EAST DELAVAN PROPERTY, LLC

333 Ganson Street • Buffalo, New York 14203 | Phone 716.856.3333 • FAX 716.842.1785

February 17, 2017

Chad Staniszewski, PE
Regional Hazardous Waste Remediation Engineer
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, NY 14203-2999

Re: Transmittal
Preliminary Work Plan, Comments and Responses
Former American Axle Site
Buffalo, New York
Site No. 915196

Dear Mr. Staniszewski:

Thank you for your letter of January 23 and taking the time to speak to us on January 30, 2017, providing us with an understanding of the results of the New York State Department of Environmental Conservation (NYSDEC) review of the draft Preliminary Work Plan (PWP) as submitted by East Delavan Properties, LLC (EDP) for the above referenced site dated November 18, 2016. The PWP was submitted as a requirement of the NYSDEC Scope of Work letter for the site dated October 19, 2016. Based upon the review of the Draft PWP and our discussions, the NYSDEC offered the following comments and East Delevan has provided our *response in the following italicized text*.

1. General Comment: Objectives of the Program.
   One of the objectives stated in the work plan is to submit a petition to delist the site. Our understanding of the intent of this program is to present information to support a petition to reclassify the site from the current Class 2 listing. Site reclassification does not necessarily infer delisting. The Department suggests any reference to site delisting in the work plan be changed to "site reclassification". The outcome of the site evaluation will be used to assess the merits of reclassifying the site to an appropriate class listing or delist.
   Our goal is to ultimately delist the site, but we understand that the next phase of the work at the site may result in a reclassification and we have revised the text of the draft PWP (Enclosed) to reflect that the outcome is intended to reclassify the site to an appropriate class listing or delist.
   The program should be implemented in accordance with all DER 10 requirements.
   The program will be implemented in accordance with DER-10. That has been the intent and DER-10 is specifically referenced in the revised text.

   The entity performing the field work, data assessment and reporting should be completed by a Qualified Environmental Professional under the direction of a Professional Engineer. The report should also be signed by a Professional Engineer attesting to its accuracy and

completeness. EDP should provide information on the entity that will complete the site evaluation and include credentials of the individuals who will be responsible for completing the site evaluation.

The draft PWP was prepared by a Professional Engineer. EDP has engaged Benchmark to conduct the well reconnaissance and condition survey and will obtain quotations for the PWP scope of work from two or more firms with Qualified Environmental Professionals to implement the program defined in the approved PWP. EDP will provide the NYSDEC with the credentials of the individuals who will be responsible for completing the site evaluation as soon as the consultant has been selected.

2. Task 1 involved the assessment of all wells, both on-site and off-site. This task is incomplete. Table 1 as submitted does not include an assessment of all monitoring wells within the boundary of the existing site as proposed by EDP. All wells from the initial RI should be included to make a full and comparable assessment of current site conditions at the site. There are several wells that have been excluded in the PWP that should be included for a full comparable assessment.

   The list included with the Draft PWP noted those wells that EDP was aware of following and initial site review. A systematic and detailed search of the Site was conducted between February 7 and 14 to identify all wells that exist at and in the immediate vicinity of the listed Site. A summary table of the wells that have been located is provided in the revised draft PWP.

   Before any wells are redeveloped and assessed for integrity, they should be gauged for groundwater and NAPL thickness, if present. The groundwater elevation and NAPL thickness, where measured, should be included in the initial well assessment.

   These measurements were collected during the well reconnaissance. EDP does not believe these measurements are representative of the occurrence of LNAPL in the environment as many of these well have not been developed or purged for 10 years. Three rounds of post development gauging are proposed in the PWP to provide representative measurements. A summary of the measurements collected during the February 2017 well reconnaissance is included in the revised draft PWP.

   NYSDEC's intent in the scope of work was to also include wells associated with the supplemental RI. However, a limitation was included in the proposed work plan to only evaluate wells within the listed site. For purposes of advancing this site evaluation, wells that are to be part of this work plan and subsequent efforts should include any wells within the immediate vicinity outside of the defined site limits that were used in the initial RI.

   EDP searched for the available wells in and around the Site. The revised draft PWP includes the suite of monitoring wells needed to evaluate the current conditions relative to the 10+ year old data set in the draft supplemental RI. The wells in the draft supplemental RI were installed over phases of investigation and under very different conditions than exist today. Not all wells in the supplemental RI are needed to characterize the current conditions at the Site.

3. Task 2 is to provide all data and information collected after EDP assumed ownership and control of the site. This task is incomplete.

   The NYSDEC was under the impression that sampling and monitoring of wells was ongoing on a limited basis in support of EDP's claim that groundwater conditions were improving. However, no monitoring by EDP was completed.

   All data collected by EDP has been provided to the NYSDEC and will be incorporated into the revised draft PWP for convenience. The ongoing monitoring that EDP

voluntarily conducted was of the liquids recovered from the B-26 Coolant Pit and the composite samples collected from the liquids recovered from the wells during the initial walk through to look for remaining wells. EDP was not a party to the Order for the monitoring of the wells at the Site. If GM or AAM collected additional samples from the wells, that data was not shared with EDP.

The Task 2 scope was to include all data and documentation concerning the trench and pit abandonment, especially within the vicinity of the listed site. The PWP does not include any reference to this sub-task item nor the requested information. For the trench/pit abandonment, information such as the depth and dimensions of the structure; contents contained within the structure (oil, water, sediment/sludge), amount of materials removed; documentation of disposal; sampling data for water, sediments, and oil; cleaning measures; documentation that pit/sump surfaces were free of PCBs, assessment of pit/sump integrity; backfill material and backfill sample data; and any other relevant information.

There were no pits or sumps within the listed Site other than the B-26 Coolant Pit. That pit is maintained as a source for the collection of groundwater and limited LNAPL collected by the system abandoned by GM. No other pits are in the vicinity of the listed Site.

Pits, sumps and trenches well outside the listed Site were, emptied of the liquids abandoned by GM and AMM, cleaned and backfilled. As these were abandoned features outside the listed Site, EDP cleaned and backfilled them as part of ongoing renovation of the overall property, not as a remedial measure under any program or within the scope of any Order. The December 3, 2015 letter to the NYSDEC detailing those activities is enclosed for your reference.

Within the limits of the site, the building was largely removed. As a result of the removal of these structures, roof drains and laterals that discharged to the 5 x 9 sewer were either removed or sealed.

4. Task 3 is to provide a work plan for a current groundwater assessment. In completing this task, sample analysis should include analysis of all PCB aroclors, not just the aroclors detected in previous investigations. Additionally, a representative subset of groundwater and LNAPL samples shall be analyzed for all parameters as required by DER 10.

The revised draft PWP laboratory protocol includes all PCB Arochlors as required by DER-10. The revised draft PWP provides the rational for selection of the groundwater and LNAPL samples for the complete suite of parameters that can be analyzed in accordance with DER-10.

The PWP mentions that any wells that need repairs will be repaired. The work plan does not indicate if any wells deemed unsuitable for monitoring or cannot be found will be replaced. Replacement of these wells will be important in completing a comparable assessment of site conditions with respect to the initial RI.

The revised draft PWP proposes a well array that is appropriate to characterize the Site. Existing, repaired and replacement wells have been included in the proposed array. One well is recommended for replacement and 14 IRM Extraction Wells (that will also provide detailed site data) have been recommended. EDPs proposal will result in a greater and more appropriate array of wells than was used for the RI.

The intent of the Department's recommended scope of work was to have task items 1 and

2 completed, with results submitted as part of the PWP. This information was to be used to develop the groundwater assessment scope of work included as task item 3. Therefore, within 20 days of receipt of this letter, EDP should consider the above comments in completing Task 1 and 2 and submit the results of these tasks. Task 3 should be revised to address the comments above and resubmitted with the Task 1 and 2 summaries.
The requirement to do work prior to completion of the PWP was not clear in the October 19 letter or during our meeting following receipt of that letter. Given the December 23, 2016 letter, we now understand the Department is requesting work in advance of the revised draft PWP and EDP completed that work.

If you have any questions regarding the above, please feel free to contact me at 716-856-3333 or by email at jmwilliams@oscinc.com.

Sincerely yours,

Mr. Jon M. Williams
East Delavan Property, LLC
333 Ganson Street
Buffalo, New York 14203

Enclosures
ec: E. Melnyk – NYSDEC
P. Foster – NYSDEC
M. Cruden - NYSDEC
J. Black – ESC

Enclosure A
Preliminary Work Plan and IRM Scope of Work

EAST DELAVAN PROPERTY, LLC

333 Ganson Street • Buffalo, New York 14203 | Phone 716.856.3333 • FAX 716.842.1785

February 17, 2017

Chad Staniszewski, P.E.
Region 9 Remediation Engineer
NYSDEC Region 9 Office
270 Michigan Avenue
Buffalo, NY 14203

Subject: Preliminary Work Plan
Former General Motors and American Axle and Manufacturing Site
East Delevan Avenue, Buffalo, New York
American Axle Site Number 915196

Dear Mr. Staniszewski:

This Preliminary Work Plan (PWP) has been prepared to allow characterization of the historic conditions remaining on the New York State Department of Environmental Conservation (NYSDEC or the Department) Site on the New York State Registry of Inactive Hazardous Waste Sites. The designated State Superfund Site (Site) is a 3.4-acre[1] area listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 915196, with a Classification of 2. The listed Site is located on and represents less than 7 percent of the East Delavan Property, LLC (EDP), property located at 1001 East Delavan Avenue, Buffalo, New York (Figure 1).

The Site was listed as a result of releases associated with the operations by General Motors Corporation (GM) and possibly American Axle & Manufacturing, Inc. (AAM). Neither GM nor AAM are supporting the proposed scope of work or ongoing maintenance at the Site. In 2015, EDP conducted a preliminary search for monitoring wells near the Site during which more than 30 wells were located and purged. Groundwater samples were not collected at that time. In 2017 a systematic search of the Site and surrounding area was conducted and 76 of 79 monitoring wells installed by GM or AAM were identified and evaluated. The three wells that were not located appeared to have been decommissioned by GM as there was no surface opening in the referenced locations.

Program Objectives

The objectives of this focused program are to provide a basis to evaluate the current conditions at the Site and to allow EDP and the Department to assess the current classification and the

[1] Note: The listing indicated 5-acres, but the Site has been measured to be approximately 3.4 acres.

proposed enhancements to the ongoing Interim Remedial Measures (IRM). It is EDPs ultimate goal to achieve conditions that allow the Department to delist the Site. The objective of this Preliminary Work Plan (PWP) is to characterize the Site and address comments in the October 19, 2016 letter[2] and the supplemental comments provided in the January 23, 2017 letter.

In accordance with the October 19, 2016 and January 23, 2017 letters, EDP is providing this PWP for American Axle Site No. 915196 (Site) to the Department to comply with the first phase of the scope of work (italic text provides EDP's basis for the PWP) presented in the attachment to the October letter:

1. "Includes an assessment of the integrity of all existing wells (both on-site and offsite)[3] and identifies any repairs or replacement work that needs to ensure the integrity of the well."

    a. *The listed Site covers an area of approximately 3.4 acres.*
    b. *EDP identified 76 monitoring wells (Table 1) in and around the Site that will provide an understanding of the conditions in the fill, clay and bedrock. In total, EDP attempted to locate 79 monitoring wells; so EDP successfully located more than 96 percent of the wells abandoned by GM (Table W-1):*
        i. *30 wells screened in fill,*
        ii. *31 wells screened in clay, and*
        iii. *18 wells screened in bedrock.*

        There was no surface features at the three unidentified well locations leading EDP's consultant to conclude the wells had been previously closed by GM or AAM.
    c. *Each located monitoring well was developed and the integrity was evaluated.*
    d. *A monitoring well gauging summary of these activities is presented in Table W-2.*
    e. *Following the initial field assessment, the wells recommended for groundwater or LNAPL sampling and a summary of necessary repairs or replacement activities necessary to ensure integrity of each monitoring well were summarized and are presented in Table W-3 and shown on the Figures (Fill, Clay and Bedrock).*

2. "Provides all investigation/monitoring data collected after EDP assumed ownership and control of the Site (following GM's bankruptcy), including but not limited to LNAPL quantities and PCB concentrations of oil removed from the oil recovery system, all data collected in association with trench/pit abandonment and any other

[2] Casper, Peter, October 19, 2016, Letter to Gregory Photiadis, RE: American Axle Site No. 915196.
[3] This document and PWP is for the listed Site. The basis of the activity is to provide data to determine if the "Site" is eligible for reclassification or delisting. As such, the term "all wells" is understood to mean those wells in and around the listed Site.

sediment, groundwater or soil/fill sampling data from the Site and adjoining property."

a. *Collected investigation/monitoring data from existing monitoring wells located on or in the vicinity of the Site after EDP assumed ownership and control (following GM's bankruptcy) is attached (Attachment A).*
b. *Existing data has been primarily collected from the B-26 coolant pit recovery system area (Tables A-1 and A-2). Waste disposal characterization data for the liquids purged during the initial assessment is also provided (Table A-3).*
c. *Specific well sampling was not conducted and well specific analytical data was not collected.*

3. "Provides work plan elements for a current groundwater assessment utilizing all existing monitoring wells (both on and off-site) that evaluates the nature and extent of NAPL in fill, clay and bedrock, including PCB concentration in oil accumulated in all wells, and dissolved phase contaminant concentrations in groundwater."

a. *Following evaluation and any necessary repairs, each monitoring well presented in Table W-1 were gauged (aqueous and non-aqueous phases) and re-developed by surge and purge methodology via disposable polyethylene or non-dedicated PVC bailers. Total well depths were sounded and compared to construction depths to verify the removal of any recoverable sediment build-up since last developed (Table W-2).*
b. *Based on the distribution of wells and the data available, representative wells were selected for sampling of LNAPL and groundwater (see Table W-3). Recommended sampling will include:*
    i. *Gauging the well for both LNAPL and groundwater;*
    ii. *Purging the well of three volumes of liquid or to dryness;*
    iii. *Following recovery and if no measureable product is identified, groundwater from each identified monitoring well will be sampled. Groundwater samples from monitoring wells containing immiscible liquids (i.e., LNAPL) will not be collected.*
    iv. *When sufficient volume is present, representative LNAPL samples will be collected.*
c. *Groundwater and LNAPL samples will be analyzed for the range of Polychlorinated Biphenyls (PCB's) (via Method 8082) detected during the previous GM investigations.*
d. *The analytical data will be summarized by hydrogeologic unit; fill, clay, and bedrock. Summary tables for the wells including the data provided in the 2009 Supplemental RI will be compiled. Where data are available, trend charts will be presented.*

e. *Subsequent to the initial sampling event, a third round of well gauging (depth to water and depth to product) will be performed as a comparison to the initial two events (February 15, and pre-sampling).*
f. *Based on the initial assessment, the nature and extent of LNAPL and PCB-impacts in the fill, clay, and bedrock units will be evaluated.*
g. *The data will be summarized in both tabular and graphic formats (Figures and trend charts).*
h. *The basis for reclassification, as appropriate, will be presented.*

Note, the supplemental IRM is currently operating and LNAPL and water recovery from the B-26 coolant pit will continue throughout the implementation of the PWP. EDP has also identified additional collection and treatment measures that are proposed in the attached IRM Scope of Work (Attachment B). Work activities described in this PWP will be performed in accordance with NYSDEC technical guidance DER-10 (May 3, 2010).

Preliminary Work Plan

The objective of the PWP is to collect sufficient data to characterize the Site and facilitate possible reclassification or delisting of the Site. As such, the work described herein is expected to close data gaps identified in previously collected data by GM, and assess the changes in conditions from those interpreted over eight years ago, and the majority collected more than 10 years ago. This PWP will also provide a quantitative basis to evaluate the current status, and concentration trends of the conditions at the Site.

The focus of the initial data collection event was to determine what monitoring well assets remain and the integrity of those assets in and around the Site. The PWP (1) addresses repair or replacement of wells needed to characterize the Site (Table W-3), (2) will provide a data set to allow evaluation of the occurrence of LNAPL and impacted groundwater at and around the Site (Table W-3), and (3) will provide a comparison of the current conditions to those reported in 2009 (three rounds of well gauging data in 2017 will be used with the 2009 data set to provide trend charts for both PCBs and LNAPL occurrence). The data will facilitate an assessment of the current Site conditions and allow EDP and NYSDEC to determine the proper program for future management of the Site.

Implementation of the PWP will provide the following data from monitoring wells in and around the Site:

- Monitoring well integrity[4];
- Depth to water and calculated groundwater elevations (three rounds of gauging);

[4] The work completed in advance of this PWP provided a basis for the integrity evaluation. The purging and gauging during the PWP will allow a longer term assessment of the communication between the wells and the environment.

- Depth to, and thickness of, LNAPL within each hydrogeologic unit (i.e., fill, clay and bedrock);
- PCB concentrations in groundwater and LNAPL;
- LNAPL occurrence and thickness in proximity and relative to the 5x9 sewer within each hydrogeologic unit (i.e., fill, clay, and bedrock);
- Time versus concentration trend analysis of historical and current data to identify potential trends.

Groundwater and immiscible product sampling will be performed in accordance with standard sampling protocols and analytical testing will be conducted by a NYS ELAP-Certified laboratory. The Department will be notified a minimum of three days prior to sampling to allow attendance during these activities.

Our primary NYSDEC point of contact for field work will be:

Eugene Melnyk, P.E.
NYSDEC Project Manager
(716) 851-7220
eugene.melnyk@dec.ny.gov

Well Evaluation

GM and AAM (signatories to the Administrative Order on Consent or "AOC") stopped maintaining the monitoring well network at the Site sometime between 2008 and 2010. AAM failed to leave any environmental records[5] associated with the Site. In 2017, EDP and Benchmark conducted a systematic and detailed search of the area in and around the Site for the monitoring wells shown on the RI figures. Located monitoring wells were positively identified by:

- Location, relative to the former column designations;
- Any markings on the caps or casings;
- Gauging the total depth of the well; and
- Other information that could be collected.

The Site has been cleared of all former GM/AAM industrial equipment and buildings (except the IRM and the roof over the IRM area).

[5] Although there were significant numbers of records at the site during the period of AAM ownership, all records were purged prior to transfer of the site to EDP. The body of data available to EDP are those records copied during the due diligence process for the property.

Table W-3 summarizes the monitoring wells positively identified and assessed following the initial Site visit(s). The " Recommendations" column includes references to historic data and comments on the usefulness of each well for characterization.

Monitoring well assessment and evaluation included the following:

- Condition (i.e., surface seal, J-plug, riser, road box, cover, obstructions, etc.);
- Gauging of initial depth to product (if present), depth to groundwater, and total depth below top of casing or ground surface[6];
- Re-development (well volume calculation, volume of product (if present) and groundwater removed, apparent LNAPL thickness, field measurements, and drawdown);
- For each of the wells that can be referenced to the RI:
    - Condition,
    - Depth relative to original records,
    - Repairs required, and
    - Replacement recommended (for those that cannot produce representative samples).

Purged liquids have been temporarily containerized at the Site, and will be analyzed for waste characterization parameters. The liquids will be properly stored in a secure location. Based upon the analytical results and upon consultation with the appropriate transportation and disposal companies, EDP will arrange for off-site disposal.

Data Summary

Monitoring well data collected during EDP consultant's review and assessment has been summarized and discussed in the attached Tables. The data will be compiled with data from 2009 and the upcoming gauging and sampling events in a letter report submitted to the Department following receipt of the analytical data.

The historical data obtained by EDP prior to the initial well assessment consists primarily of GM discharge and disposal characterization data from liquids collected in the B-26 Coolant Pit (Attachment A).

[6] While the initial gauging data was collected, it is not representative of Site conditions. Because the wells have not been maintained since GM abandoned the program nearly 10 years ago, LNAPL thickness measured in a monitoring well typically exceeds the LNAPL-saturated formation thickness by a factor estimated to range between approximately 2 and 10 (Mercer and Cohen, 1990). As such, LNAPL thickness reported herein are referred to as an "apparent" thickness. LNAPL thickness in each formation (i.e., fill, clay, or bedrock) will also differ due to the heterogeneity of subsurface geology across the Site.

Schedule

The PWP field schedule has been developed using aggressive timelines (Table S-1). As such, EDP is proposing to follow a dual track, PWP and installation of enhancements to the IRM (please see IRM Work Plan, Attachment B). EDP will maintain communication with the Department and update the schedule as necessary based on the results of the PWP and IRM field activities.

Summary

EDP has been a diligent steward of the Site and surrounding property at 1001 East Delavan Avenue since 2010 when both GM and AAM abruptly stopped addressing the environmental conditions that resulted from their operations. EDP believes the Scope of Work presented in this PWP is appropriate to not only define the current monitoring conditions at the Site but will allow EDP to (1) enhance the IRM and (2) prepare a characterization for the conditions at the Site and (3) to recommend proper Site classification going forward.

We look forward to working with the Department to continue our stewardship of the Site.

Sincerely yours,

John M. Williams

Attachments

Cc: John P. Black, P.E.
Patrick Foster, NYSDEC
Eugene Melnyk, NYSDEC

Tables

Table W-1
Well Location Summary
East Delevan Property
Buffalo, New York

18 Bedrock Monitoring Wells (BLUE indicates well outside SF Area)	Date Located	Well Size (Inch)	Comments
CP-4B	02/01/17	4	missing road box cover (12-inch), damaged ring but well is in good shape
CP-8B	02/02/17	4	No lid (12-inch)
CP-9B	na	na	Unable to locate, possibly decommissioned
CP-11B	02/01/17	4	12" lid covering well
CP-14B	02/02/17	4	6" lid covering well
CP-16B	02/01/17	4	12" lid covering well
CP-18B	02/02/17	2	12" Lid, infilled with concrete or frozen debris
CP-20B	01/31/17	4	12" lid covering well
CP-22B	01/31/17	4	missing road box cover, 4" J-plug is damaged
CP-23B	01/31/17	4	8" flush mount surface completion
CP-24B	01/31/17	4	8" flush mount surface completion
CP-25B	01/31/17	4	8" flush mount surface completion
CP-26B	01/31/17	4	8" flush mount surface completion
CP-27B	01/31/17	4	8" flush mount surface completion
CP-28B	02/01/17	4	There is no lid, just an 8" stick up
MW-401B	01/31/17	4	4" steel casing, 12" steel lid
MW-409B	02/14/17	4	OUTSIDE SF AREA - east
T-1B	02/10/17	4	missing road box cover

Table W-1
Well Location Summary
East Delevan Property
Buffalo, New York

31 Clay Monitoring Wells (BLUE indicates well outside SF Area)	Date Located	Well Size (Inch)	Comments
B-1	02/02/17	2	well flooded by surface water, missing road box cover (12 inch)
B-2	02/01/17	2	10" flush mount surface completion, J-plug is pad locked
CP-4A	02/01/17	2	missing road box cover (12 inch)
CP-7A	02/02/17	2	damaged PVC riser, J-plug pushed in riser, obstruction at 1 fbTOR
CP-8A	02/02/17	2	oil in road box, 12" steel lid
CP-11A	02/01/17	2	No lid (12"), pvc is in good shape, obstruction at 2.14 fbTOR
CP-12A	na	na	Unable to locate, possibly decommissioned
CP-13A	02/02/17	2	12" steel lid
CP-14A	02/02/17	2	12" steel lid
CP-15A	01/31/17	2	oil/water mixture in road box, 12" steel lid
CP-17A	02/01/17	2	filled in with debris, water level at grade, 12" steel lid
CP-19A	02/02/17	2	filled in with debris, need road box cover (12 inch)
CP-24A	01/31/17	2	8" flush mount surface completion
CP-25A	01/31/17	2	8" flush mount surface completion, oil in bailer
CP-26A	01/31/17	2	8" flush mount surface completion
CP-27A	01/31/17	2	8" flush mount surface completion
CP-31A	02/14/17	2	OUTSIDE SF AREA - east
CP-32A	02/14/17	2	OUTSIDE SF AREA - east
CP-34A	01/31/17	2	8" flush mount surface completion, No lid or surface completion
M-1A	01/31/17	2	8" flush mount surface completion
M-2A	01/31/17	2	8" flush mount surface completion
M-3A	01/31/17	2	8" flush mount surface completion
MW-14AR	02/02/17	2	12" steel lid
MW-305R	02/02/17	2	oil in road box, missing road box cover (12 inch)
MW-307	02/09/17	2	
MW-309A	02/02/17	2	missing road box cover (12-inch), well filled with debris
MW-400	01/31/17	2	missing road box cover, 4-inch casing
MW-406	02/01/17	2	4" flush mount surface completion
MW-408R	02/14/17	2	OUTSIDE SF AREA - east, WATER AT GRADE
MW-409R	02/14/17	2	OUTSIDE SF AREA - east
T-1A	02/01/17	2	missing road box cover (6-inch)

Table W-1
Well Location Summary
East Delevan Property
Buffalo, New York

30 Fill Monitoring Wells (BLUE indicates well outside SF Area)	Date Located	Well Size (Inch)	Comments
CP-4	02/01/17	2	12-inch steel lid
CP-7	02/02/17	2	12"steel lid
CP-8	02/02/17	2	12-inch lid
CP-9	na	na	Unable to locate, possibly decommissioned
CP-13	02/02/17	2	12-inch lid
CP-14	02/02/17	2	12" no lid
CP-23	01/31/17	1	6-inch surface completion
CP-24	01/31/17	2	8" flush mount surface completion, oil in bailer
CP-25	01/31/17	2	8" flush mount surface completion, oil in bailer
CP-26	01/31/17	2	8" flush mount surface completion
CP-27	01/31/17	2	8" flush mount surface completion, surface water ponding
CP-28	02/01/17	1	8"casing, filled w/ debris, surface water ponding
CP-29	01/31/17	2	road box cover cracked (8-inch)
CP-30	01/31/17	2	6-inch surface completion
CP-31	02/14/17	2	OUTSIDE SF AREA - east
CP-32	02/14/17	2	OUTSIDE SF AREA - east
CP-33	02/14/17	2	OUTSIDE SF AREA - south
CP-34	02/09/17	2	OUTSIDE SF AREA - south
M-1	01/31/17	2	8" flush mount surface completion
M-2	01/31/17	2	8" flush mount surface completion
M-3	01/31/17	2	12-inch steel lid
MW-101	02/02/17	2	damaged road box cover (6-inch), surface water in road box
MW-301	02/09/17	2	
MW-303	02/01/17	2	4-inch surface completion
MW-306	02/02/17	2	missing road box cover (4-inch)
MW-308	02/01/17	2	missing road box cover (4-inch)
MW-309	02/02/17	2	4-inch surface completion
MW-401	01/31/17	2	missing road box cover (4-inch)
MW-407	02/01/17	2	4" steel lid
T-1	02/01/17	2	missing road box cover (12-inch)

Table W-2
Well Guaging Summary
East Delevan Property
Buffalo, New York

18 Bedrock Monitoring Wells (BLUE indicates well outside SF Area)	Well Size (Inch)	Type	Pre-Development Well Gauging Data (10 years of accumulation) Date	Top of Product (fbTOR)	Top of Water (fbTOR)	Well Depth (fbTOR)	Apparent Product Thickness in Well (feet)	Post-Development Well Gauging Data Date	Top of Product (fbTOR)	Top of Water (fbTOR)	Well Depth (fbTOR)	Thickness of Product in Well (feet)
CP-4B	4	steel	02/10/17	11.65	20.40	22.41	8.75	02/15/17	12.22	12.90	22.41	0.68
CP-8B	4	steel	02/09/17	7.85	7.86	21.75	0.01	02/15/17	NP	5.92	21.75	0.00
CP-9B	na	na	*Unable to locate, possibly decommissioned*					*Unable to locate, possibly decommissioned*				
CP-11B	4	steel	02/10/17	7.79	17.36	19.12	9.57	02/15/17	12.00	15.50	19.12	3.50
CP-14B	4	steel	02/10/17	6.54	6.55	22.90	0.01	02/15/17	5.90	6.00	22.90	0.10
CP-16B	4	steel	02/10/17	11.01	17.86	21.49	6.85	02/15/17	12.60	15.02	21.49	2.42
CP-18B	2	PVC	*obstruction at 3.5 feet, within a steel casing*					*obstruction at 3.5 feet, within a steel casing*				
CP-20B	4	steel	02/10/17	11.75	12.36	24.37	0.61	02/15/17	12.93	13.18	24.37	0.25
CP-22B	4	steel	02/10/17	9.06	9.08	28.94	0.02	02/15/17	11.98	11.99	28.94	0.01
CP-23B	4	steel	02/10/17	NP	12.09	22.62	0.00	02/15/17	NP	12.68	22.62	0.00
CP-24B	4	steel	02/09/17	NP	12.62	22.45	0.00	02/15/17	NP	12.66	22.45	0.00
CP-25B	4	steel	02/09/17	12.45	12.65	25.57	0.20	02/15/17	NP	12.77	25.57	0.00
CP-26B	4	steel	02/10/17	NP	11.86	25.52	0.00	02/15/17	NP	12.16	25.52	0.00
CP-27B	4	steel	02/09/17	NP	8.40	22.27	0.00	02/15/17	NP	6.65	22.27	0.00
CP-28B	4	steel	02/10/17	11.20	11.30	25.45	0.10	02/15/17	16.00	16.20	25.45	0.20
MW-401B	4	steel	02/09/17	12.55	12.70	28.07	0.15	02/15/17	12.05	12.22	28.07	0.17
MW-409B	4	steel	02/14/17	NP	8.98	13.95	0.00	02/15/17	NP	9.00	13.95	0.00
T-1B	4	steel	02/10/17	NP	5.91	38.54	0.00	02/15/17	NP	5.98	38.54	0.00

Table W-2
Well Guaging Summary
East Delevan Property
Buffalo, New York

31 Clay Monitoring Wells (BLUE indicates well outside SF Area)	Well Size (Inch)	Type	Pre-Development Well Gauging Data (10 years of accumulation) Date	Top of Product (fbTOR)	Top of Water (fbTOR)	Well Depth (fbTOR)	Product Thickness (fbTOR)	Post-Development Well Gauging Data Date	Top of Product (fbTOR)	Top of Water (fbTOR)	Well Depth (fbTOR)	Depth of Product (fbTOR)
B-1	2	PVC	02/07/17	4.80	14.80	15.40	10.00	02/15/17	3.36	4.10	15.40	0.74
B-2	2	PVC	02/09/17	6.30	15.55	16.27	9.25	02/15/17	5.20	8.50	16.27	3.30
CP-4A	2	PVC	02/10/17	8.40	12.40	16.40	4.00	02/15/17	13.35	13.40	16.40	0.05
CP-7A	2	PVC	*damaged PVC riser, J-plug pushed in riser, obstruction at 1 fbTOR*					*damaged PVC riser, J-plug pushed in riser, obstruction at 1 fbTOR*				
CP-8A	2	PVC	02/09/17	3.03	4.05	15.38	1.02	02/15/17	3.97	3.98	15.38	0.01
CP-11A	2	PVC	*obstruction at 2.14 fbTOR*					*obstruction at 2.14 fbTOR*				
CP-12A	na	na	*Unable to locate, possibly decommissioned*					*Unable to locate, possibly decommissioned*				
CP-13A	2	PVC	02/10/17	8.79	16.37	17.66	7.58	02/15/17	13.30	14.90	17.66	1.60
CP-14A	2	PVC	02/10/17	5.20	14.50	16.83	9.30	02/15/17	5.92	8.36	16.83	2.44
CP-15A	2	PVC	02/10/17	1.52	1.77	16.68	0.25	02/15/17	3.95	4.00	16.68	0.05
CP-17A	2	PVC	02/14/17	NP	0.00	16.11	0.00	02/15/17	9.75	9.85	16.11	0.10
CP-19A	2	PVC	02/14/17	NP	4.34	10.13	0.00	02/15/17	NP	10.00	10.13	0.00
CP-24A	2	PVC	02/09/17	NP	3.30	16.75	0.00	02/15/17	NP	9.85	16.75	0.00
CP-25A	2	PVC	02/09/17	NP	6.73	16.40	0.00	02/15/17	NP	11.70	16.40	0.00
CP-26A	2	PVC	02/10/17	NP	5.54	15.38	0.00	02/15/17	5.83	6.84	15.38	1.01
CP-27A	2	PVC	02/09/17	NP	4.50	14.77	0.00	02/15/17	NP	3.89	14.77	0.00
CP-31A	2	PVC	02/14/17	8.60	8.61	17.02	0.01	02/15/17	NP	13.10	17.02	0.00
CP-32A	2	PVC	02/14/17	NP	7.67	16.70	0.00	02/15/17	NP	11.59	16.70	0.00
CP-34A	2	PVC	02/09/17	NP	10.35	17.80	0.00	02/15/17	NP	9.44	17.80	0.00
M-1A	2	PVC	02/09/17	8.72	9.06	16.34	0.34	02/15/17	12.53	12.54	16.34	0.01
M-2A	2	PVC	02/09/17	NP	3.75	9.62	0.00	02/15/17	NP	6.30	9.62	0.00
M-3A	2	PVC	02/09/17	NP	14.66	16.38	0.00	02/15/17	NP	5.18	16.38	0.00
MW-14AR	2	PVC	02/10/17	0.20	3.30	16.52	3.10	02/15/17	12.18	12.82	16.52	0.64
MW-305R	2	PVC	02/13/17	0.00	12.14	15.92	12.14	02/15/17	11.55	12.35	15.92	0.80
MW-307	2	PVC	02/09/17	7.70	17.40	17.93	9.70	02/15/17	13.70	14.60	17.93	0.90
MW-309A	2	PVC	02/10/17	NP	0.60	11.18	0.00	02/15/17	9.90	10.00	11.18	0.10
MW-400	2	PVC	02/09/17	5.45	8.57	18.10	3.12	02/15/17	5.30	5.80	18.10	0.50
MW-406	2	PVC	02/10/17	NP	6.00	14.63	0.00	02/15/17	NP	5.75	14.63	0.00
MW-408R	2	PVC	02/14/17	NP	0.00	11.71	0.00	02/15/17	NP	1.90	11.71	0.00
MW-409R	2	PVC	02/14/17	NP	0.00	6.64	0.00	02/15/17	NP	1.70	6.64	0.00
T-1A	2	PVC	02/10/17	4.00	10.75	15.38	6.75	02/15/17	3.30	3.85	15.38	0.55

Table W-2
Well Guaging Summary
East Delevan Property
Buffalo, New York

30 Fill Monitoring Wells (BLUE indicates well outside SF Area)	Well Size (Inch)	Type	Pre-Development Well Gauging Data (10 years of accumulation)					Post-Development Well Gauging Data				
			Date	Top of Product (fbTOR)	Top of Water (fbTOR)	Well Depth (fbTOR)	Product Thickness (fbTOR)	Date	Top of Product (fbTOR)	Top of Water (fbTOR)	Well Depth (fbTOR)	Depth of Product (fbTOR)
CP-4	2	PVC	02/07/17	NP	4.50	8.08	0.00	02/15/17	NP	6.50	8.08	0.00
CP-7	2	PVC	02/09/17	NP	4.25	8.10	0.00	02/15/17	NP	3.98	8.10	0.00
CP-8	2	PVC	02/09/17	4.24	4.25	7.40	0.01	02/15/17	NP	3.85	7.40	0.00
CP-9	na	na	*Unable to locate, possibly decommissioned*					*Unable to locate, possibly decommissioned*				
CP-13	2	PVC	02/10/17	4.90	5.11	8.98	0.21	02/15/17	4.90	5.10	8.98	0.20
CP-14	2	PVC	02/10/17	3.60	3.66	8.89	0.06	02/15/17	NP	3.90	8.89	0.00
CP-23	1	PVC	02/10/17	NP	3.38	14.90	0.00	02/15/17	NP	6.67	14.90	0.00
CP-24	2	PVC	02/09/17	NP	4.48	6.70	0.00	02/15/17	NP	4.76	6.70	0.00
CP-25	2	PVC	02/09/17	NP	3.30	6.40	0.00	02/15/17	NP	4.15	6.40	0.00
CP-26	2	PVC	02/10/17	NP	5.10	7.32	0.00	02/15/17	NP	5.08	7.32	0.00
CP-27	2	PVC	02/09/17	0.93	1.66	7.33	0.73	02/15/17	NP	0.10	7.33	0.00
CP-28	1	PVC	02/10/17	4.90	8.80	15.85	3.90	02/15/17	NP	0.00	15.85	0.00
CP-29	2	PVC	02/10/17	NP	2.67	7.63	0.00	02/15/17	NP	4.13	7.63	0.00
CP-30	2	PVC	02/10/17	NP	4.05	6.65	0.00	02/15/17	NP	4.42	6.65	0.00
CP-31	2	PVC	02/14/17	NP	5.54	9.42	0.00	02/15/17	NP	5.60	9.42	0.00
CP-32	2	PVC	02/14/17	NP	6.10	8.74	0.00	02/15/17	NP	6.30	8.74	0.00
CP-33	2	PVC	02/14/17	NP	7.02	8.14	0.00	02/15/17	NP	7.62	8.14	0.00
CP-34	2	PVC	02/09/17	NP	6.19	8.03	0.00	02/15/17	NP	6.17	8.03	0.00
M-1	2	PVC	02/09/17	3.37	4.46	9.66	1.09	02/15/17	4.07	4.08	9.66	0.01
M-2	2	PVC	02/09/17	8.08	9.49	17.92	1.41	02/15/17	6.29	6.36	17.92	0.07
M-3	2	PVC	02/09/17	4.30	4.37	10.20	0.07	02/15/17	4.35	4.40	10.20	0.05
MW-101	2	PVC	02/10/17	NP	0.00	5.55	0.00	02/15/17	NP	3.14	5.55	0.00
MW-301	2	PVC	02/09/17	NP	4.13	6.73	0.00	02/15/17	NP	4.03	6.73	0.00
MW-303	2	PVC	02/10/17	NP	2.70	6.95	0.00	02/15/17	NP	3.40	6.95	0.00
MW-306	2	PVC	02/10/17	2.85	2.86	7.47	0.01	02/15/17	3.19	3.34	7.47	0.15
MW-308	2	PVC	02/07/17	6.15	6.25	14.00	0.10	02/15/17	5.60	5.69	14.00	0.09
MW-309	2	PVC	02/10/17	2.45	2.73	9.10	0.28	02/15/17	3.10	3.20	9.10	0.10
MW-401	2	PVC	02/09/17	4.75	4.85	6.40	0.10	02/15/17	4.70	4.80	6.40	0.10
MW-407	2	PVC	02/10/17	NP	4.71	6.97	0.00	02/15/17	NP	4.65	6.97	0.00
T-1	2	PVC	02/10/17	NP	3.70	5.70	0.00	02/15/17	NP	3.45	5.70	0.00

Table W-3
Recommendations
East Delevan Property
Buffalo, New York

18 Bedrock Monitoring Wells (BLUE indicates well outside SF Area)	Well Size (Inch)	LNAPL Sample	Groundwater Sample	Recommendation / Comment
CP-4B	4	1		Repair Cover, Sample north of Site
CP-8B	4			Replace lid, No sample required at this time, three bays from 5 x 9 Sewer
CP-9B	na			Unable to locate, possibly decommissioned
CP-11B	4	1		
CP-14B	4			
CP-16B	4	1		Immediately adjacent to 5 x 9 sewer, just notrth of B-26 Coolant Pit
CP-18B	2			Historically low concentration, not needed for characterization
CP-20B	4	1		West of 5 x 9 Sewer, edge of Site.
CP-22B	4		1	Historical data inconsistent, sample groundwater
CP-23B	4		1	Southwestern edge of Site, downgradient bedrock well west of 5x9 sewer
CP-24B	4			
CP-25B	4			
CP-26B	4			
CP-27B	4		1	Southern edge of Site, downgradient bedrock well east of 5x9 sewer
CP-28B	4			
MW-401B	4	1		downgradient well east of 5x9 sewer
MW-409B	4			
T-1B	4		1	upgradient bedrock well

Table W-3
Recommendations
East Delevan Property
Buffalo, New York

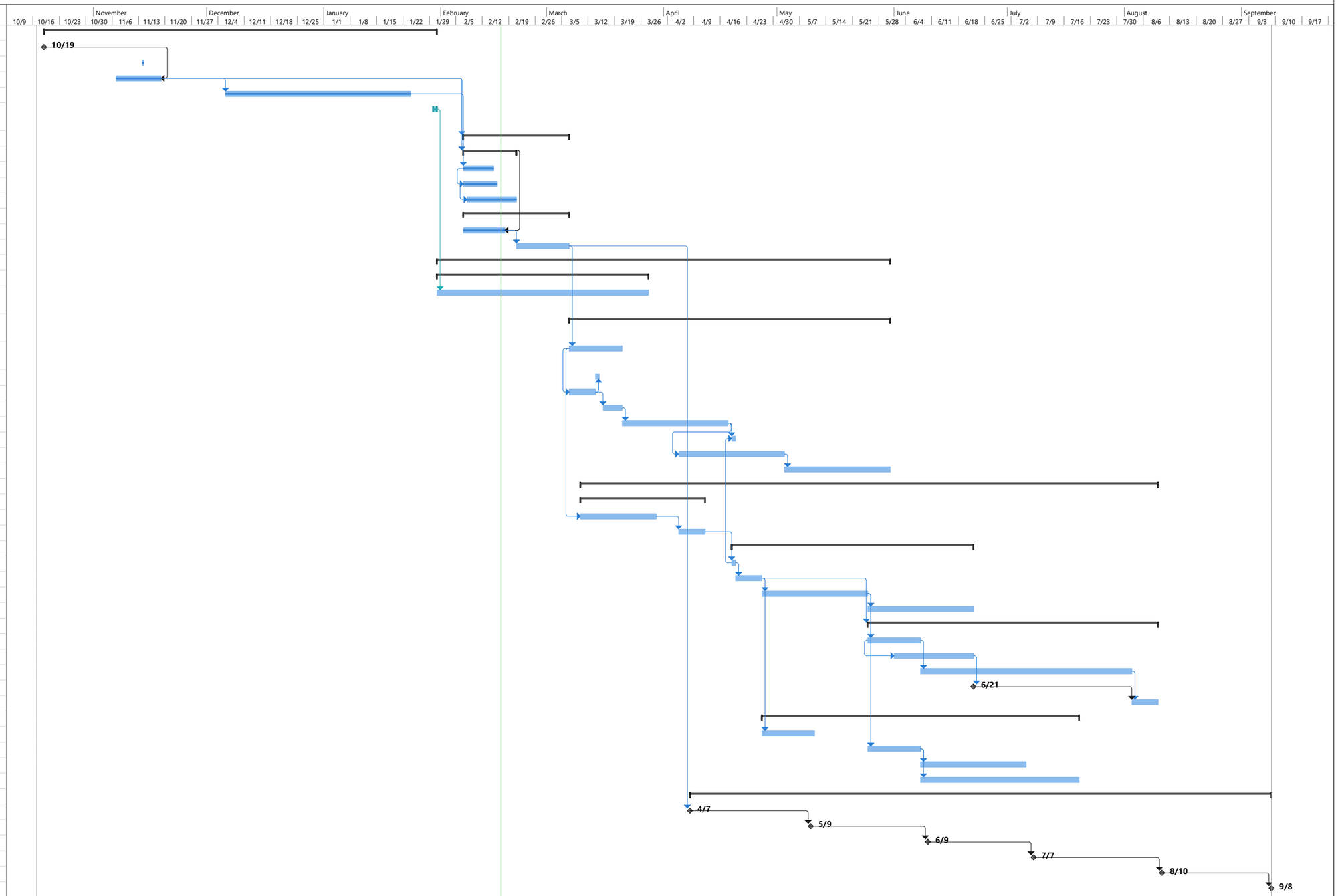
31 Clay Monitoring Wells (BLUE indicates well outside SF Area)	Well Size (Inch)	LNAPL Sample	Groundwater Sample	Recommendation / Comment
B-1	2	1		east of 5x9 sewer, adjacent to B-26 coolant pit
B-2	2			
CP-4A	2	1		North of Site, east of 5x9 sewer
CP-7A	2			
CP-8A	2			
CP-11A	2			Replace, 10 feet west of current location. Use for IRM Monitoring Well
CP-12A	na			Unable to locate, possibly decommissioned
CP-13A	2			
CP-14A	2	1		east of 5x9 sewer
CP-15A	2	1		Western edge of Site, west of 5x9 sewer
CP-17A	2	1		Critical Recovery Area, verify historic data, west of 5x9 sewer
CP-19A	2			
CP-24A	2		1	Western edge of Site
CP-25A	2			
CP-26A	2		1	Adjacent to 5 x 9
CP-27A	2			
CP-31A	2			
CP-32A	2			
CP-34A	2			
M-1A	2			
M-2A	2		1	Southern edge of Site
M-3A	2			
MW-14AR	2			
MW-305R	2	1		Eastern Area of Site, east of 5x9 sewer
MW-307	2			
MW-309A	2			
MW-400	2			
MW-406	2	1	1	LNAPL or Groundwater if no LNAPL, west of 5x9 sewer
MW-408R	2			
MW-409R	2			
T-1A	2	1		west of 5x9 sewer

Table W-3
Recommendations
East Delevan Property
Buffalo, New York

30 Fill Monitoring Wells (BLUE indicates well outside SF Area)	Well Size (Inch)	LNAPL Sample	Groundwater Sample	Recommendation / Comment
CP-4	2			
CP-7	2			
CP-8	2			
CP-9	na			Unable to locate, possibly decommissioned
CP-13	2	1		east of 5x9 sewer
CP-14	2			
CP-23	1		1	Southwest of Site
CP-24	2		1	Southwest area of Site
CP-25	2			
CP-26	2			
CP-27	2			
CP-28	1	1	1	LNAPL or Groundwater if no LNAPL, east of 5x9 sewer
CP-29	2			
CP-30	2		1	West of 5 x 9
CP-31	2			
CP-32	2			
CP-33	2			
CP-34	2			
M-1	2	1		Select; M-1, M-2 or MW-401r, southern edge of Site
M-2	2	1		
M-3	2			
MW-101	2			
MW-301	2			
MW-303	2		1	
MW-306	2	1		If LNAPL is present, eastern area of Site
MW-308	2			
MW-309	2			
MW-401	2			Alternate to M-1 or M-2; select one of the three.
MW-407	2			
T-1	2			

Table S-1 Schedule
PWP, IRN and Supplemental RI Report
East Delavan Avenue
Buffalo, New York

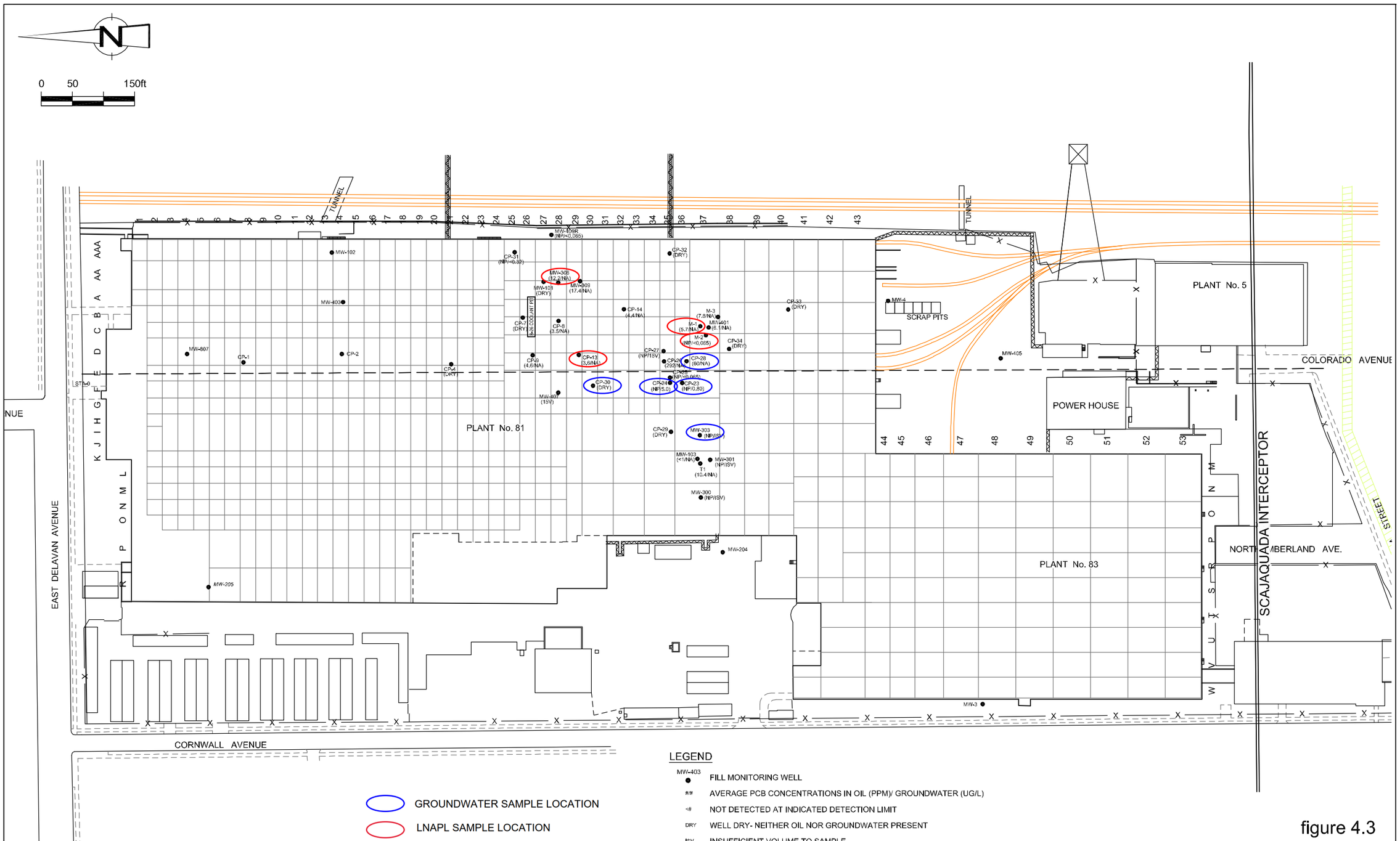
ID	WBS	Task Mode	Task Name
1	**1**		**Program Initiation**
2	1.1		Letter from NYSDEC
3	1.2		Scope Meeting
4	1.3		Preliminary Work Plan
5	1.4		NYSDEC Review
6	1.5		NYSDEC Conference Call - Scope Clarifications
7	**2**		**Preliminary Work Plan**
8	**2.1**		**Well Evaluation**
9	2.1.1		Locate and Assess Wells
10	2.1.2		Evaluate integrity of wells
11	2.1.3		Well Condition Summary
12	**2.2**		**Revised Draft Work Plan**
13	2.2.1		Revise Draft Preliminary Work Plan
14	2.2.2		Review and Approval
15	**3**		**Implement Work Plan**
16	**3.1**		**Data Summary**
17	3.1.1		2010 to 2016 Data Compilation
18	**3.2**		**Groundwater and NAPL Data Collection**
19	3.2.1		Well Repairs and Replacement
20	3.2.2		Gauging
21	3.2.3		Purging
22	3.2.4		Sampling
23	3.2.5		Analytical Laboratory
24	3.2.6		Gauging
25	3.2.7		Data Evaluation and Reporting
26	3.2.8		NYSDEC Review
27	**4**		**IRM Site Work**
28	**4.1**		**Supplemental Wells**
29	4.1.1		Drilling
30	4.1.2		Develop Wells
31	**4.2**		**Sampling and Analysis**
32	4.2.1		Guaging (PWP and IRM Wells)
33	4.2.2		Sampling of IRM Well Array
34	4.2.3		Analytical Laboratory
35	4.2.4		Revise BSA Permit
36	**4.3**		**Piping and Vaults**
37	4.3.1		Cut Concrete
38	4.3.2		Excavate Trenches
39	4.3.3		Place and plumb piping systems
40	4.3.4		Mobilize treatment system
41	4.3.5		Startup System
42	**5**		**Supplemental RI Submission**
43	5.1		Update Trend Charts
44	5.2		Compile IRM and PWP Data
45	5.3		Revised Site Characterization
46	5.4		Draft RI Report
47	**6**		**Reporting**
48	6.1		Month 1
49	6.2		Month 2
50	6.3		Month 3
51	6.4		Month 4
52	6.5		Month 5
53	6.6		Month 6



Project: Table S-1 - 2017 PWP a
Date: Fri 2/17/17

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

Figures



LEGEND

MW-403 ●	FILL MONITORING WELL
##/##	AVERAGE PCB CONCENTRATIONS IN OIL (PPM)/ GROUNDWATER (UG/L)
<#	NOT DETECTED AT INDICATED DETECTION LIMIT
DRY	WELL DRY- NEITHER OIL NOR GROUNDWATER PRESENT
ISV	INSUFFICIENT VOLUME TO SAMPLE
NA	GROUNDWATER NOT SAMPLED DUE TO OIL PRESENCE IN WELL
NP	OIL PHASE NOT PRESENT IN WELL

figure 4.3

PCB PRESENCE IN SITE FILL- 2006 - 2009
AMERICAN AXLE PLANT SITE
Buffalo, New York

12635-03(021)GN-BU056 JUN 11/2009

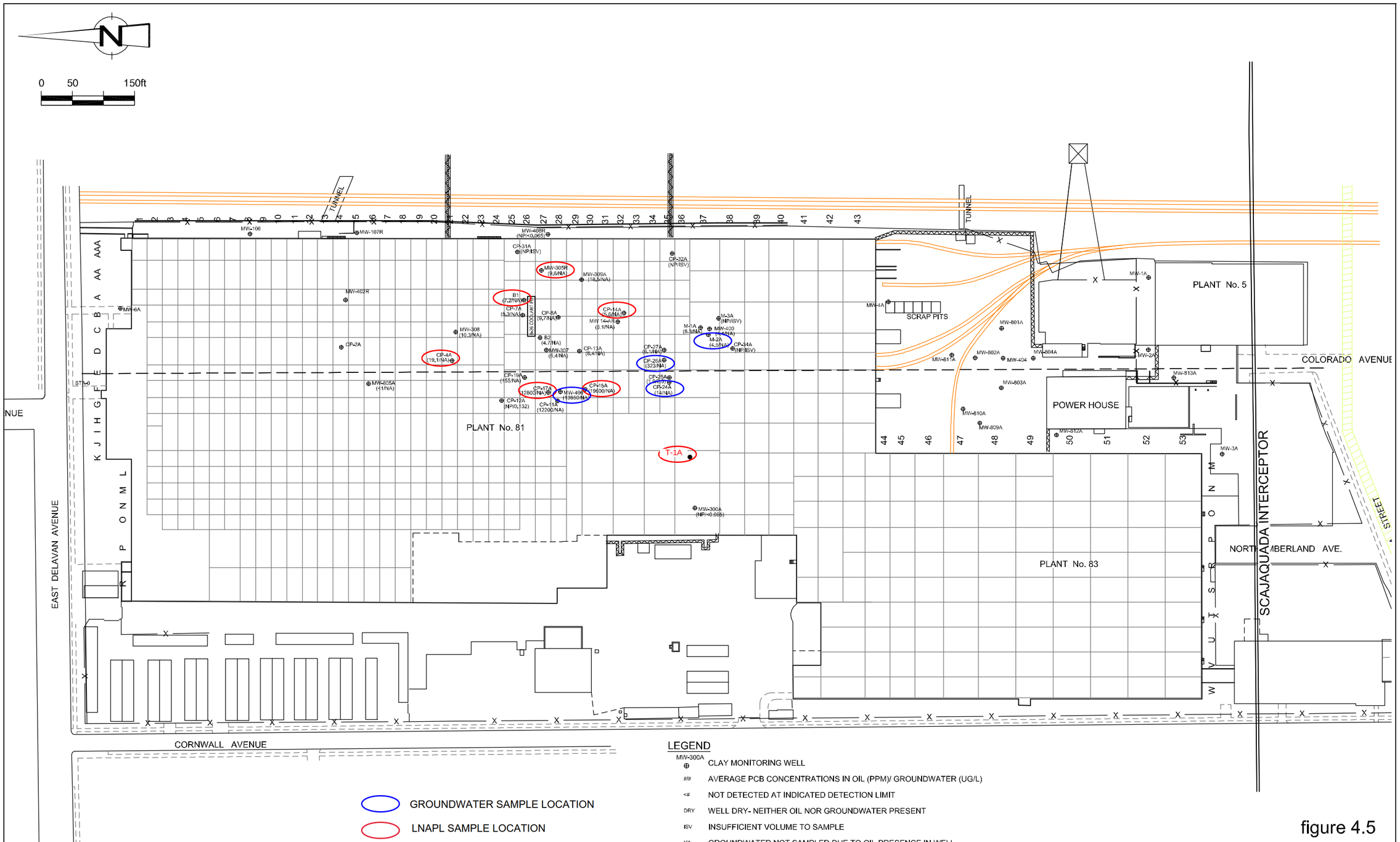
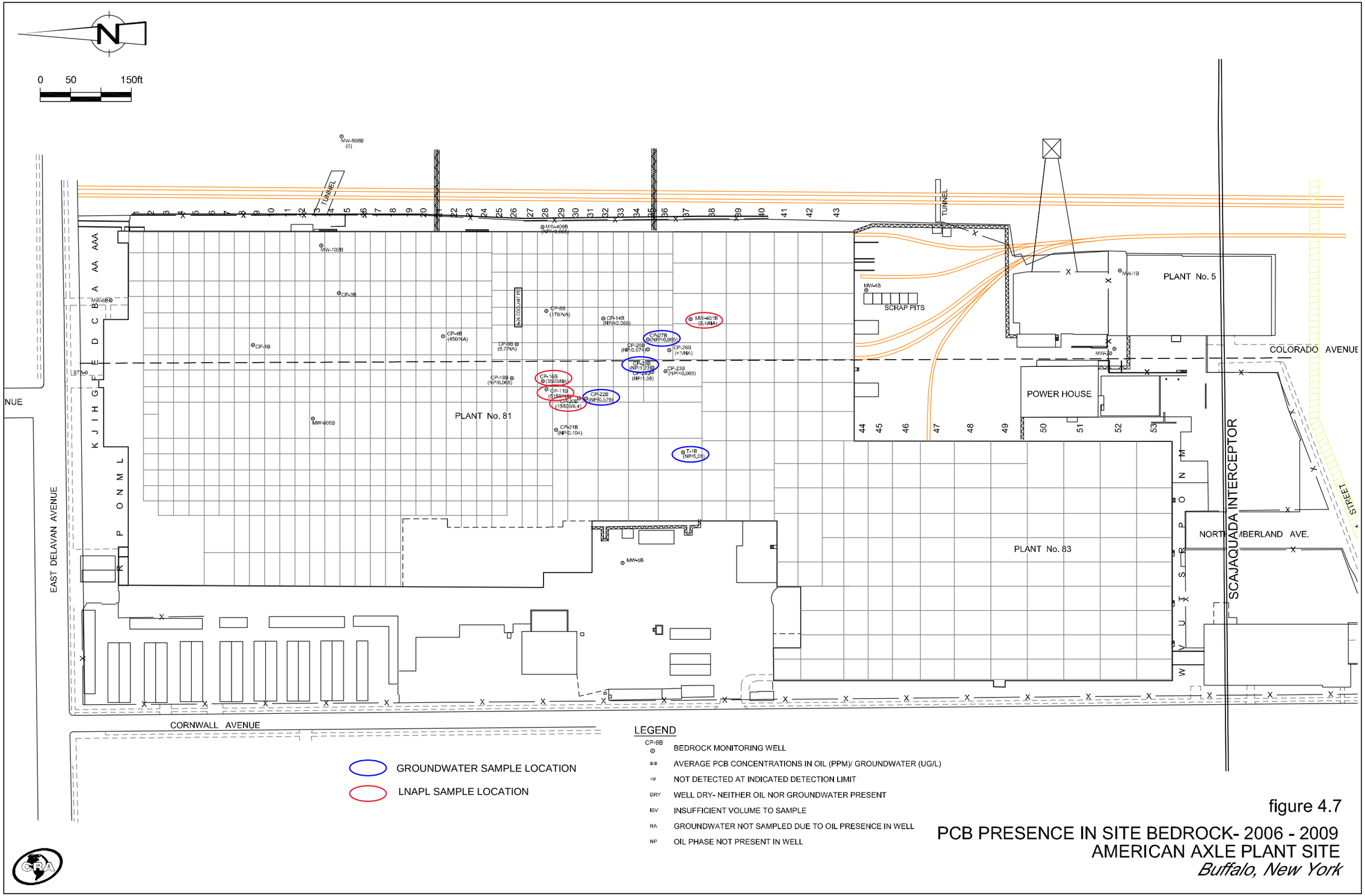


figure 4.5

PCB PRESENCE IN SITE CLAY- 2006 - 2009
AMERICAN AXLE PLANT SITE
Buffalo, New York

12635-03(021)GN-BU058 JUN 11/2009



LEGEND

CP-9B ⊙	BEDROCK MONITORING WELL
#/#	AVERAGE PCB CONCENTRATIONS IN OIL (PPM)/ GROUNDWATER (UG/L)
<#	NOT DETECTED AT INDICATED DETECTION LIMIT
DRY	WELL DRY- NEITHER OIL NOR GROUNDWATER PRESENT
ISV	INSUFFICIENT VOLUME TO SAMPLE
NA	GROUNDWATER NOT SAMPLED DUE TO OIL PRESENCE IN WELL
NP	OIL PHASE NOT PRESENT IN WELL

figure 4.7

PCB PRESENCE IN SITE BEDROCK- 2006 - 2009
AMERICAN AXLE PLANT SITE
Buffalo, New York

12635-03(021)GN-BU060 JUN 11/2009

Attachment A
Data Collected by EDP

Table A-1
Sampling and Analysis
Groundwater Collected in B-26 Sump
Pre-treatment
Jauary 04, 2016

Sample Date			09/10/10	10/27/11	02/07/12	04/24/12	08/01/12	09/28/12	12/04/14
Metals									
	Cadmium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.00250
	Chromium	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	0.011	< 0.010	< 0.0500
	Copper	mg/L	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.032	< 0.0125
	Lead	mg/L	0.015	< 0.010	< 0.010	< 0.010	0.081	0.015	< 0.0500
	Nickel	mg/L	< 0.040	< 0.040	< 0.040	< 0.040	0.103	0.087	< 0.0200
	Silver	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0500
	Zinc	mg/L	0.379	< 0.010	0.088	0.101	0.454	0.94	0.0422
	Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
PCBs									
	PCB-1016	ug/L	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1221	ug/L	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1232	ug/L	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1242	ug/L	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1248	ug/L	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1254	ug/L	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1260	ug/L	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Chlorinated Pesticides									
	4,4-DDD	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	0.201	< 0.100	< 0.100
	4,4-DDE	ug/L	< 0.125	< 0.125	< 0.125	< 0.125	< 0.125	< 0.125	< 0.100
	4,4-DDT	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	0.165	< 0.100	< 0.100
	Aldrin	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	alpha-BHC	ug/L	< 0.100	< 0.100	0.102	< 0.100	< 0.100	< 0.100	< 0.113
	beta-BHC	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.131
	cis-Chlordane	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	delta-BHC	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	0.2	< 0.100	< 0.100
	Dieldrin	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	Endosulfan I	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	Endosulfan II	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	Endosulfan Sulfate	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	Endrin	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	Endrin Aldehyde	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	Endrin Ketone	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	gamma-BHC (Lindane)	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	Heptachlor	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	Heptachlor Epoxide	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	Methoxychlor	ug/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
	Toxaphene	ug/L	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 1.00
	trans-Chlordane	ug/L							< 0.100
	pH	S.U.	7.43	7.66	7.52	7.13	11.69	8.11	6.94

Table A-1
Sampling and Analysis
Groundwater Collected in B-26 Sump
Pre-treatment
Jauary 04, 2016

Sample Date		09/10/10	10/27/11	02/07/12	04/24/12	08/01/12	09/28/12	12/04/14
Semi-Volatile Organics (Acids)								
2,4,6-Trichlorophenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2,4-Dichlorophenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2,4-Dimethylphenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	23.8	< 10.0	< 10.0
2,4-Dinitrophenol	ug/L	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 20.0
2-Chlorophenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2-Nitrophenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
4,6-Dinitro-2-methylphenol	ug/L	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 20.0
4-Chloro-3-methylphenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
4-Nitrophenol	ug/L	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 25.0	< 20.0
Pentachlorophenol	ug/L	< 25.0	< 25.0	< 25.0	< 25.0	47.4	< 25.0	< 20.0
Phenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	107	< 10.0	< 10.0
Semi-Volatile Organics (Base Neutrals)								
1,2,4-Trichlorobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichlorobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,3-Dichlorobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,4-Dichlorobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2,4-Dinitrotoluene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2,6-Dinitrotoluene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2-Chloronaphthalene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
3,3'-Dichlorobenzidine	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
4-Bromophenyl phenyl ether	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
4-Chlorophenyl phenyl ether	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Acenaphthene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Acenaphthylene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Anthracene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	368	< 10.0	< 10.0
Benzidine	ug/L	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
Benzo (a) anthracene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	122	< 10.0	< 10.0
Benzo (a) pyrene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Benzo (b) fluoranthene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Benzo (g,h,i) perylene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Benzo (k) fluoranthene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bis (2-chloroethoxy) methane	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bis (2-chloroethyl) ether	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bis (2-chloroisopropyl) ether	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bis (2-ethylhexyl) phthalate	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Butylbenzylphthalate	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Chrysene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	130	< 10.0	< 10.0
Di-n-butyl phthalate	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Di-n-octylphthalate	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Dibenz (a,h) anthracene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Diethyl phthalate	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Dimethyl phthalate	ug/L	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0
Fluoranthene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Fluorene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Hexachlorobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Hexachlorobutadiene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Hexachlorocyclopentadiene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Hexachloroethane	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Indeno (1,2,3-cd) pyrene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Isophorone	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
N-Nitroso-di-n-propylamine	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
N-Nitrosodimethylamine	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
N-Nitrosodiphenylamine	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Naphthalene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	11.9	< 10.0	< 10.0
Nitrobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Phenanthrene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Pyrene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

Table A-1
Sampling and Analysis
Groundwater Collected in B-26 Sump
Pre-treatment
Jauary 04, 2016

Sample Date		**09/10/10**	**10/27/11**	**02/07/12**	**04/24/12**	**08/01/12**	**09/28/12**	**12/04/14**
Total Petroleum Hydrocarbon)	mg/L	16.3	< 5.0	15	9	17	192	
Volatile Organics								
1,1,1-Trichloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 0 20.0	< 2.00	
1,1,2,2-Tetrachloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 0 20.0	< 2.00	
1,1,2-Trichloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 0 20.0	< 2.00	
1,1-Dichloroethane	ug/L	< 2.00	< 2.00	3.35	< 2.00	< 0 20.0	2.3	
1,1-Dichloroethene	ug/L	4.71	< 2.00	< 2.00	< 2.00	< 0 20.0	< 2.00	
1,2-Dichlorobenzene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 0 20.0	< 2.00	
1,2-Dichloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 0 20.0	< 2.00	
1,2-Dichloropropane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 0 20.0	< 2.00	
1,3-Dichlorobenzene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 0 20.0	< 2.00	
1,4-Dichlorobenzene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 0 20.0	< 2.00	
2-Chloroethyl vinyl Ether	ug/L	< 10.0	< 10.0	< 10.0	< 10.0	< 100	< 10.0	
Benzene	ug/L	< 0.700	< 0.700	< 0.700	< 0.700	< 0.70	< 0.700	
Bromodichloromethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Bromoform	ug/L	< 5.00	< 5.00	< 5.00	< 5.00	< 50.0	< 5.00	
Bromomethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Carbon Tetrachloride	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Chlorobenzene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Chloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Chloroform	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Chloromethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
cis-1,3-Dichloropropene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Dibromochloromethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Ethylbenzene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Methylene chloride	ug/L	< 5.00	< 5.00	< 5.00	< 5.00	< 50	< 5.00	
Tetrachloroethene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Toluene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
trans-1,2-Dichloroethene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
trans-1,3-Dichloropropene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Trichloroethene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Trichlorofluoromethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	
Vinyl chloride	ug/L	20.7	11.4	2.17	< 2.00	< 0 20.0	< 2.00	

Table A-1
Sampling and Analysis
Groundwater Collected in B-26 Sump
Pre-treatment
Jauary 04, 2016

Sample Date			**01/10/14**	**06/09/14**	**12/04/14**	**06/08/15**
Metals						
	Cadmium	mg/L	< 0.00500	< 0.00250	< 0.00250	< 0.00250
	Chromium	mg/L	< 0.0100	< 0.0500	< 0.0500	< 0.0500
	Copper	mg/L	< 0.0250	< 0.0125	< 0.0125	< 0.0125
	Lead	mg/L	< 0.0100	< 0.0500	< 0.0500	< 0.0500
	Nickel	mg/L	< 0.0400	< 0.0200	< 0.0200	< 0.0200
	Silver	mg/L	< 0.0100	< 0.0500	< 0.0500	< 0.0500
	Zinc	mg/L	0.0818	0.156	0.0422	0.0372
	Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
PCBs						
	PCB-1016	ug/L	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1221	ug/L	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1232	ug/L	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1242	ug/L	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1248	ug/L	< 1.00	1.2	< 1.00	< 1.00
	PCB-1254	ug/L	< 1.00	< 1.00	< 1.00	< 1.00
	PCB-1260	ug/L	< 1.00	< 1.00	< 1.00	< 1.00
Chlorinated Pesticides						
	4,4-DDD	ug/L	0.144	< 0.99	< 0.100	< 0.100
	4,4-DDE	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	4,4-DDT	ug/L	< 0.100	0.146	< 0.100	< 0.100
	Aldrin	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	alpha-BHC	ug/L	0.102	0.203	0.113	0.103
	beta-BHC	ug/L	< 0.100	< 0.100	0.131	< 0.103
	cis-Chlordane	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	delta-BHC	ug/L	< 0.100	0.126	< 0.100	< 0.100
	Dieldrin	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	Endosulfan I	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	Endosulfan II	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	Endosulfan Sulfate	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	Endrin	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	Endrin Aldehyde	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	Endrin Ketone	ug/L	< 0.100	0.12	< 0.100	< 0.100
	gamma-BHC (Lindane)	ug/L	< 0.100	< 0.100	< 0.109	< 0.109
	Heptachlor	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	Heptachlor Epoxide	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	Methoxychlor	ug/L	< 0.100	< 0.100	< 0.100	< 0.100
	Toxaphene	ug/L	< 0.100	< 0.100	< 1.00	< 1.00
	trans-Chlordane	ug/L	< 0.100	0.155	< 0.100	< 0.100
	pH	S.U.	7.24	7.04	6.94	6.8

Table A-1
Sampling and Analysis
Groundwater Collected in B-26 Sump
Pre-treatment
Jauary 04, 2016

Sample Date		01/10/14	06/09/14	12/04/14	06/08/15
Semi-Volatile Organics (Acid/Base Neutrals)					
1,2,4-Trichlorobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichlorobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
1,3-Dichlorobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
1,4-Dichlorobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
2,4,6-Trichlorophenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
2,4-Dichlorophenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
2,4-Dimethylphenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
2,4-Dinitrophenol	ug/L	< 20.0	< 20.0	< 20.0	< 20.0
2,4-Dinitrotoluene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
2,6-Dinitrotoluene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
2-Chloronaphthalene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
2-Chlorophenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
2-Nitrophenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
3,3'-Dichlorobenzidine	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
4,6-Dinitro-2-methylphenol	ug/L	< 20.0	< 20.0	< 20.0	< 20.0
4-Bromophenyl phenyl ether	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
4-Chloro-3-methylphenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
4-Chlorophenyl phenyl ether	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
4-Nitrophenol	ug/L	< 20.0	< 20.0	< 20.0	< 20.0
Acenaphthene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Acenaphthylene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Anthracene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Benzidine	ug/L	< 20.0	< 20.0	< 20.0	< 20.0
Benzo (a) anthracene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Benzo (a) pyrene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Benzo (b) fluoranthene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Benzo (g,h,i) perylene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Benzo (k) fluoranthene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Bis (2-chloroethoxy) methane	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Bis (2-chloroethyl) ether	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Bis (2-chloroisopropyl) ether	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Bis (2-ethylhexyl) phthalate	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Butylbenzylphthalate	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Chrysene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Dibenz (a,h) anthracene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Diethyl phthalate	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Dimethyl phthalate	ug/L	< 20.0	< 20.0	< 20.0	< 20.0
Di-n-butyl phthalate	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Di-n-octylphthalate	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Fluoranthene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Fluorene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Hexachlorobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Hexachlorobutadiene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Hexachlorocyclopentadiene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Hexachloroethane	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Indeno (1,2,3-cd) pyrene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Isophorone	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Naphthalene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Nitrobenzene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
N-Nitrosodimethylamine	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
N-Nitroso-di-n-propylamine	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
N-Nitrosodiphenylamine	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Pentachlorophenol	ug/L	< 20.0	< 20.0	< 20.0	< 20.0
Phenanthrene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Phenol	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Pyrene	ug/L	< 10.0	< 10.0	< 10.0	< 10.0

Table A-1
Sampling and Analysis
Groundwater Collected in B-26 Sump
Pre-treatment
Jauary 04, 2016

Sample Date		**01/10/14**	**06/09/14**	**12/04/14**	**06/08/15**
Total Petroleum Hydrocarbon)	mg/L	34	78	< 5	41
Volatile Organics					
1,1,1-Trichloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
1,1,2,2-Tetrachloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
1,1,2-Trichloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
1,1-Dichloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
1,1-Dichloroethene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
1,2-Dichlorobenzene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
1,2-Dichloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
1,2-Dichloropropane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
1,3-Dichlorobenzene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
1,4-Dichlorobenzene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
2-Chloroethyl vinyl Ether	ug/L	< 10.0	< 10.0	< 10.0	< 10.0
Benzene	ug/L	< 0.700	< 0.700	< 0.700	< 0.700
Bromodichloromethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Bromoform	ug/L	< 5.00	< 5.00	< 5.00	< 5.00
Bromomethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Carbon Tetrachloride	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Chlorobenzene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Chloroethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Chloroform	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Chloromethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
cis-1,3-Dichloropropene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Dibromochloromethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Ethylbenzene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Methylene chloride	ug/L	< 5.00	< 5.00	< 5.00	< 5.00
Tetrachloroethene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Toluene	ug/L	14.4	14.4	< 2.00	< 2.00
trans-1,2-Dichloroethene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
trans-1,3-Dichloropropene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Trichloroethene	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Trichlorofluoromethane	ug/L	< 2.00	< 2.00	< 2.00	< 2.00
Vinyl chloride	ug/L	< 2.00	< 2.00	< 2.00	< 2.00

Table A-2
Sampling and Analysis
Oil Collected in B-26 Sump
Disposal Profile Sampling
Jauary 04, 2016

Sample Date		**12/02/09**	**08/02/10**	**10/22/10**	**02/17/11**	**06/30/11**	**02/24/12**	**04/24/12**	**05/09/12**	**09/28/12**	**11/05/12**	**01/16/13**	**03/21/13**	**05/06/13**	**08/20/13**	**05/07/14**	**12/15/14**
Arochlor 1016	mg/Kg	< 1.97	< 0.971	< 0.984	< 0.99	< 0.990	< 0.977	< 0.992	< 0.977	< 0.990	< 0.956	< 0.99	< 0.96	< 0.901	< 0.973	< 0.986	< 0.971
Arochlor 1021	mg/Kg	< 1.97	< 0.971	< 0.984	< 0.99	< 0.990	< 0.977	< 0.992	< 0.977	< 0.990	< 0.956	< 0.99	< 0.96	< 0.901	< 0.973	< 0.986	< 0.971
Arochlor 1022	mg/Kg	< 1.97	< 0.971	< 0.984	< 0.99	< 0.990	< 0.977	< 0.992	< 0.977	< 0.990	< 0.956	< 0.99	< 0.96	< 0.901	< 0.973	< 0.986	< 0.971
Arochlor 1032	mg/Kg	< 1.97	< 0.971	< 0.984	< 0.99	< 0.990	< 0.977	< 0.992	< 0.977	< 0.990	< 0.956	< 0.99	< 0.96	< 0.901	< 0.973	< 0.986	< 0.971
Arochlor 1042	mg/Kg	< 1.97	< 0.971	< 0.984	< 0.99	< 0.990	< 0.977	< 0.992	< 0.977	< 0.990	< 0.956	< 0.99	< 0.96	< 0.901	< 0.973	< 0.986	< 0.971
Arochlor 1048	mg/Kg	9.17	9.21	8.14	9.3	8.29	9.02	12.4	10.9	7.72	4.3	8.4	5.6	4.52	2.29	11.1	3.55
Arochlor 1054	mg/Kg	< 1.97	< 0.971	< 0.984	< 0.99	< 0.990	< 0.977	< 0.992	< 0.977	< 0.990	< 0.956	< 0.99	< 0.96	< 0.901	< 0.973	< 0.986	< 0.971
Arochlor 1060	mg/Kg	< 1.97	< 0.971	< 0.984	< 0.99	< 0.990	< 0.977	< 0.992	< 0.977	< 0.990	< 0.956	< 0.99	< 0.96	< 0.901	< 0.973	< 0.986	< 0.971

Table A-3
Sampling and Analysis
Oil Collected in Preliminary Monitoring Wells
Disposal Profile Sampling
Jauary 04, 2016

		Arochlor 1016	Arochlor 1021	Arochlor 1022	Arochlor 1032	Arochlor 1042	Arochlor 1048	Arochlor 1054	Arochlor 1060
16-Oct-2015	Oil Water Tote[1]	< 09.80	< 09.80	< 09.80	< 09.80	< 09.80	46.7	< 09.80	< 09.80

[1] *This the composite sample of oil from well purging of discovered monitoring wells, not associated with the B-26 Sump collection system*

EAST DELAVAN PROPERTY, LLC

333 Ganson Street • Buffalo, New York 14203 | Phone 716.856.3333 • FAX 716.842.1785

BY Electronic-Mail and Overnight Carrier

December 3, 2015

Mr. Patrick Foster
Senior Attorney
Office of General Counsel
New York State Department of Environmental Conservation
625 Broadway
14th Floor
Albany, New York 12233-1500

Re: Summary of Work to Date
Former General Motors and American Axle and Manufacturing Site
Portion of 1001 East Delavan Avenue, 1001 East Delevan Avenue, Buffalo, NY
Site Number 915196

Dear Mr. Foster:

In your November 18, 2015 e-mail on behalf of the New York State Department of Environmental Conservation (NYSDEC) you requested the following "…by Thursday, December 3":

- "…summary of work completed at the Site, including a Site Plan noting where activities have been undertaken…." and
- "a bulleted list of conditions to be reviewed at a Site visit…"

The American Axle Plant Site (Site) is a 5-acre area listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 915196 (Photograph 1), with a Classification of 2. The Site was listed as a result of releases to the environment by General Motors (GM). EDP purchased the facility with the knowledge and understanding that General Motors (GM) was responsible and under the 2006 Order with the NYSDEC to remediate the conditions caused by more than four decades of automotive parts manufacturing at the site. Approximately one year later, GM filed for protection under bankruptcy laws and stopped all activity at the Site. AAM, the subsequent owner and operator of the manufacturing facility declined to fulfill the responsibilities of the 2006 Order. East Delavan Property (EDP), the current owner of the Site and surrounding property, has never manufactured automotive parts at the Site, operated any of the manufacturing equipment that caused the releases to the environment, was not identified in the Order. EDP is a not a party to or a signatory to the Order.

Work Completed

EDP has been cooperating with the NYSDEC since its purchase of the facility containing the Site in October 2008. Rather than allow the conditions below the Site to deteriorate, EDP voluntarily stepped in and upgraded the groundwater treatment plant and has expended more than $3,000,000 to remediate portions of the Site and eliminate the potential releases to the environment associated with materials left at the Site by GM and AAM (see EDP Actions below).

EDP has attended meetings with the NYSDEC since September 2009; at the Site, at the NYSDEC headquarters in Albany, and in the NYSDEC Buffalo Offices. EDP has voluntarily prepared an RI/FS Work Plan which was submitted to the NYSDEC in May 2012. In November 2013, EDP was told that NYSDEC had secured funds to contribute to the remediation and asked both AAM and EDP to attend a meeting at the Buffalo Office. EDP and AAM attended the meeting to discuss a draft Order. EDP reviewed and offered comments on the Order; AAM refused to contribute or be a party to any activity at the Site.

Voluntary Environmental Response by EDP

EDP acquired the property prior to GM's bankruptcy with the full understanding that GM was responsible for the environmental conditions at the property and that AAM would convey a broom clean property. After both GM and AAM abandoned their responsibilities to NYSDEC, EDP has continued to address the conditions at the Site. EDP continues to address the site environmental issues voluntarily, and in fact, has done much more than the limited work GM was completing under the Order, which was limited to periodically hand-bailing light non-aqueous phase liquids (LNAPL) from the subsurface, while much more significant quantities of oil and wastewater filled pits and pipes throughout the property.

EDP has been following a multi-stage program to ensure the conditions remaining following the GM abandonment of their remedial program and RI/FS process do not deteriorate, and in fact EDP has significantly improved site conditions (Figure 1):

1. Eliminated Active Sources – At the time EDP acquired the property from AAM, there were still numerous subsurface pits, sumps and trenches filled with process water and free oil. Although GM had a consultant bailing free product from wells at the site, EDP elected to spend in excess of $1 Million to eliminate the sources of water and oil rather than allow the liquids to move into the environment. EDP removed all free liquids; decontaminated the walls and bases of the pits, sumps and trenches; backfilled the voids with clean stone; and capped the openings with concrete. This work was completed before the GM bankruptcy, so there had been no legal discharge of their responsibilities at that point in time.
2. Eliminated Discharges to the 5 x 9 Sewer – In addition to eliminating Pits, Sumps and Trenches (Photographs 2 to 6) that potentially contributed to the conditions in soil and groundwater; EDP eliminated a number of drains and laterals that discharged directly to the combined sewer from the site. The elimination of these drains and laterals, reduces the hydraulic loading to the combined sewer, reducing the potential for overflow events; and eliminates migration pathways for Site constituents to the sewer.

3. Operating the B-26 Coolant Pit Recovery System – EDP upgraded and continues to operate the recovery system in the coolant pit left by GM. The recovered oil and water are sampled on a quarterly basis and have shown that the recovered oil has relatively low concentrations of Polychlorinated Biphenyl's (PCBs) and the PCB concentration in the aqueous phase is not detected. The continued operation of the recovery system has removed free oil from the environment.
4. Stabilization of Site Conditions – During previous GM investigations active manufacturing and active sources were prevalent at and around the Site. EDP has eliminated the active sources and all current operations are carefully managed to avoid any contribution to the subsurface. As a result, the Site has been allowed to come into equilibrium during the period while the NYSDEC has negotiated for funding of the GM obligations. This stabilization of conditions provides the opportunity to perform a proper RI/FS to characterize the site conditions as they exist, rather than as they were being actively influenced by ongoing releases.

In Summary:

Condition	Prior to EDP	Current
Pits and Sumps	Filled with up to 10 feet of cooling water, cutting oils, and sludge	Sumps emptied, cleaned and backfilled
Roof Drains	Drains throughout Site discharging to the BSA 5 by 9 sewer, and potential conduits	Disconnected from roof system and sealed, eliminating discharge
Recovery System	The recovery system was operated remotely	EDP upgraded the recovery and treatment system and has operated it continuously since it was abandoned by GM
Active Operations	There were active operations within the boundaries of the listed Site	All EDP tenant operations are outside the boundaries of the Site, eliminating any potential for contribution by EDP
Site Equilibrium	The Site was in a dynamic condition with active sources, intermittent remedial actions, and potential contributions from and along utilities	Since 2009 the Site has been stabilized. The elimination of sources of oil and wastewater, in combination with continuous operation of the recovery system by EDP has allowed the site conditions to reach a state of relative equilibrium.

Site Visit

EDP would like to provide NYSDEC an opportunity to visit the Site to see the current conditions. While it may be impossible to appreciate the dramatic changes from the conditions abandoned by GM and AAM, the Site walk will allow NYSDEC to envision that conditions today and understand the scope of what has been accomplished. EDP would propose the following key observation locations:

- The Site – The Site is a 5-acre area within the 1001 East Delevan Property. It is important to visit the Site and understand its relationship to the property.
- Closed Pits and Downspouts – A general tour of the locations of pits, sewers and downspouts that have been closed, eliminating ongoing releases to the environment and the 5x9 sewer.
- The 5x9 sewer – Although it is not practicable to see the 5x9 sewer itself, EDP will identify the surface along the alignment to gain a perspective on its position relative to the Site.
- The Treatment System – The existing treatment system was upgraded from that left by GM.
- The B-26 Coolant Pit – The location of the B-26 Coolant Pit is an important recovery landmark.
- Monitoring Wells – The monitoring wells (Table 1) that have been located on the property will be toured.

Summary

As requested in your November 18, 2015 e-mail, East Delavan Property has provided a summary of the work completed at the Site and a Site Plan. We are looking forward to your visit next week and are prepared to submit a Scope of Work for a proposed Remedial Investigation by December 17, 2015.

Please provide the date and time you wish to visit the Site.

Sincerely yours,

Jon M. Williams
Manager

Table 1
Monitoring Well Summary
Former GM and AMM Facility
East Delevan Avenue, Buffalo, New York

WELL ID	RISER DIAMETER (in.)	MONITORED ZONE	BORING DTB (ft.)	WELL DTB (ft.)	SCREEN LENGTH (ft.)
CP-8	2	FILL	8.0	7.30	5.0
CP-8 A	2	CLAY	16.0	NA	5.0
CP-8 B	4	BR	22.9	21.65	5.0
CP-13	2	FILL	8.9	8.90	5.0
CP-13 A	2	CLAY	18.1	17.85	5.0
CP-14 A	2	CLAY	16.2	15.94	5.0
CP-14 AR	2	CLAY	16.9	16.45	5.0
CP-14 B	4	BR	24.0	23.22	5.0
CP-14	2	FILL	10.0	NA	5.0
CP-15 A	2	CLAY	17.0	16.62	5.0
CP-20 B	4	BR	24.5	24.23	5.5
CP-22 B	4	BR	29.2	29.00	5.0
CP-23	2	FILL	6.0	5.45	5.0
CP-23B	4	BR	23.5	23.25	5.0
CP-24	2	FILL	7.0	6.70	5.0
CP-24A	2	CLAY	18.0	16.70	5.0
CP-24B	4	BR	25.7	22.30	5.0

WELL ID	RISER DIAMETER (in.)	MONITORED ZONE	BORING DTB (ft.)	WELL DTB (ft.)	SCREEN LENGTH (ft.)
CP-25	2	FILL	7.0	6.41	5.0
CP-25A	2	CLAY	18.0	16.35	5.0
CP-25B	4	BR	26.1	25.35	5.5
CP-26	2	FILL	8.0	7.20	5.0
CP-26A	2	CLAY	16.0	15.35	5.0
CP-26B	4	BR	26	25.95	5.0
CP-27	2	FILL	7.0	7.33	5.0
CP-27A	2	CLAY	16.0	14.75	5.0
CP-27B	4	BR	24.0	22.05	5.0
CP-30	2	FILL	7.0	6.60	4.0
CP-34	2	FILL	8.5	8.05	5.5
CP-34A	2	CLAY	18.1	17.75	7.9
M-1	2	FILL	10.0	9.70	5.0
M-1A	2	CLAY	18.3	16.35	5.0
M-2	2	FILL	10.3	9.58	5.0
M-2A	2	CLAY	18.0	17.55	5.0
M-3	2	FILL	11.0	10.15	5.0
M-3A	2	CLAY	16.7	16.30	5.0

WELL ID	RISER DIAMETER (in.)	MONITORED ZONE	BORING DTB (ft.)	WELL DTB (ft.)	SCREEN LENGTH (ft.)
MW-400	2	CLAY	18.8	17.90	5.0
MW-401	2	FILL	7.0	6.41	5.0
MW-401B	4	BR	29.8	28.00	10.3

Figure

BAILEY AVE.

KIRKPATRICK

WECKER

BARNETT

NORTHLAND

WENDE ST.

SCAJAQUADA ST.

ZENNER ST.

KILHOFFER ST.

LESLIE ST.

OLYMPIC AVE.

TTARP

ELEC TWR

WILLIAM GAITER PARKWAY

DELAVAN LEASING,LLC PROPERTY

DELAVAN LEASING,LLC PROPERTY

WSTE TRTMNT PLNT

MAUCK HILL CORP

EDP PROPERTY

DELAVAN LEASING, LLC PROPERTY

GUARD HOUSE

PITS, SUMPS, PIPES AND TRENCHES REMOVED THROUGHOUT THIS AREA

PLANT 5

FORMER PITS IN SOUTH YARD

SUB 1

GATE

COLORADO AVE.

5'x9' SEWER PIPE

B-26 COOLANT PIT

NYSDEC LISTED SITE (L,AA-19,37)

DELAVAN AVE.

SCAJAQUADA ST.

EDP PROPERTY

NORTHUMBERLAND AVE.

NORFOLK AVE.

NORTHUMBERLAND AVE.

EDP PROPERTY

AREA #2 PARKING- BLACKTOP

CORNWALL AVE.

CORNWALL AVE.

EDP PROPERTY

NORTHLAND AVE.

CAMBRIDGE AVE.

CAMBRIDGE AVE.

WORK COMPLETED BY EDP TO DATE

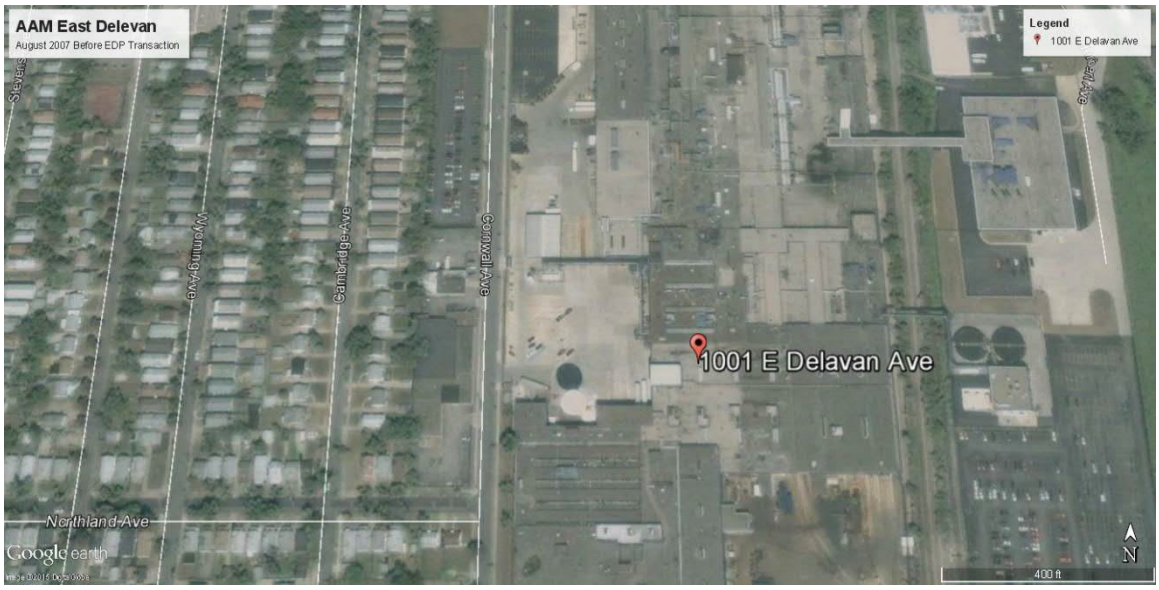
FORMER GENERAL MOTORS AND AMERICAN AXLE PLANT
1001 EAST DELEVAN AVE
BUFFALO, NY 14215.

SIZE	DWG NO.	REV
B	FIGURE 1	1
SCALE:NTS	SHEET: 1 of 1	

Attachments

Attachment A

Photographs



Circa 2007

Photograph 1

Oblique View of Site

(Looking North)

Circa 2014

Photograph 2

View of Interior After Equipment Removed

Circa 2009

Photograph 3

Pit Containing Oily Substance and Wastewater

Circa 2009

(Before GM Bankruptcy)

Photograph 4

Pit During Cleaning

Circa 2009

(Before GM Bankruptcy)

Photograph 5

Pit During Cleaning

Circa 2009

Note: Height of Worker Relative to Height of Staining of Wall; Indicative of Oily Wastewater Elevation and Pressure on Concrete

(Before GM Bankruptcy)

Photograph 6

Pit During Cleaning

Circa 2009

Notes: (1) Height of Staining of Wall; Indicative of Oily Wastewater Elevation and Pressure on Concrete

(2) Pipe Through Wall; Indicative of Possible Transport/Release Pathway

(Before GM Bankruptcy)

Attachment B

Site Description and Relevant Background

Introduction

The Site was listed because of historic conditions remaining on a portion of the property located at 1001 East Delavan Avenue, Buffalo, New York as a result of operations by General Motors Corporation (GM) and American Axle & Manufacturing, Inc. (AAM). The American Axle Plant Site (Site) is a 5-acre area listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 915196, with a Classification of 2.

An Administrative Order on Consent (AOC), Index No. B9-0681-04-12, was executed on August 31, 2006 between New York State Department of Environmental Conservation (NYSDEC), and the former Site owners and operators, GM and AAM, to address environmental concerns at the Site. As a result of the bankruptcy, GM has terminated their contract with their consultants and stopped all work required by their signing the Order. AAM, also a signatory of the Order, have also refused to complete their obligations.

The current Site owner, East Delavan Property, LLC, (EDP) which acquired the property prior to GM's bankruptcy with the full understanding that GM was responsible for the environmental conditions at the property, continues to address the Site environmental issues voluntarily, and in fact, has done much more than the limited work GM and AAM was completing. GM's efforts were primarily limited to having a consultant periodically hand-bail light non-aqueous phase liquids (LNAPL) from the subsurface. EDP has been following a multi-stage program to ensure the conditions remaining following the GM abandonment of their remedial program and RI/FS process do not deteriorate, and in fact EDP has significantly improved site conditions:

1. Eliminated Active Sources – At the time EDP acquired the property from AAM, there were still numerous subsurface pits, sumps and trenches filled with process water and free oil. Although GM had a consultant bailing the free product from wells at the site, EDP elected to spend in excess of $3 Million to eliminate the sources of water and oil rather than allow the liquids to move into the environment. EDP removed all free liquids; decontaminated the walls and bases of the pits, sumps and trenches; backfilled the voids with clean stone; and capped the openings with concrete.
2. Eliminated Discharges to the 5x 9 Sewer – In addition to eliminating Pits, Sumps and Trenches that potentially contributed to the conditions in soil and groundwater; EDP eliminated a number of drains and laterals that discharged directly to the combined sewer from the site. The elimination of these drains and laterals, reduces the hydraulic loading to the combined sewer, reducing the potential for overflow events; and eliminates migration pathways for Site constituents to the sewer.
3. Operated the B-26 Coolant Pit Recovery System – EDP upgraded and continues to operate the recovery system in the coolant pit left by GM. The recovered oil and water are sampled on a quarterly basis and have shown that the recovered oil has relatively low

concentrations of Polychlorinated Biphenyl's (PCBs) and the PCB concentration in the aqueous phase is not detected. The continued operation of the recovery system has removed free oil from the environment.

4. Stabilization of Site Conditions – During previous GM investigations active manufacturing and active sources were prevalent at the site. EDP has eliminated the active sources and all current operations are carefully operated to avoid any contribution to the subsurface. As a result, the site has been allowed to come into equilibrium during the period while the NYSDEC has negotiated for funding of the GM obligations. This stabilization of conditions by EDP provides the opportunity to characterize the site conditions as they exist, rather than as they were being actively influenced by ongoing releases from conditions during operations and as left by GM and AAM.

Site Description and History

The 5-acre Site is located within a larger property at 1001 East Delavan Avenue in the City of Buffalo, Erie County, New York, and is currently owned by East Delavan Property, LLC (EDP). The EDP facility occupies an area of approximately 52 acres and consists of the following general areas:

- NYSDEC classified Site (5 acres): 9 percent (Note: within the area covered with buildings and pavement)
- existing buildings: 50 percent
- paving or other impervious surfaces: 40 percent
- covered with grass or other pervious surfaces: 10 percent

The Site is a 5-acre area within the facility in the area that contained LNAPL in fill, clay soil and potentially bedrock during GM and AAMs period of operation and ownership.

The Site is bisected by an underground combined sewer, owned by the Buffalo Sewer Authority (BSA). The sewer is a combined storm and sanitary utility, which can overflow to the Scajaquada Creek Drain (storm water flow) during periods of high flow. The BSA sewer is approximately 7 feet below the ground surface (bgs) at the facility (sewer crown) and is a brick and mortar tunnel that measures approximately 5 feet high by 9 feet wide, at its highest and widest points. The sewer is historically referred to as the "5x9 sewer". The 5x9 sewer conveys wastewater and stormwater from a huge area of the City of Buffalo (reportedly 55 SPDES permitted discharges enter the 5x9 sewer upstream of the Former GM and AAM Site) and at times flow in the tunnel is in excess of the pipes capacity and discharges onto the ground surface. Due to the age and limits on capacity, no work will be allowed to affect the integrity or aperture of the tunnel.

Scajaquada Creek flows through an aboveground channel from its source approximately 7 miles east of the property, to a location on Pine Ridge Road, where the creek channel discharges into an underground conduit (Scajaquada Creek Drain). The Scajaquada Creek Drain measures approximately 33 feet wide by 14 feet in height, and extends from approximately 1 mile east, to 2 miles west of the property. Immediately to the south of the property, the 5x9 sewer crosses the Scajaquada Creek Drain, where an emergency overflow device is located.

Site Background

GM owned the property including the Site and operated the manufacturing facility from original development in the 1920s until February 1994 when it was sold to AAM. AAM operated the same manufacturing equipment from 1994 until they closed. AAM ceased operations in December 2007 and sold the Property and structures to EDP in October 2008. EDP purchased the property with protections offered by AAM and GM against the environmental conditions that they caused through past site operations. GM and AAM have refused to complete their responsibilities under the AOC with NYSDEC and the contractual provisions with EDP, partly because GM was not held responsible during the bankruptcy proceedings by the state or federal governments. EDP understands that the NYSDEC have negotiated funding for the GM obligations although EDP does not have documentation on how the NYSDEC resolved the previous Order with GM and AAM.

EDP voluntarily completed selective decommissioning, and repurposing and rehabilitation at the facility in an effort to ensure the environmental conditions at the Site were not affected during their ownership and to attract industrial tenants and jobs to the Property. In the process of decommissioning the residuals left by GM and AAM, EDP have removed liquids and sludge's from pits and drains at the site, have removed a number of storm water drains to the 5 x 9 sewer, and have continued to recover LNAPL from the B-26 Coolant Pit. The effect of EDP's efforts have reduced the potential for releases to the environment, reduced the potential for LNAPL flow to the 5x9 sewer, have allowed the site conditions to stabilize, and have reduced the hydraulic loading on the 5x9 sewer (thereby reducing the frequency and magnitude of Combined Sewer Overflow (CSO) events.

Site Investigation History

The environmental conditions of the site had been investigated for more than 10 years prior to GM and AAMs abandonment of their responsibilities under the NYSDEC Order. The majority of the investigations took place while GM and AAM operations were active at the Site.

Pre-RI Investigations

In 1991, during construction activities within the Facility, GM observed LNAPL seeping into a large sump located in Bay B-26. This sump is referred to as the B-26 Coolant Pit. The presence of LNAPL in the B-26 Coolant Pit was reported to NYSDEC in 1991 and Spill Report No. 9104671 was subsequently assigned. LNAPL presence beneath the Facility was identified in soil borings advanced in 1993 and 1994 during due diligence investigations. The presence of LNAPL beneath the Site was addressed in a second Spill Report, No. 9400483, opened in 1994.[1]

In 2000, AAM experienced an excursion of the oil and grease limits of its Buffalo Pollutant Discharge Elimination System (BPDES) discharge permit in the effluent to the combined sewer which traverses the property from Delavan Avenue to Scajaquada Street. In response to the excursion, AAM and GM jointly performed an investigation to determine the source of the oil.[1]

[1] CRA 2006. Remedial Investigation Report, American Axle Plant, NYSDEC Site No. 915196. November

In general, the pre-RI investigations identified four areas of historic operations as potential sources of LNAPL beneath the Site that warranted further investigation and remedial action:

- Former Tank No. 11
- Former Tank No. 5
- Former B-26 Coolant Pit
- Gleason Machine Area

The 5x9 sewer was identified as a potential receptor.[1]

The RI work (discussed below) began in 2001 in response to the subsurface LNAPL discoveries and the BPDES exceedance. As discussed in the Introduction, an AOC for the RI/FS was signed in August 2006 between NYSDEC, GM, and AAM, and the initial RI Report was subsequently submitted to NYSDEC in November 2006.

Remedial Investigation

Beginning in 2001, RI activities were undertaken at the Site. The RI activities focused on the following key areas:

- inspection of and collection of water and wall scraping samples from, the 5x9 sewer beneath the Site
- installation of soil borings for the collection of subsurface soil samples and screening of soils for LNAPL presence
- installation of groundwater monitoring wells and collection of groundwater and LNAPL samples
- hydraulic monitoring and measurement of free-phase liquids on groundwater

The results of this initial RI are presented in detail in the November 2006 RI Report. This report was subsequently disapproved as incomplete by NYSDEC and further investigation was ordered. A Supplemental RI Program was then undertaken as discussed below.

Supplemental Remedial Investigation

In February 2007, the NYSDEC disapproved the 2006 RI Report submitted by GM as incomplete, and provided comments that outlined four "areas" that would require additional investigation:

- polychlorinated biphenyls (PCB)-containing LNAPL identified at select locations would require further investigation and delineation
- impacts to bedrock would require further delineation
- potential impacts to the Scajaquada Creek Drain from the Site would require further investigation
- a more extensive sampling for the target compound list (TCL) suite of parameters to confirm the absence of other contaminants of concern would need to be performed.

Based on NYSDECs comments, a Supplemental RI Work Plan was prepared and submitted for approval. The work plan was implemented in the spring of 2008; however, during the investigation it was determined that further investigation was needed to delineate the nature and

extent of contamination in areas within and at the perimeter of the Site. A meeting was held with the NYSDEC in November 2008 and an addendum to the Supplemental RI Work Plan was submitted to NYSDEC in December 2008. This addendum required:

1. installation of fill and clay borings around the perimeter of the Site to delineate the extent of contamination due to Site sources
2. installation of additional bedrock wells north of the Site in the portion of the Facility known as the Carrier Job Area to delineate the extent of PCBs and LNAPL in the bedrock in this area
3. installation of additional soil borings to the base of the clay unit and installation of monitoring wells to delineate the extent of impacts in the South Yard of the Facility
4. installation of an additional deep bedrock monitoring well at the south end of the Facility to confirm that PCBs are not migrating though the bedrock toward the Scajaquada Creek Drain
5. completion of additional sampling within the Scajaquada Creek Drain further downstream of its confluence with the 5x9 sewer to determine water and sediment quality within the drain
6. completion of additional studies of the 5x9 sewer to determine if tributaries to the sewer might be eliminated due to the change in use of the Site

The investigation activities that were completed in 2008 and 2009 are discussed in detail in the report entitled "Remedial Investigation Report Addendum, American Axle Plant Site, NYSDEC Site No. 915196," dated June 2009 and prepared by CRA.

Supplemental RI Conclusions

The results of the RI and Supplemental RI activities performed at the Site (as presented in the RI Report Addendum) indicate that PCB-containing LNAPL was present beneath the Site in the fill, clay, and shallow bedrock, and that the limits of the LNAPL plume(s) have been defined.[2] The maximum measured PCB concentrations beneath the site were approximately 50 parts per million (ppm) in LNAPL, except for a small area east of the sewer surrounding CP-26 and CP-28, where LNAPL was found with PCB concentrations above 50 ppm. The LNAPL plumes in the clay and bedrock beneath the site also were represented to connect with the LNAPL in these same units beneath a Carrier Job Area.

It should be noted that the RI Report Addendum determined that the LNAPL in the bedrock wells had diminished between 2006 and 2009, and attributes this decrease to the LNAPL recovery program as well as work associated with the B-26 Coolant Pit system.

The results of the investigations performed at the Carrier Job Area suggested that the delineation was complete, as samples from perimeter wells did not contain LNAPL or PCBs. The results indicated that the area was largely absent of groundwater and LNAPL, although some "oily" soils were isolated within the fill. LNAPL and PCBs were identified in samples of the clay soil and in the bedrock units adjacent to and east of the 5x9 sewer. The RI Report Addendum suggested that a secondary source of LNAPL and oily soils may have been present to the north

[2] These measured oil thicknesses continued to decline throughout the IRM OM&M period. These measurements and data will be discussed in detail in the Final RI Report.

of the Carrier Job Area. EDPs elimination of the pits and trenches in this area would have removed the possibility that such a source remains.

The RI Report Addendum concluded that prior to 2008 infiltration of PCB-containing LNAPL occurred sporadically through the 5x9 sewer walls and around laterals beneath the Site. It should be noted that EDP has subsequently removed, sealed, plugged, or otherwise cleaned and closed numerous subsurface sumps and sewer laterals in an effort to reduce the infiltration volume. These will be used to provide a basis for the sewer infiltration remedy in the IRM and FS. In addition, the 2008 Report provided a comparison of samples collected from the same locations between 2006 and 2008, and suggested that the concentration of PCBs in dry weather flow within the 5x9 sewer had decreased since 2006. These data provided evidence that, even before the work completed by EDP, the impacts caused by GM and AAM operations were diminishing.

In terms of the Scajaquada Creek Drain, PCBs were detected in water and sediment samples within the Drain downstream of the 5x9 sewer overflow in 2008 (water sample) and 2009 (sediment sample). The report concluded that these samples were not collected during overflow conditions and therefore were likely not indicative of impacts from the 5x9 sewer. These data suggest, therefore, that there are other sources of PCBs to the Scajaquada Creek Drain upstream of the facility.

Due to the inability to sample the drain during an active overflow in addition to the uncertainties surrounding the sources of sediments with numerous CSOs contributing to the drain, additional samples from the Scajaquada Creek Drain would be inconclusive at best.

In terms of Site delineation, the following conclusions were presented in the RI Report Addendum (samples collected in 2008 and earlier): [3]

- LNAPL is not present in samples from perimeter fill wells located downgradient of the Site.
- LNAPL has been detected in samples from a fill well located upgradient of the Site at the northeast corner of the Facility; however, this presence is due to a localized release.
- LNAPL is not present in samples from perimeter clay wells.
- PCBs in groundwater samples from perimeter clay wells are either non-detect or at concentrations below the standard for Class GA (potable) groundwater.
- LNAPL is not present in samples from perimeter bedrock wells.
- PCBs were present in groundwater samples from the deep bedrock perimeter well (MW-2B) at concentrations above the standard for Class GA (potable) groundwater. This well is located approximately 600 feet to the south (cross-gradient) of the 2009 bedrock plume delineation. This detection is based on data from a single monitoring event and requires further sampling before a conclusion on impacts can be drawn.
- Low concentrations of cis-1,2-dichloroethene and vinyl chloride above the standard for Class GA (potable) groundwater (5 µg/l and 2 µg/l, respectively) were detected in samples from bedrock at the eastern down gradient perimeter well, MW-409B.

[3] CRA 2009. "Remedial Investigation Report Addendum, draft, American Axle Plant Site, NYSDEC Site No. 915196", prepared by CRA. June, bulleted list also.

It should be noted that, when detected, cis-1,2-dichloroethene and vinyl chloride had been consistently below the respective standards at the B-26 Coolant Pit Sump.

EDP Ongoing Data Collection

Following the abandonment of the remedial system by GM, EDP has voluntarily upgraded the recovery system, has continued to operate the IRM, has collected water and recovered oil samples, has contracted for the analysis of the samples and has reported the data to the NYSDEC and the Buffalo Sewer Authority (BSA).

Attachment B
Interim Remedial Measures
2017 Supplemental Scope of Work

1 Introduction

This Interim Remedial Measures (IRM) Work Plan has been prepared on behalf of East Delavan Property, LLC, for the historic conditions remaining on the listed NYSDEC Inactive Hazardous Waste Site (NYSDEC No. 915196) located within the property at 1001 East Delavan Avenue, Buffalo, New York (Site) as a result of operations by General Motors Corporation (GM) and American Axle & Manufacturing, Inc. (AAM). The Site is listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 915196, with a Classification of 2.

An Administrative Order on Consent (AOC), Index No. B9-0681-04-12, was executed on August 31, 2006 between New York State Department of Environmental Conservation (NYSDEC), and the former Site owners and operators, GM and AAM, to address environmental concerns at the Site.

The current Site owner, East Delavan Property, LLC (EDP), which acquired the property prior to GM's bankruptcy, continues to address the site environmental issues voluntarily, and in fact, has done much more than extract light non-aqueous phase liquids (LNAPL) from the subsurface.

The Scope of Work for the IRM has been developed to address three key objectives:

1. Collect LNAPL in the vicinity of the BSA 5x9 Sewer,
2. Collect LNAPL in the vicinity of monitoring wells consistently producing LNAPL at locations east and south of the Site, and
3. Supplement the data collection effort for the preliminary work plan by providing direct measures of LNAPL transmissivity.

The work proposed in this IRM Work Plan for the Site shall be performed in accordance with NYSDEC Technical Guidance for Site Investigation and Remediation, DER-10, dated May 3, 2010.

1.1 Objectives of the Interim Remedial Measure

The key goal of this IRM program are to control movement of LNAPL in the vicinity of the 5x9 sewer. In addition, as the preliminary work plan for the Site is implemented the data collected during the IRM will allow a direct measure of the transmissivity and potential volume of the LNAPL at the Site both in the vicinity of the 5x9 sewer and two other locations east and south of the Site. The IRM is in addition to the measures already taken by East Delavan Property, LLC, to address potential historic sources on the property and ensuring overall protectiveness of the surrounding public and environment. To achieve this goal, the following objectives will be the focus of the program:

1. Develop a monitoring program to gather groundwater and LNAPL data in response to the IRM;
2. Isolate the LNAPL on each side of the 5 x 9 Sewer;
3. Conduct a pumping test in each hydrogeologic unit; fill, clay, and bedrock; to determine if there is recoverable LNAPL;

4. Install recovery wells in each unit with recoverable LNAPL (see attached Figures);
5. Obtain a BSA pre-treatment permit for discharge of treated groundwater from each side of the 5 x 9 Sewer;
6. Install a treatment unit on the west side of the 5x9 Sewer to collect and treat liquids from extraction wells (EWW Extraction Wells)on that side of the sewer;
7. Utilize the existing treatment system for the B-26 Coolant Pit for the liquids recovered by extraction wells east of the 5 x 9 Sewer (EWE Extraction Wells);
8. Collect monthly composite samples of the treated discharge;
9. Submit quarterly reports of the liquid recovery and hydrodynamic response.

1.2 Work Plan Organization

The IRM Work Plan is organized as follows:

- Section 1 – Introduction: provides a brief introduction to the Site and ownership, and identifies the need, purpose, objectives, and organization of the IRM Work Plan and program.
- Section 2 – Site Description and History: highlights the former Site uses and operations, and discusses the sources for contaminants having been released to the environment.
- Section 3 – IRM Operation, Maintenance, and Monitoring: This section discusses the ongoing IRM, the designed and current operating parameters, and the routine operations, maintenance, and monitoring that is performed in support of the IRM.
- Section 4 – Interim Remedial Measures Work Plan: provides a description of the history of IRMs at the Site, identifies the need for additional IRMs, and provides detailed descriptions of the activities to be implemented in order to provide protection of human health and the environment.
- Section 5 – Project Schedule: presents the proposed preliminary Work Plan, IRM and reporting schedules.

2 Site Description and History

The Site is located within a property at 1001 East Delavan Avenue in the City of Buffalo, Erie County, New York (Figure 1), and is currently owned by East Delavan Property, LLC. The East Delavan Property, LLC facility occupies an area of approximately 52 acres and consists of the following general areas:

- covered with existing buildings: 40 percent
- covered with paving or other impervious surfaces: 50 percent
- covered with grass or other pervious surfaces: 10 percent

The Site is a 3.4-acre area within the facility in the area of historical release by the former owners as shown on Figure 2 (Site). As shown, the main buildings[7] historically located on the property are bisected by an underground combined sewer, owned by the Buffalo Sewer Authority (BSA). The sewer is a combined storm and sanitary utility. The BSA sewer is approximately 7 feet below the ground surface (bgs) at the facility (sewer crown) and is a brick and mortar tunnel that measures approximately 5 feet high by 9 feet wide. The sewer is hereinafter referred to as the 5x9 sewer.

2.1 Site Background

GM owned the property including the Site and operated the manufacturing facility from original development in the 1920s until February 1994 when it was sold to American Axle & Manufacturing (AAM). AAM ceased operations in December 2007 and sold the Property and structures to East Delavan Property, LLC (EDP) in October 2008. EDP completed selective decommissioning, repurposing, and rehabilitation at the facility in an effort to attract industrial tenants and jobs to the property. In the process of decommissioning the residuals left by GM and AAM, EDP has removed liquids and sludge from pits and drains at the Site, have removed a number of storm water drains to the 5x9 sewer, and have continued to recover LNAPL from the B-26 Coolant Pit. The effect of EDP's efforts have reduced the potential for releases to the environment, reduced the potential for LNAPL flow to the 5x9 sewer, and have reduced the hydraulic loading on the 5x9 sewer (thereby reducing the frequency and magnitude of Combined Sewer Overflow [CSO] events).

In addition to voluntarily operating the IRM abandoned by GM in 2009, EDP recently identified the wells left by GM and conducted the following activities:

- Identified 76 of 79[8] (96 percent) of the monitoring wells in and around the Site;
- Gauged the depth to liquid, thickness of LNAPL (if any), and the total depth of the well. It is important to note that this data represents the accumulation of liquids over an unknown period, but no less than 8 years, and in some cases more than 10 years;

[7] The property historically was dominated by a single building that evolved over the operating history of General Motors (GM). Since the property was transferred to EDP, EDP has eliminated several portions of the former plant that were not reusable. The site is largely divided into two sections (north and south) with the Site primarily in the open space between the two remaining buildings.
[8] Although the RI Reports indicate there were 79 wells at some time, there is no surficial evidence of the remaining three wells. EDPs consultant has concluded the wells were closed by the previous owner(s).

- Developed all wells. Development included removing three well casing volumes of liquid or bailing the wells until no recoverable liquids were in the casings;
- Gauging the wells following development to provide an indication of the liquids in the environment; and
- Identified a suite of wells to be used to characterize the current Site conditions. The selection process is documented under separate cover in the Preliminary Work Plan (PWP).

The PWP site characterization will proceed in conjunction with this IRM.

3 GM IRM Operation, Maintenance, and Monitoring

Beginning in 2004, GM instituted a pilot program consisting of periodic manual removal of LNAPL from existing groundwater monitoring wells at the Facility. The program consisted of the manual evacuation of LNAPL from a series of groundwater monitoring wells on an unknown schedule, and included LNAPL recovery monitoring.

GM stopped bailing the wells in 2008. EDP was able to observe the program near the time it was abandoned, and had concerns about the methodology and effectiveness of the program. The lack of any noticeable protocol for documentation, decontamination or PPE raises concern about the integrity and representativeness of any subsequent sampling. The time period since that IRM bailing program and redevelopment should allow the wells to be used for future representative sampling.

Included in the GM IRM program was LNAPL recovery from the B-26 Coolant Pit. In 1991, during decommissioning of the equipment and pit, LNAPL was observed seeping into the empty pit at the joints of the sidewalls and bottom. GM determined that the pit was an ideal groundwater/LNAPL collection location, and a float operated sump pump was installed.

Groundwater extracted from the B-26 Coolant Pit sump was treated onsite, using a groundwater pre-treatment system installed as part of the 2006 IRM. LNAPL extracted directly from the B-26 Coolant Pit sump, and LNAPL separated from the aqueous phase, was containerized for offsite disposal by GM. The pre-treatment system consisted of an oil/water separator, an equalization tank, pre-filtration using a bag filter train, a secondary diatomaceous earth filter for emulsified LNAPL removal, carbon treatment using two 55-gallon granular activated carbon (GAC) contactors in series, and a polishing bag filter unit. Based on the design documents, the system was originally designed to treat groundwater at a nominal flow rate of approximately 10 gallons per minute (gpm). This original IRM pre-treatment system was subsequently replaced by EDP with a more robust system.

Upon purchase of the property by EDP in October 2008, operation of the pre-treatment system and the B-26 Coolant Pit sump recovery system were re-established. Shortly thereafter, EDP implemented significant modifications to the groundwater pre-treatment system. The modified system is now located beneath a sheltered area directly above the B-26 Coolant Pit sump. The modified system consists of the following major components:

- Belt oil skimmer (mounted directly on the oil storage drum) for direct removal of LNAPL from the sump
- Submersible groundwater sump pump for aqueous-phase and mixed-phase removal
- Two 10,000-gallon flat-bottom steel oil water separators in series
- 500-gallon coalescing oil water separator
- Two primary bag filters in series
- Two 2,000-pound aqueous-phase granular activated carbon units in series
- Two secondary polishing bag filters in series

The current IRM pre-treatment system discharges to the BSA sewer under permit.

3.1 IRM Operation, Maintenance, and Monitoring

EDP has voluntarily managed the existing IRM and the operation, maintenance, and monitoring (OM&M) since October 2008. The primary tasks involved in the IRM OM&M are as follows:

1. Operation of the existing groundwater pre-treatment system including:
    a. inspection and maintenance of the oil/water separator
    b. monitoring pressures throughout the system to identify maintenance needs
    c. bag filter maintenance and element changes based on pressure monitoring
    d. carbon column monitoring and maintenance including sampling between primary and secondary columns
    e. polishing filter maintenance and element changes based on pressure monitoring
    f. LNAPL containment for offsite disposal
    g. other waste management activities
2. Collection and analysis of BSA Permit compliance samples from the groundwater pre-treatment system effluent (PCBs, VOCs, SVOCs, Oil & Grease, pH, and RCRA Metals) in accordance with the discharge permit
3. Preparation of Quarterly Reports for submittal to BSA (BSA Permit No. 13-01-BU128 EPA Category 40 CFR 403), including:
    a. volume of treated water; and
    b. treated water quality data.

4 Interim Remedial Measures Work Plan

The current IRM addresses the LNAPL that flows into the B-26 Coolant Pit. As a result of the recent well gauging and redevelopment activities, EDP believes that supplemental IRM actions are appropriate while the preliminary work plan is completed.

4.1 IRM Scope

A supplemental IRM for the site, to eliminate or mitigate potential LNAPL or groundwater migration from the Site toward the 5x9 sewer is proposed. The IRM will consist of a series of 14 extraction wells in the overburden/fill/clay and bedrock that will allow collection of mobile LNAPL and groundwater. The wells will be located on each side of the 5x9 Sewer to address the dramatically different conditions that exist on each side of the sewer. These wells will be configured to also testing of multiple recovery and treatment approaches including:

- Application of a vacuum above the LNAPL surface to increase migration toward the recovery system; and
- Potential introduction of bio-stimulants to break down constituents at the leading edge of the plume.

The conceptual supplemental system has been developed based on the information during the well redevelopment program (Preliminary Work Plan) and the RI Addendum (CRA, 2009), see attached Figures for the extraction well layout.

The IRM will employ a series of 4" diameter groundwater extraction wells (suitable for use as multi-phase extraction wells) equipped with air-operated pneumatic pumps to drawdown the groundwater table in the immediate vicinity of the 5x9 sewer and at selected locations across the Site. Extracted groundwater and LNAPL from the east side of the 5 x 9 Sewer will be pumped to the existing groundwater discharge header pipe that runs between the B-26 Coolant Pit and the phase separation and groundwater pre-treatment system. Backflow preventers will be installed on all of the branches to the header (including the B-26 Coolant Pit Sump) to ensure that discharge flows are appropriately controlled. Extracted groundwater and LNAPL from the west side of the 5 x 9 Sewer will be pumped to a dedicated header pipe to a new phase separation and groundwater pre-treatment system. Backflow preventers will be installed on all of the branches to the header to ensure that discharge flows are appropriately controlled and cannot flow to a recovery well.

Each of the extraction wells will be enclosed in a heavy traffic-rated vault to allow unrestricted use of the slab throughout the Site, or will be protected with high visibility barriers. In addition to the compressed air and groundwater discharge systems, each vault will be pre-piped to allow introduction of bio-stimulants or vacuum application if deemed necessary to enhance LNAPL recovery. This additional step will be performed to allow pilot testing and operation if LNAPL production can be enhanced using vacuum or bio-stimulants.

The total liquid stream will be pumped to the groundwater pre-treatment systems for LNAPL separation and water management. The two streams are being isolated because the RI data indicate that the PCB concentrations on the east side of the 5x9 Sewer are dramatically lower than those on the west. The IRM activities that are proposed consist of the following:

- Design and installation of a series of extraction wells located along the edges of the LNAPL plume in the vicinity of the east and west sides of the 5x9 Sewer (see attached Figures). The extraction wells are intended to induce movement of the mobile LNAPL in the vicinity of the wells. The extraction well locations have been selected to allow collection of groundwater and LNAPL across the Site in the vicinity of monitoring wells with significant recurrences f LNAPL. Based on the 2008 data in the 2009 Supplemental Report, the extent of the LNAPL IRM system has been conceptualized, but the spacing has been adjusted based on the 2017 redevelopment and gauging data.
- Based on the LNAPL sampling data extraction wells will extend to:
  - "Base" of Clay in the vicinity of monitoring wells MW-305R, CP-14A, M1-A/MW-499, B-2, CP-13A, CP-25A and CP-26A
  - Bedrock in the vicinity of monitoring wells CP-4B, Cp-16B, and CP-11B.
- Install the piping systems in carrier pipes embedded in the concrete floor to avoid interfering with the proposed redevelopment of the property.
- Clean and adapt the existing treatment system to ensure the capacity is adequate for the additional flows, and complete the piping runs to collect the eastern recovery well flows and the discharge of the liquids from the B-26 Coolant Pit Sump.
- Mobilize a second treatment system with the capacity to collect the western recovery well flows.
- Update the BSA pretreatment permit to allow discharge of the treated groundwater to the BSA.
- Design and implementation of a performance monitoring program to:
  - Ensure effectiveness of the IRM (radius of influence, recovery and mass removal);
  - Collect a round of baseline water and LNAPL samples at start-up (in conjunction with the Preliminary Work Plan); and
  - Collect data on an ongoing basis to support the site characterization.

The components discussed in this section are illustrated in the drawings contained in Attachment B-1.

4.2 IRM Construction Activities

There are three principle components to the IRM Construction:

- Installation of new overburden and bedrock wells suitable for extraction and/or injection
- Floor removal and trenching for installation of:
  - liquid conveyance,
  - compressed air, and
  - vacuum tubing.

- Installation of double contained groundwater discharge tubing between the extraction wells and the two treatment systems
- Cleaning and adapting the existing groundwater and LNAPL treatment system ("the B-26 System") for use with B-26 and the eastern extraction wells; and
- Mobilization and startup of a new groundwater and LNAPL treatment system for liquids collected west of the 5x9 Sewer.

4.2.1 Extraction and Injection Wells

The series of 14 extraction and injection wells will be installed at the locations shown on the drawings. The well locations were selected using the following criteria:

- Estimate of the presence of mobile LNAPL based on:
  - The 2017 well gauging and redevelopment data;
  - The 2009 supplemental report;
- The position of the 5 x 7 Sewer;
- The existing machine and column footings; and
- Estimated radius of influence of 20 feet.

All wells will be installed using hollow-stem auger (HAS) and rock coring drilling equipment. Soil and rock sampling will be performed to identify the subsurface stratigraphy to ensure proper placement of the well screens. Wells will be constructed using 4-inch diameter, polyvinyl chloride (PVC) well casing and screen in the overburden and open core holes in bedrock.

To ensure safety during drilling, all proposed locations will be marked in the field and evaluated for utility interferences or obstructions by a private utility locator using ground penetrating radar or other necessary means. Soil borings for monitoring well installation will be performed using HSA techniques, with continuous split-barrel sampling, to identify the subsurface stratigraphy and ensure proper placement of the well screens. Well boring and installation will be performed by a NYSDEC-registered groundwater well driller (in accordance with NYS Water Well Driller Registration, ECL § 15-1525) under the full time supervision of a qualified environmental consultant. For boring locations through surficial concrete, each location will be cored with a concrete coring machine or saw cut in advance, to provide a clean penetration through the concrete.

Wells to be installed in bedrock will be isolated from the overburden. A 6-inch diameter casing will be grouted into the bedrock surface to provide separation between the liquids in the overburden and those in the bedrock. Rock will be cored and carefully logged. The fracture pattern and staining in the rock core will be carefully evaluated to allow selection of the correct position of the pump.

All borings will be advanced from the ground surface down to the depths logged by the qualified environmental consultant based on field observations. The soils will be logged in the field for color, texture, and moisture content in accordance with the USCS and screened for organic vapors using a photo-ionization detector (PID). Soil logging will be performed to ensure that

groundwater contact and contact with the glacial till layer are identified. If the glacial till layer is absent, borings will be completed to bedrock as discussed below. Rock coring will be logged for color, texture, rock type, rock quality designation, fracture pattern, and staining.

4.2.1.1 Fill and Clay Zone Extraction Wells

All new fill and clay zone extraction wells, designated "EWE-01A" or EWW-107A" ("EWE" designation for extraction well east, "EWW" for extraction well west and 'A' designation consistent with clay zone wells), will be screened from 2 feet above the static groundwater table down to the glacial till or bedrock interface. If bedrock contact is made during the fill and clay zone extraction well installations, a proper seal will be created and the well screen will be set at a lower limit of 0.5 feet above the top of bedrock. Fill and clay borings shall otherwise end at the top of glacial till. Wells will be constructed using 4-inch diameter PVC well casing, 4-inch PVC well screen (0.010-inch slot size), and a filter pack using #2 silica sand, unless based on split barrel sampling, the qualified environmental professional determines other slot and sand combinations will be better suited for groundwater and LNAPL extraction. Well construction, sand pack, well seal, and well flush-mount finish will be completely documented on well construction logs.

4.2.1.2 Bedrock Zone Extraction Wells

IRM bedrock extraction wells will be completed as open core holes. Borings for bedrock wells will be advanced to the top of the bedrock using a hollow stem auger. Split barrel sampling of the overburden will not be performed during bedrock well installation. At the bedrock contact, a 6-inch diameter steel casing will be grouted in place directly on top of the bedrock surface. Although many site bedrock wells were installed by setting the steel overburden casing 2 feet into bedrock, one of the historically LNAPL producing well, CP-4B, was installed using this alternate method. The casing installation will be logged by the qualified environmental consultant to ensure it is effective in sealing off the overburden and eliminating transport between the units.

Although the bedrock wells are anticipated to be installed to 5 feet below the top of rock, the bedrock will be cored in 5-foot runs. Upon completion of each 5 feet of coring, the water-producing characteristics of the open hole will be evaluated by conducting "bail-down" and recovery tests. Coring will be terminated when the first interval producing adequate water recharge is encountered (this is expected to be the top 5 feet of rock). Bedrock cores will be logged to provide a record of the depth of the core hole and the elevation to which the groundwater rose after drilling.

4.2.1.3 Development and Decontamination

Upon completion of new well installations, all new wells will be developed. Well development will be accomplished, in general, by repeated surging and pumping until the well yields water of acceptable turbidity at the beginning of a pumping cycle. Well development will be performed in accordance with the ASTM D5521-05, Standard Guide for Development of Groundwater Monitoring Wells in Granular Aquifers. All development and purge water will be collected and managed in accordance with the BSA pre-treatment permit. Well development will be

performed no sooner than 48 hours after well installation is completed in the overburden and no sooner than 7 days after well installation is complete for bedrock wells.

Decontamination rinse water, development water, and soil cuttings generated during the well installation and development activities will be contained in U.S. Department of Transportation (DOT)-approved 55-gallon steel drums or totes. The drums and totes will be properly labeled and staged onsite to allow LNAPL and groundwater to separate. Following separation, the LNAPL will be placed in totes for profile sampling and proper offsite disposal. Groundwater will be treated in the existing system and discharged in accordance with the BSA pretreatment permit.

4.2.1.4 Wellhead Vaults

Each of the wellheads will be completed with a traffic-rated (heavy construction equipment rated, if necessary), flush-mounted, pre-cast concrete wellhead vault. The vaults will be manufactured with cast-in-place or cored penetrations to facilitate underground pipe and conduit installation. All penetrations through the vault floor and walls will be sealed using cement grout.

4.2.2 Pneumatic Pumping System

The IRM groundwater extraction will be accomplished using automatic, air-powered pumps. The choice to use air-powered pumps was based on several considerations. Unlike electric pumps, air-powered pumps do not rely on high-speed motors, bearings or impellers, and do not generate any heat. These pumps do not need to be fully submerged to protect the motor from overheating. In addition, liquid shearing is typical of electric pumps, creating oil-water emulsions that would prove difficult to separate in the groundwater pre-treatment system. The air-driven pumps cause far less liquid shearing than electric submersibles, so pre-treatment system will operate more efficiently and effectively.

The pump type that is recommended for most of the IRM extraction wells is AutoPump Model Short AP2T, manufactured by QED Environmental. The AutoPump Short AP2T is approximately 3 feet in length and has an actuation height of 31 inches from the bottom of the pump (bottom of the well if the pump is placed on bottom). This pump will provide adequate drawdown below the invert of the 5x9 sewer in all wells except EWE-## through EWE-##. These wells, based on the estimated bedrock contact, will be too short to accommodate the length of the AP2T, while still providing for adequate drawdown. In these wells, a low-drawdown pump, LD AP4T, is recommended. This low-drawdown pump will provide for an additional 7 inches of drawdown over the AP2T pump, and will maximize the effectiveness of the extraction system.

All of the AutoPumps are suitable for lighter-density liquids (up to 0.7 specific gravity), and compared to the estimated density of the LNAPL beneath the site (SG = 0.8903),[9] the pumps should operate as designed.

A dedicated compressor will be installed as part of the IRM. The location of the compressor will be selected in the field and electrical power will be provided as required. The AutoPumps all use approximately 0.5 standard cubic feet per minute (scfm) for every gallon per minute (gpm) of

[9] CompCo 2009. Paradigm Environmental Services, Inc., Analytical Report, CompCo, For Lab Project # 09-4773, Issued December 18, 2009.

water capacity. Based on a maximum sustained flow rate of 10 gpm (estimated maximum yield), a compressor capable of 5 scfm (at 90 pounds per square inch [psi]) will be provided to power the pumps. These compressors are readily available in the immediate area (e.g.; Ingersoll-Rand 3.0 Hp air compressor, Model SS3L3).

Compressed air will be provided to each wellhead vault using underground piping, buried in the common trench used for the groundwater discharge system. The underground compressed air piping network will be constructed using 1-inch diameter, high-impact strength, acrylonitrile butadiene (ABS) pipe (DuraPlus, manufactured by IPEX USA, LLC). The ABS pipe will be run above ground between the compressor and the marshaling area, and will be continuous into each vault. Inside each vault, a shut-off valve will be installed, and the compressed air tubing provided by the pump manufacturer will be used.

Discharge air tubing will be run from the well pump, back up to the wellhead vault where it will be allowed to vent into the vault. Since this air is non-contact with the water/LNAPL in the pumping system, accumulation of vapors is not expected to result.

4.2.3 Groundwater Discharge System

Extracted groundwater will be conveyed in a double-walled pipe system between the well head vaults and the holding tank ahead of each treatment system. The outer pipe will be installed to facilitate any future expansion or other minor changes that may be needed for the IRM system. If expansion is necessary, the outer pipe will allow additional groundwater tubes to be installed without excavating the trench in the future. The outer pipe will be constructed using a series of 4- and 6-inch PVC pipes that will be installed between each vault and up to the treatment systems. Generally, the number of carrier water tubes that need to be placed inside the outer pipe will dictate the size of the outer pipes. The outer pipe will be run flat with the inverts matched, so that leaks will be transmitted back to the wells. The primary (carrier) water tubes will be run between the wellhead vault, and the marshaling area at the treatment systems.

At the B-26 Coolant Pit area, the carrier water tubes will be marshaled into the existing B-26 Coolant Pit discharge header. A flow meter, backflow preventer, shutoff valve, and sample port will be installed on each groundwater tube prior to combining into the header.

4.2.4 Vacuum Pipes

A set of vacuum pipes will be run between each of the vaults and the marshaling area. The vacuum tubes (and other spare pipes shown on the drawings) will be run in the same common trench with the groundwater discharge piping. The purpose for the vacuum pipes is to provide flexibility of exerting vacuum on one or more of the extraction wells to enhance LNAPL recovery. Vacuum pipe network will be constructed of 2-inch diameter PVC piping.

4.3 IRM Operation, Maintenance, and Monitoring

A stand-alone amendment to the existing OM&M Plan (B-26 Coolant Pit Recovery System) will be prepared to discuss the details of the additional extraction components once the final system design has been approved by NYSDEC. In accordance with the current plan, routine OM&M

activities will continue to be implemented including changing out spent bag filters, monitoring hoses and piping for leaks, monitoring pressure drop across the bag filters and the GAC beds, monitoring the flow rate, and collecting environmental samples as necessary, until this IRM work is complete.

The OM&M Plan amendment will also describe any changes to the current procedures or frequencies such as carbon change-out (frequency), disposal of spent materials, documentation requirements, Health and Safety Plan (HASP) requirements, and emergency contacts.

5 Schedule

The exact schedule following this submission will vary based on NYSDEC review content and duration. An estimated schedule with assumed review and comment durations is presented in Table S-1.

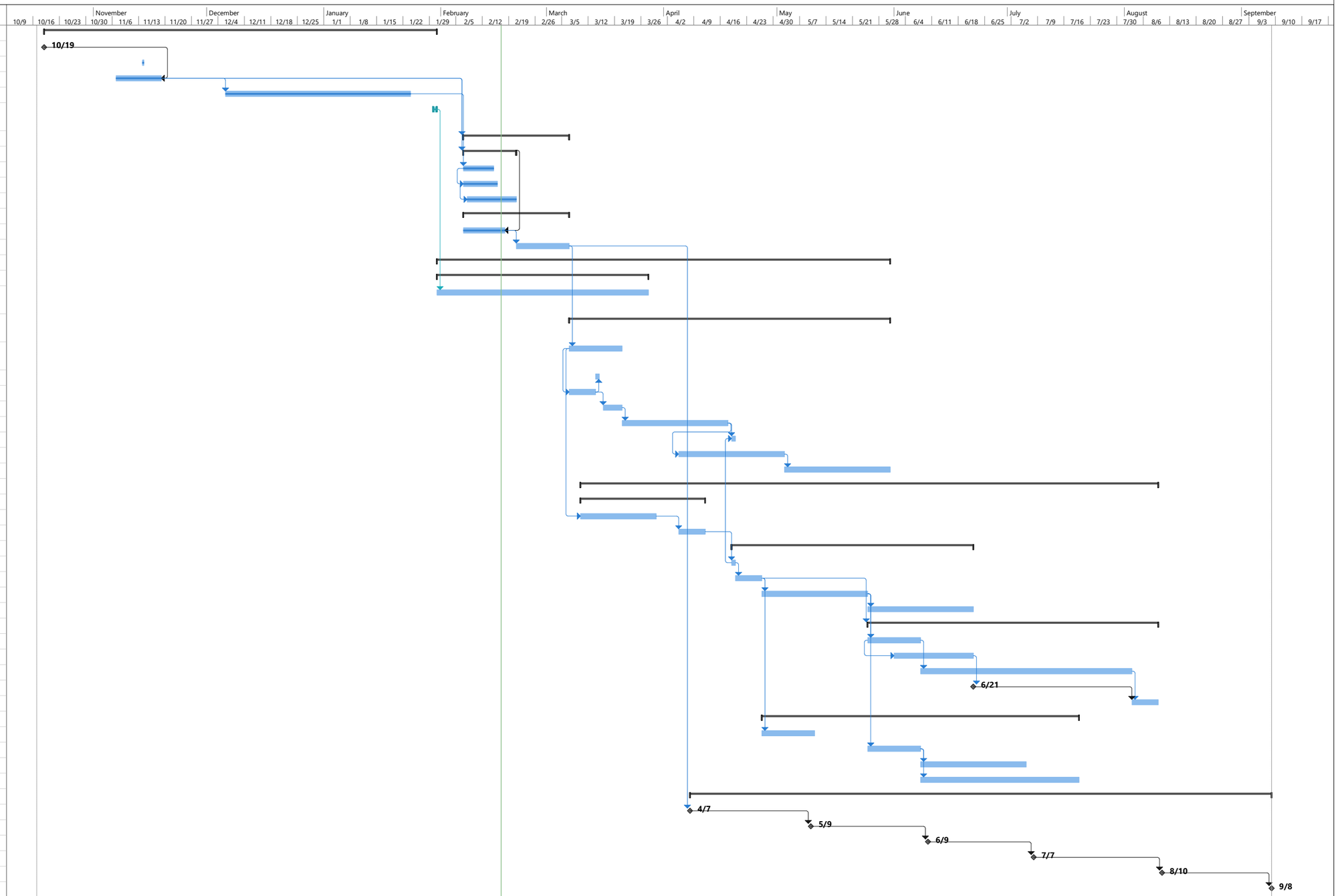
Commencing with the approval of the Preliminary Work Plan, written Monthly Progress Reports, commencing with the start of field work, and describing site/project-related activities completed during the prior reporting period and discuss what is scheduled for the upcoming period, will be prepared and submitted. The Monthly Progress Reports will be submitted to the NYSDEC electronically by the 10th day of each month.

All data generated as a result of the implementation of this Work Plan will be provided to the NYSDEC in an electronic format compatible with the NYSDEC Environmental Information Management System (EIMS).

Upon completion of the field work, a Final IRM As-built Report will be produced and submitted to the NYSDEC. The As-built Report will be prepared in accordance with Section 3.13 of NYSDEC DER-10 / Technical Guidance for Site Investigation and Remediation, and no further Monthly Progress Reports will be prepared.

Table S-1 Schedule
PWP, IRN and Supplemental RI Report
East Delavan Avenue
Buffalo, New York

ID	WBS	Task Mode	Task Name
1	**1**		**Program Initiation**
2	1.1		Letter from NYSDEC
3	1.2		Scope Meeting
4	1.3		Preliminary Work Plan
5	1.4		NYSDEC Review
6	1.5		NYSDEC Conference Call - Scope Clarifications
7	**2**		**Preliminary Work Plan**
8	**2.1**		**Well Evaluation**
9	2.1.1		Locate and Assess Wells
10	2.1.2		Evaluate integrity of wells
11	2.1.3		Well Condition Summary
12	**2.2**		**Revised Draft Work Plan**
13	2.2.1		Revise Draft Preliminary Work Plan
14	2.2.2		Review and Approval
15	**3**		**Implement Work Plan**
16	**3.1**		**Data Summary**
17	3.1.1		2010 to 2016 Data Compilation
18	**3.2**		**Groundwater and NAPL Data Collection**
19	3.2.1		Well Repairs and Replacement
20	3.2.2		Gauging
21	3.2.3		Purging
22	3.2.4		Sampling
23	3.2.5		Analytical Laboratory
24	3.2.6		Gauging
25	3.2.7		Data Evaluation and Reporting
26	3.2.8		NYSDEC Review
27	**4**		**IRM Site Work**
28	**4.1**		**Supplemental Wells**
29	4.1.1		Drilling
30	4.1.2		Develop Wells
31	**4.2**		**Sampling and Analysis**
32	4.2.1		Guaging (PWP and IRM Wells)
33	4.2.2		Sampling of IRM Well Array
34	4.2.3		Analytical Laboratory
35	4.2.4		Revise BSA Permit
36	**4.3**		**Piping and Vaults**
37	4.3.1		Cut Concrete
38	4.3.2		Excavate Trenches
39	4.3.3		Place and plumb piping systems
40	4.3.4		Mobilize treatment system
41	4.3.5		Startup System
42	**5**		**Supplemental RI Submission**
43	5.1		Update Trend Charts
44	5.2		Compile IRM and PWP Data
45	5.3		Revised Site Characterization
46	5.4		Draft RI Report
47	**6**		**Reporting**
48	6.1		Month 1
49	6.2		Month 2
50	6.3		Month 3
51	6.4		Month 4
52	6.5		Month 5
53	6.6		Month 6



Project: Table S-1 - 2017 PWP a
Date: Fri 2/17/17

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

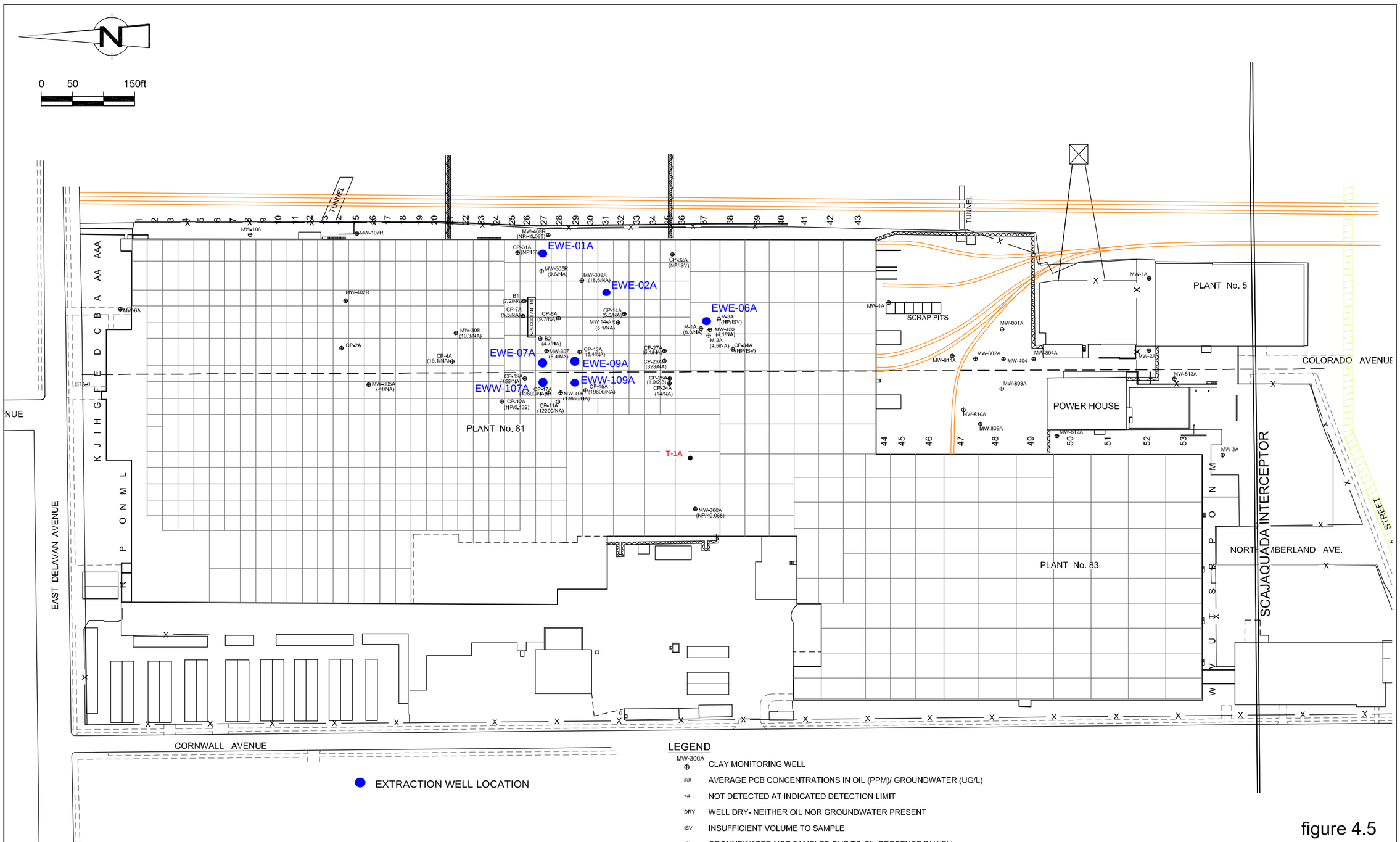


figure 4.5

PCB PRESENCE IN SITE CLAY- 2006 - 2009
AMERICAN AXLE PLANT SITE
Buffalo, New York

12635-03(021)GN-BU058 JUN 11/2009

0 50 150ft

MW-808B (0)
MW-409B (NP/<0.065)
MW-102B
CP-3B
MW-2B
CP-1B
CP-4B (450/NA)
CP-8B (170/NA)
CP-14B (NP/<0.065)
CP-27B (NP/<0.065)
CP-28B (NP/0.074)
CP-28S (<1/NA)
CP-25B (NP/1.23)
CP-24B (NP/1.58)
CP-23B (NP/<0.065)
CP-18B (NP/0.068)
CP-16B (350/NA)
CP-11B (5150/NA)
CP-20B (15500/6.4)
CP-22B (NP/0.579)
CP-21B (NP/0.104)
MW-806B
T-1B (NP/5.28)
MW-9B
MW-4B
MW-401B (2.1/NA)
MW-1B
MW-3B
EWE-104B
EWE-105B
EWE-106B
EWW-107B to EWW-110B
TUNNEL
E-26 COOLANT PIT
SCRAP PITS
PLANT No. 5
POWER HOUSE
PLANT No. 81
PLANT No. 83
COLORADO AVENUE
NORTHUMBERLAND AVE.
SCAJAQUADA INTERCEPTOR
SCAJAQUADA STREET
EAST DELAVAN AVENUE
CORNWALL AVENUE
STEP

GROUNDWATER SAMPLE LOCATION

LNAPL SAMPLE LOCATION

LEGEND

CP-9B ⊙	BEDROCK MONITORING WELL
#/#	AVERAGE PCB CONCENTRATIONS IN OIL (PPM)/ GROUNDWATER (UG/L)
<#	NOT DETECTED AT INDICATED DETECTION LIMIT
DRY	WELL DRY- NEITHER OIL NOR GROUNDWATER PRESENT
ISV	INSUFFICIENT VOLUME TO SAMPLE
NA	GROUNDWATER NOT SAMPLED DUE TO OIL PRESENCE IN WELL
NP	OIL PHASE NOT PRESENT IN WELL

figure 4.7

PCB PRESENCE IN SITE BEDROCK- 2006 - 2009
AMERICAN AXLE PLANT SITE
Buffalo, New York

12635-03(021)GN-BU060 JUN 11/2009