KEY PLAN

160 80 0 160 320

SCALE: 1"=160'

PRELIMINARY DRAFT

FIGURE 3

Honeywell

GEDDES BROOK/NINEMILE CREEK
SOLVAY, NEW YORK

WORK PLAN #8
GEOTECHNICAL AND HYDROGEOLOGIC
REACH B–C
SAMPLE LOCATIONS

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL –SYR\444286 NINE MILE\TECHNICAL\CAD\PDI–DATA SUMMARY\444286SK001_1_1_3629.DWG
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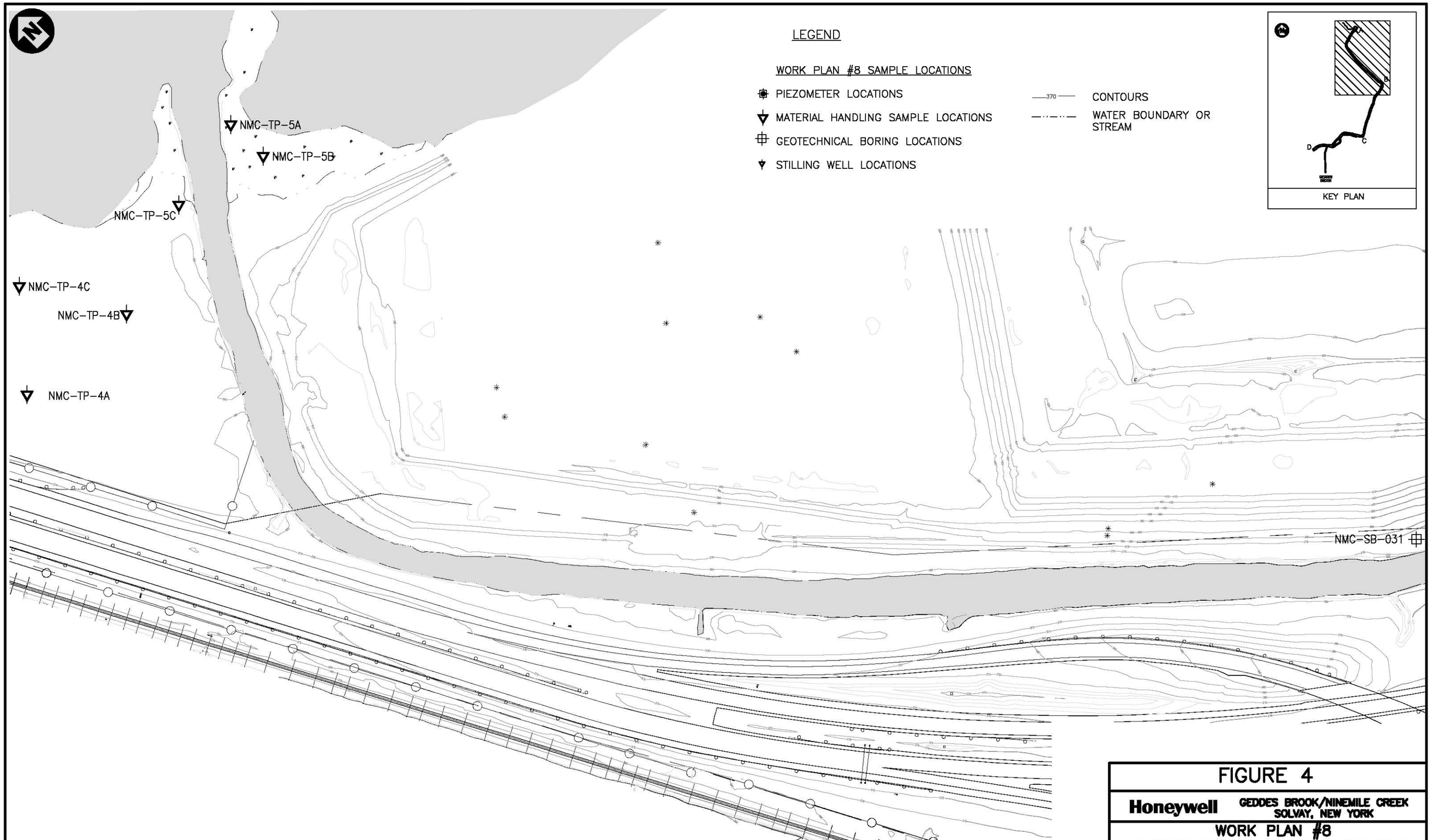


PRELIMINARY DRAFT

FIGURE 4

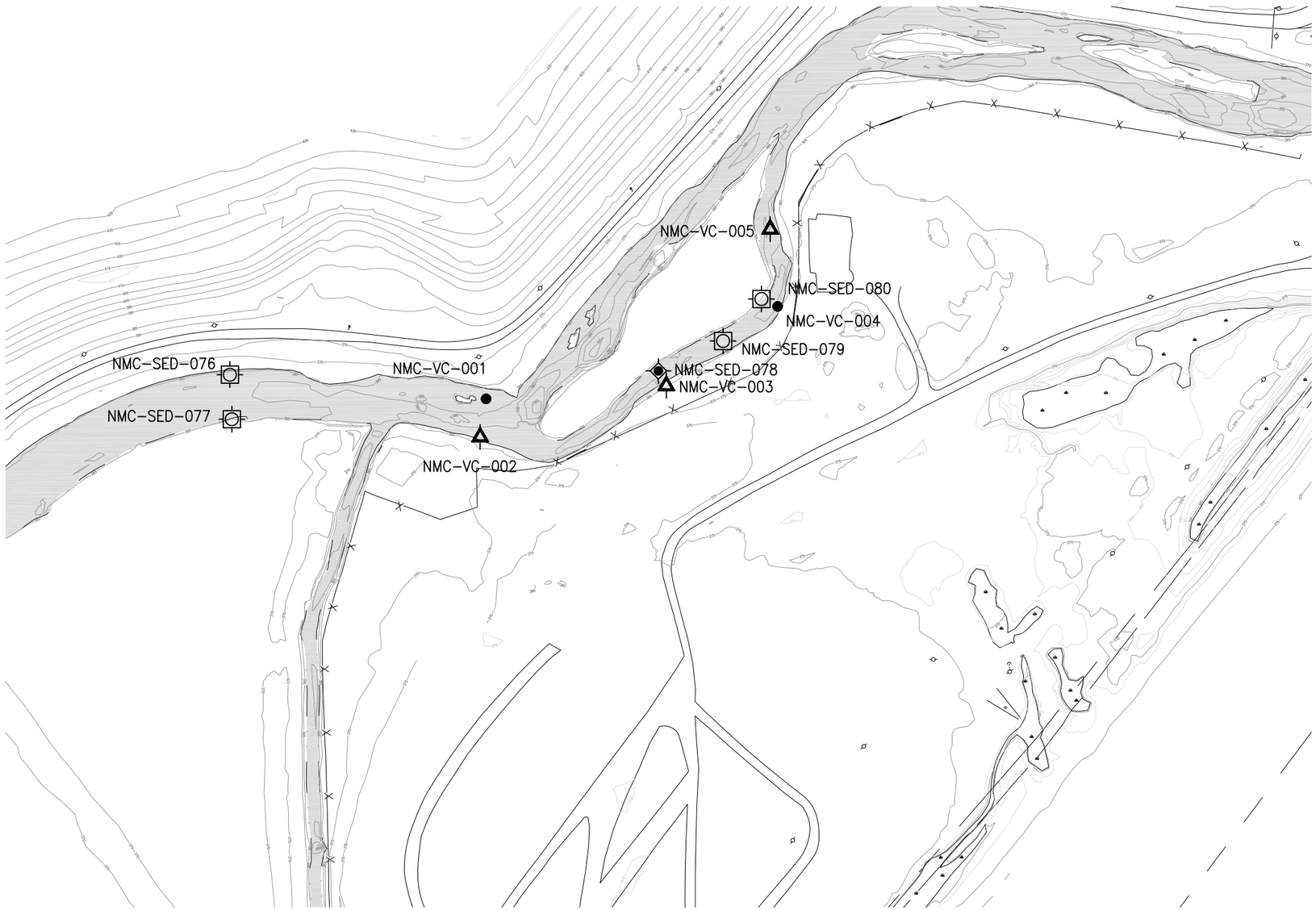
Honeywell

GEDDES BROOK/NINEMILE CREEK
SOLVAY, NEW YORK

WORK PLAN #8
GEOTECHNICAL AND HYDROGEOLOGIC
REACH A–B
SAMPLE LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL –SYR\444286 NINE MILE\TECHNICAL\CAD\PDI–DATA SUMMARY\444286SK001_1_1_3629.DWG
PLOT DATE: 2/12/2010 9:05 AM PLOTTED BY: SIVALIA, JACK



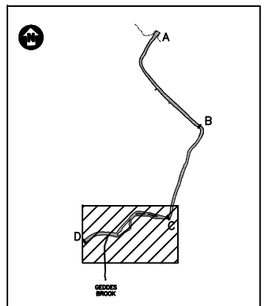
LEGEND

370 CONTOURS

WATER BOUNDARY OR STREAM

WORK PLAN #10 SAMPLE LOCATIONS

- CHANNEL SEDIMENT (MERCURY AND OTHER CPOIs) SAMPLE LOCATION
- CHANNEL SEDIMENT (MERCURY) SAMPLE LOCATIONS
- CHANNEL SEDIMENT (MERCURY & OTHER CPOIs) AND POREWATER (MERCURY) SAMPLE LOCATIONS
- CHANNEL SEDIMENT (MERCURY) AND POREWATER (MERCURY) SAMPLE LOCATIONS



KEY PLAN

160 80 0 160 320

SCALE: 1"=160'

FIGURE B-2-1

Honeywell GEDDES BROOK/NINEMILE CREEK SOLVAY, NEW YORK

WORK PLAN #10
CHANNEL SEDIMENT REACH CD
SAMPLE LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\444286 NINE MILE\TECHNICAL\CAD\PDI-DATA SUMMARY\444286SK005.DWG
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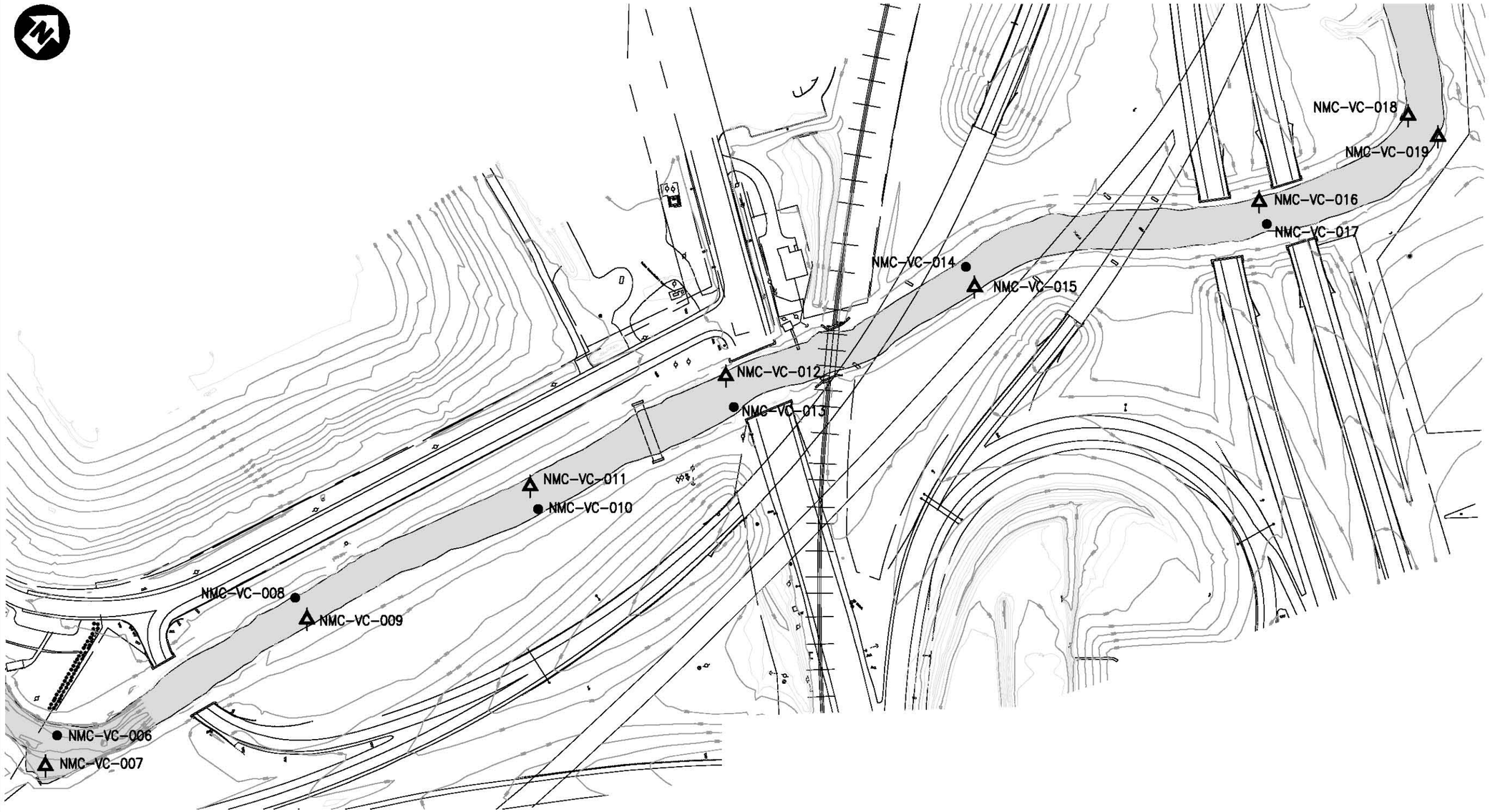

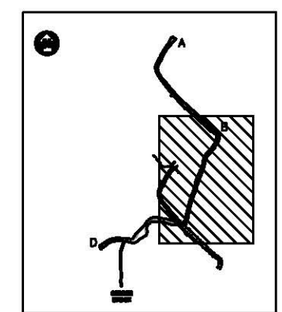

KEY PLAN

160 80 0 160 320

SCALE: 1"=160'

370 CONTOURS

WATER BOUNDARY OR STREAM

WORK PLAN #10 SAMPLE LOCATIONS

CHANNEL SEDIMENT (MERCURY AND OTHER CPOIs) SAMPLE LOCATION

CHANNEL SEDIMENT (MERCURY) SAMPLE LOCATIONS

CHANNEL SEDIMENT (MERCURY & OTHER CPOIs) AND POREWATER (MERCURY) SAMPLE LOCATIONS

CHANNEL SEDIMENT (MERCURY) AND POREWATER (MERCURY) SAMPLE LOCATIONS

FIGURE B-2-2

Honeywell

GEDDES BROOK/NINEMILE CREEK
SOLVAY, NEW YORK

WORK PLAN #10
CHANNEL SEDIMENT
REACH BC SAMPLE LOCATIONS

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\444286 NINE MILE\TECHNICAL\CAD\PDI-DATA SUMMARY\444286SK005.DWG
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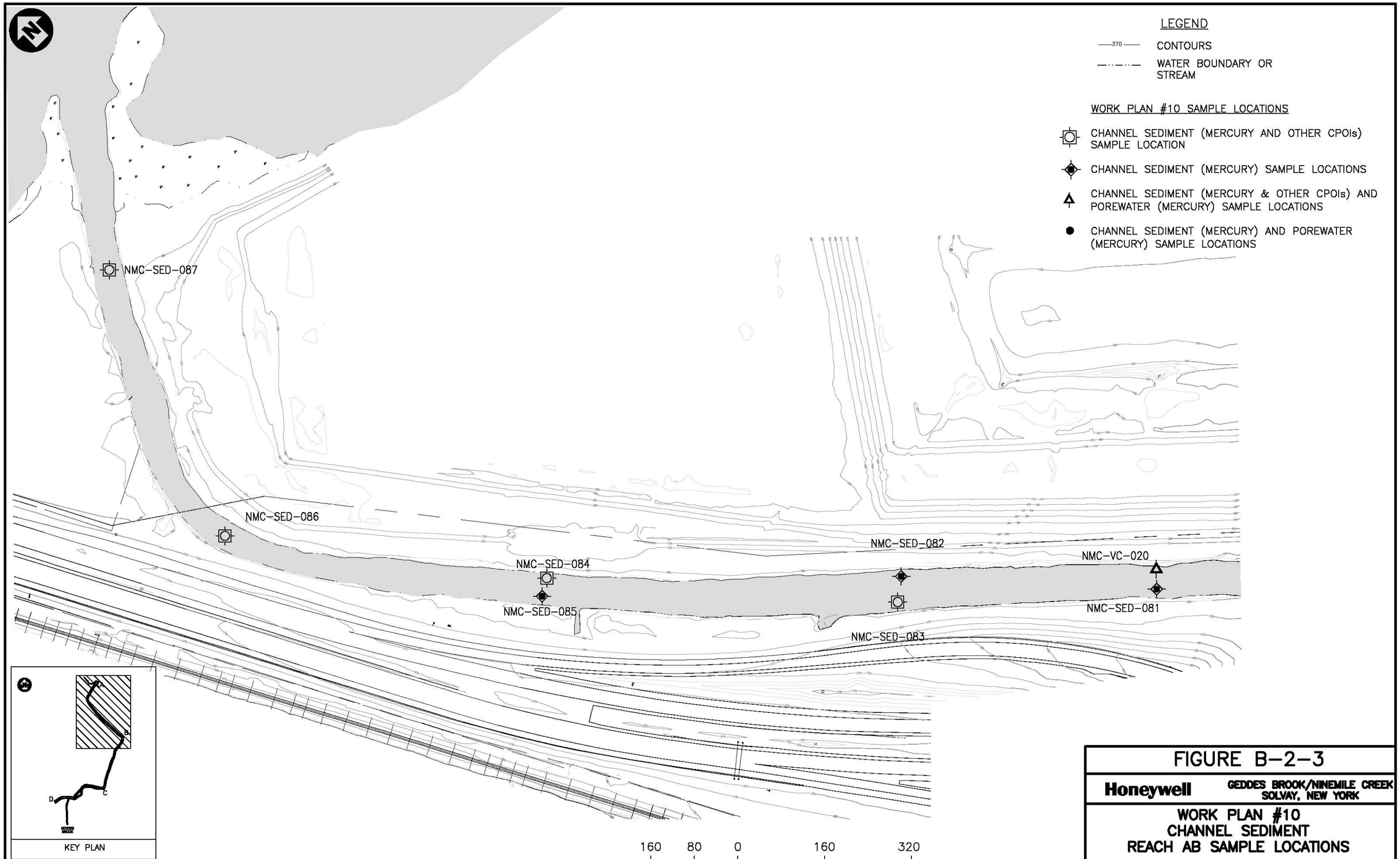

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PLOT DATE: 1/14/2011 11:15 AM PLOTTED BY: RUSSO, JILL

FIGURE B-2-3

Honeywell

GEDDES BROOK/NINEMILE CREEK
SOLVAY, NEW YORK

WORK PLAN #10
CHANNEL SEDIMENT
REACH AB SAMPLE LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-6560