SEMI-ANNUAL STATUS REPORT NO. 17

Olin Chemical Superfund Site
51 Eames St., Wilmington, MA

Submitted to:

United States Environmental Protection Agency
Office of Site Remediation and Restoration
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912

Submitted by:

Olin Corporation
3855 North Ocoee St., Suite 200
Cleveland, Tennessee 37312

Prepared by:

Amec Foster Wheeler
Environment & Infrastructure, Inc.

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Chelmsford, Massachusetts 01824

January 7, 2016

Project No. 6107150016.04

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Peter H. Thompson
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GLOSSARY OF ACRONYMS

AMEC	AMEC Environment & Infrastructure, Inc.
BEHP	Bis(2-ethylhexyl)phthalate
CSL	Calcium Sulfate Landfill
DAPL	Dense Aqueous Phase Liquid
DMF	Dimethylformamide
EE/CA	Engineering Evaluation/Cost Analysis
EPH	Extractable Petroleum Hydrocarbons
IRS	Interim Response Steps
IRSWP	Interim Response Steps Work Plan
ISCO	In-situ Chemical Oxidation
LNAPL	Light Non-aqueous Phase Liquid
MACTEC	MACTEC Engineering and Consulting, Inc.
MassDEP	Massachusetts Department of Environmental Protection
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSA	Method of Standard Additions
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
NDMA	N-nitrosodimethylamine
NDPhA	N-nitrosodiphenylamine
NDPrA	N-nitroso di-n-propylamine
Olin	Olin Corporation
off-PWD	off-Property West Ditch
OU	Operable Unit
QA/QC	Quality Assurance/Quality Control
RAE	Remedial Alternatives Evaluation
RGP	Remediation General Permit
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RPD	Relative Percent Difference
SASR	Semi-Annual Status Report
Site	Olin Chemical Superfund Site
SVOC	Semi-Volatile Organic Compound
TAL	TestAmerica Laboratories, Inc.
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
VPH	Volatile Petroleum Hydrocarbon

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1.0 INTRODUCTION

This Semi-Annual Status Report (SASR) has been prepared for the Olin Chemical Superfund Site (the Site) in Wilmington, Massachusetts, on behalf of Olin Corporation (Olin) by Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler, formerly AMEC). The SASR has been prepared consistent with Section 2.II.C. of the Statement of Work, Remedial Investigation/Feasibility Study (RI/FS), Olin Chemical Superfund Site, prepared by the United States Environmental Protection Agency (USEPA) Region I – New England and dated June 2007 (USEPA, 2007). This SASR summarizes the monitoring activities conducted from April 2015 through September 2015 and presents monitoring data and analytical results including, but not limited to, groundwater and surface water data from the Slurry Wall/Cap and Plant B monitoring programs for the second and third quarter of 2015.

The Site location is presented in **Figure 1-1**. **Figure 1-2** is a Site plan that identifies the three areas that are described in the Interim Response Steps Work Plan (IRSWP) including Slurry Wall/Cap Containment Area, Plant B, and the off-Property West Ditch (OPWD) area. This SASR discusses field and design/construction activities for those three areas which are ongoing Interim Response Steps (IRS) as described in the IRSWP.

The three specific IRSs include:

- Slurry Wall/Cap – monitoring of groundwater, surface water, and sediment in the area surrounding the Slurry Wall and inspection of the temporary cap;
- Plant B – operation, maintenance, and monitoring of the groundwater recovery/treatment system that was designed to remove and control migration of light non-aqueous phase liquid (LNAPL); and
- Dense Aqueous Phase Liquid (DAPL) Extraction Pilot Test – design, installation and operation of a pilot study to evaluate the efficacy of DAPL extraction in the OPWD Area.

This SASR is organized as follows:

Section 1.0 – Introduction
Section 2.0 – Slurry Wall/Cap
Section 3.0 – Plant B
Section 4.0 – DAPL Extraction Pilot Test Design
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May 2015 Calcium Sulfate Landfill Sampling
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B-4 Unvalidated Data
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Appendix C – Weir Monthly Inspection Reports: April 2015 – September 2015

Appendix D – Slurry Wall/Cap Groundwater and Surface Water Time Series Plots

D-1 Groundwater (Aluminum, Ammonia, Chloride, Chromium, Sulfate)
D-2 Surface Water (Aluminum, Ammonia, Chloride, Chromium, Sulfate)

Appendix E – Slurry Wall/Cap Data Logger Water Level Plots

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2.0 SLURRY WALL/CAP

The following sections present results of chemical analyses for groundwater and surface water samples associated with the slurry wall/cap during the second and third quarter of 2015. Groundwater level data for the second and third quarter of 2015 are presented in the field activity reports contained in **Appendices A-1 and A-2**. The data validation memoranda for these sampling events are provided in **Appendices B-1 and B-2**, respectively. The results of these analyses are generally consistent with past results.

Olin personnel conducted weekly observations of the weir and South Ditch and recorded observations concerning wildlife, surface water conditions, and flocculent accumulation. These reports are reviewed by Amec Foster Wheeler and compiled in separate monthly reports, which are provided for the current reporting period in **Appendix C**.

2.1 Groundwater

Slurry Wall/Cap groundwater sampling and analysis for the second quarter of 2015 sampling event was completed from May 18th through June 3rd, 2015. The third quarter of 2015 sampling event was completed on August 18th and 19th, 2015.

The second quarter of 2015 sampling event included groundwater sample collection from 14 monitoring wells: GW-24, GW-25, GW-34SR, GW-34D, GW-35S, MP-2#13, GW-43SR, GW-76S, GW-78S, GW-79S, GW-201S, GW-202S, GW-202D, and GW-CA-1 (GW-10S was dry and not able to be sampled); and five piezometers: PZ-16RR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25 located along the South Ditch consistent with the Final IRSWP. The third quarter of 2015 sampling event included groundwater sample collection from five monitoring wells: GW-25, GW-78S, GW-79S, GW-202S, and GW-202D; and five piezometers: PZ-16RR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25.

Quality Assurance/Quality Control (QA/QC) samples include two field duplicates and two matrix spike/matrix spike duplicates (MS/MSD).

The sample locations, details of sampling, and the analytical program are identified in the field activity reports. Field activity reports for the second and third quarter of 2015 sampling events are contained in **Appendices A-1 and A-2**, respectively. The field activity reports also contain tabulated final field parameter measurements collected at the time of sampling, sample collection field data records, and instrument calibration records. Groundwater samples are analyzed by TestAmerica Laboratories, Inc. (TAL) for ammonia, chloride, sulfate, specific conductance and filtered samples are analyzed for aluminum and chromium.

Table 2-1 and Table 2-2 summarize groundwater analytical results for samples collected during the second and third quarter of 2015 sampling events. The data validation memoranda for groundwater and surface water are included in **Appendices B-1 and B-2** and conclude that TAL results are useable as reported by the laboratory unless otherwise indicated in the validation report.

Appendix D-1 presents time series groundwater concentration plots for aluminum, ammonia, chloride, chromium, specific conductance, and sulfate from the south, southeast, west, and north areas surrounding the Containment Area. These plots include historic data along with data from the second and third quarter of 2015 sampling events. Groundwater analytical data for monitoring well GW-43SR (west of the Containment Area) and piezometers PZ-24 and PZ-25 (south of the Containment Area) have been added to **Appendix D**. Two wells (PZ-24 and GW-35S) identified

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on these plots are interior to the Containment Area, while one well (GW-CA1) is located within the gravel equalization window.

The analytical results for dissolved metals (aluminum and chromium) in groundwater samples collected from south of the Containment Area (GW-78S, GW-202S, GW-202D, PZ-17RRR, PZ-18R, PZ-24, PZ-25), southeast of the Containment Area (GW-79S, GW-201S, PZ-16RR), west of the Containment Area (GW-24, GW-25, GW-26, GW-42S (MP-2#13), GW-43SR, GW-76S), and north of the Containment Area (GW-34D, GW-34SR, GW-35S, GW-CA1) are consistent with historical data and are within historical ranges (**Appendix D-1, Figures D-1.1 through D-1.8**) with a few exceptions where increases in concentrations are noted.

Concentrations of dissolved aluminum and chromium in GW-202D continue to steadily decline from the maximum concentrations detected in 2008 and 2009. The concentration of dissolved aluminum in GW-10S continues to exhibit a gradual, though small, increase and two of the last four results are higher than the historical range. The analytical results for ammonia in groundwater samples are consistent with historical data and are within historical ranges (**Figures D-1.9 through D-1.12**).

Concentrations of ammonia in groundwater samples from locations GW-202D and PZ-16RR continue to decline from the maximum concentrations detected in 2008 and 2009 and concentrations in PZ-18R continue to fluctuate (**Figure D-1.9**) within range of historical results. Concentrations of ammonia in GW-79S also appear to have declined slightly but steadily since 2008 and 2009.

Concentrations of chloride, sulfate, and specific conductivity are consistent with historical data and are within historical ranges (**Figures D-1.13 through D-1.24**) with a few exceptions where increases in concentrations are noted. Concentrations of chloride, sulfate, and specific conductivity in groundwater samples from GW-202D and PZ-18R continue to fluctuate in a manner consistent with the other analytes (**Figures D-1.13, D-1.17, and D-1.21**). Concentrations of sulfate and values for specific conductivity in GW-79S also appear to have declined slightly but steadily since 2008 and 2009. Concentrations of chloride and values for specific conductivity west and upgradient of the Containment Area have increased since 2008 and 2009 at GW-43SR, GW-25, and GW-42S (MP-2#13) (**Figure D-1.15 and D-1.23**) and are interpreted to reflect industrial development activities and increased use of de-icing salts on adjacent properties since other parameters (aluminum, ammonia, chromium, sulfate) concentrations have not changed over the same period. Concentrations of chloride are also higher at PZ-18R upgradient of the weir during spring sampling events.

Groundwater levels were collected from select groundwater monitoring wells and piezometers prior to each sampling event. Water level measurements are tabulated in **Appendices A-1 and A-2**. These measurements and the interpreted groundwater potentiometric surfaces are depicted on **Figures 2-1 and 2-2**. The water levels and interpreted groundwater potentiometric surface for the second and third quarter of 2015 are consistent with prior periods.

2.2 Surface Water

The second and third quarter of 2015 Surry Wall/Cap sampling events include the collection of surface water samples from seven locations: ISCO-1, ISCO-2, ISCO-3, PZ-16RR, PZ-17RRR, PZ-18R, and SD-17. Unfiltered samples are analyzed by TAL for aluminum, chromium, sodium, ammonia, chloride, nitrate, nitrite, sulfate, and specific conductance. In addition, filtered surface water samples are analyzed for metals: aluminum, chromium, and sodium. QA/QC samples include one field duplicate and one MS/MSD. The sample locations, details of sampling, and the analytical program are identified in the field activity reports in **Appendices A-1 and A-2**.

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Table 2-3 and Table 2-4 summarize surface water analytical results for samples collected during the second and third quarter of 2015 sampling events. The surface water data validation memoranda are included in **Appendices B-1 and B-2** and conclude that TAL's results are useable as reported by the laboratory unless otherwise indicated in the validation report.

Appendix D-2 presents time series surface water concentration plots for dissolved aluminum, dissolved chromium, ammonia, chloride, sulfate, and specific conductivity from the Upper South Ditch and Lower South Ditch areas. These plots include historic data along with data from the second and third quarter of 2015 sampling events.

Detected concentrations and temporal patterns of the metals and inorganic parameters are consistent and within historical ranges from samples collected in the Upper South Ditch and Lower South Ditch. Dissolved aluminum, dissolved chromium, and ammonia in surface water from the Upper South Ditch and Lower South Ditch are within historical ranges (**Figures D-2.1 through D-2.6)**. Chloride, sulfate, and specific conductance concentrations in surface water samples are also within historical ranges in the Upper South Ditch and Lower South Ditch; however, concentrations in ISCO1 and PZ-18RSW tend be lower, being located upstream of the weir, behind which groundwater discharge is accentuated. Chloride concentrations appear to have increased slightly and gradually since 2008 and 2009 in Upper and Lower South Ditch consistent with increased use of de-icing road salt at commercial operations along adjacent Jewel Drive properties. Other parameters (sulfate, ammonia, aluminum, chromium) do not show similar patterns (**Figures D-2.7 through D-2.12)**.

2.3 Data Logger Data

Data loggers are deployed in 10 monitoring wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, GW-6S, PZ-24, and PZ-25, to continuously monitor groundwater elevation within and outside the Containment Area. **Appendix E** presents time series groundwater elevation plots (**Figure E-1 and Figure E-2**) compared to precipitation data measured at the Site. These plots include groundwater elevations from April 2015 through September 2015 and have been corrected for barometric pressure using Site specific barometric pressure data. The data acquisition rate remains one reading every hour.

Continuous water level data plots indicate groundwater within and outside of the Containment Area responds to recharge of the aquifer. Comparison of water levels in GW-35S and GW-CA1 indicates oscillating periods of inward and outward groundwater flow gradients through the equalization window from April 2015 through September 2015. Outflows occurred from April through mid-May; and during July. Inflows occurred in mid-May through June; and August through September.

2.4 Temporary Cap Inspections

Inspections of the temporary cap were conducted on June 16, 2015 and August 20, 2015 as part of the second and third quarter of 2015 sampling events. Full descriptions of the temporary cap inspections, including observations and necessary repairs completed on the temporary cap, are included in the field activity reports attached in **Appendix A**.

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3.0 PLANT B

The following sections present results of chemical analysis of groundwater for the second and third quarter of 2015 Plant B sampling events. Groundwater level data from these sampling events are presented in field activity reports contained in **Appendices A-1 and A-2**. The data validation memoranda for the second and third quarter of 2015 are provided in **Appendices B-1 and B-2,** respectively.

Olin personnel collected monthly water level, LNAPL thickness, LNAPL recovery data, and sampled the treatment plant influent and effluent in accordance with the Remediation General Permit (RGP) requirements. Samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total metals, hexavalent chromium, chloroform, total phenols, residual chlorine, total suspended solids (TSS), chloride, and pH. The analytical program for the RGP was described in the IRSWP (MACTEC, 2008). The analytical data for the RGP are retained on-Property by Olin in accordance with that permit. Plant B sampling frequencies continue on a monthly basis. Since November 2013, an ion exchange system has been used at Plant B to remove arsenic from the treated Plant B effluent. Treated groundwater is stored in on-Site frac tanks and sampling is completed from the frac tanks prior to discharge. A summary table of Plant B influent and frac tank data is presented in **Table 3-1**. The monthly water level and LNAPL thickness data (April 2015 – September 2015) are summarized in **Tables 3-4 and 3-5** and **Figures 3-1 through 3-12**.

East Ditch observations are made from the embankment on a daily basis during normal working days by the Olin staff that operates Plant B. The Plant B Water Treatment Plant Daily Report contains a check box for observation of LNAPL related sheens in the East Ditch. This check box is used if a sheen is observed. The daily report is an internal Plant B record of operating parameters for the treatment plant. Sheens in the East Ditch were not observed during the April 2015 through September 2015 monitoring period.

3.1 Groundwater

The second and third quarter of 2015 sampling events included groundwater sample collection from monitoring well GW-16R. The groundwater samples are collected and analyzed for trimethylpentenes, n-nitrosodiphenylamine (NDPhA), bis(2-ethylhexyl)phthalate (BEHP), volatile petroleum hydrocarbons (VPH), ammonia, iron, and pH. The second and third quarter of 2015 sample locations, details of sampling, and the analytical program are described in the field activity reports (**Appendices A-1 and A-2**, respectively). **Tables 3-2 and 3-3** present analytical results from the second and third quarter of 2015 groundwater sampling events, respectively. Data validation memoranda for these sampling events are included in **Appendix B** and indicate the analytical results are useable as reported by the laboratory unless otherwise indicated in the validation report.

Second and third quarter of 2015 analytical results for trimethylpentenes, NDPhA, BEHP, VPH, ammonia, iron, and pH in groundwater remain consistent with past results.

Olin personnel measure groundwater levels from 25 monitoring wells and three groundwater extraction wells (IW-11, IW-12, and IW-13) on a monthly frequency. If the water level probe suggests the presence of LNAPL, the thickness of the LNAPL is measured. The monthly water table elevation data are presented in **Tables 3-4 and 3-5** and in **Figures 3-1 through 3-6** during the April 2015 through September 2015 reporting period.

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3.2 Light Non-Aqueous Phase Liquid

The LNAPL layer in the vicinity of the Plant B treatment plant is extremely thin. A protocol for LNAPL thickness measurement and confirmation of LNAPL presence via visual observation was developed previously to address the interpretation of instrument response for what appears to be a very thin LNAPL layer at and below the meter sensitivity for detection (less than 0.01 feet). The LNAPL thickness measurement data are presented in **Figures 3-7 through 3-12** during the April 2015 through September 2015 reporting period. LNAPL has been observed in both the observation wells and groundwater extractions wells. A thin layer of LNAPL has been measured in wells GW-23, IW-11, and P5. Trace amounts of LNAPL (sheen) have been observed in wells IW-2, IW-3, IW-13, PID, and 12-IN.

The monthly LNAPL recovery data are presented in **Tables 3-4 and 3-5**. Over the reporting period, on average, 0.23 gallons of LNAPL is recovered per month. The total LNAPL recovered for the April 2015 through September 2015 period was 1.37 gallons (less than the previous six-month period). Monthly and cumulative LNAPL recovery data are summarized in **Figure 3-13**. Groundwater levels relative to monthly LNAPL recovery are plotted and summarized in **Figure 3-14**.

The LNAPL recovery data indicate a stabilization of the LNAPL recovery rate since 2008 with all the recovered LNAPL coming from IW-11. The proposed pumping rate reduction test to evaluate the effect of water levels on LNAPL recovery continues to be postponed.

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4.0 DAPL EXTRACTION PILOT TEST

This section reports progress on the DAPL Pilot Study and summarizes communication between Olin and USEPA for the reporting period (April 2015 through September 2015).

4.1 Operations Status

The DAPL Pilot Test was terminated on May 22, 2014. All of the equipment related to the pilot system was maintained in an operation-ready status. Subsequently Olin replaced the variable frequency drive for the extraction pump and voluntarily restarted the system on November 18, 2015 and is operating the system at a flow rate of 0.5 gpm.

4.2 Reporting Status

No additional reporting for the DAPL pilot system occurred during the reporting period.

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5.0 ADDITIONAL ACTIVITIES

During the reporting period for this SASR, Olin has submitted the following documents as described below. In addition, quarterly residential drinking water samples were collected from several residences in proximity of the Site. Additional Remedial Investigation (RI) activities that were conducted are also described.

5.1 Major Submittals, Meetings and Other RI/FS Activities

- On July 24, 2015 Olin submitted the Final OU1 & OU2 Remedial Investigation Report to USEPA.
- Olin has been engaged in obtaining access agreements for the installation of additional wells and investigation activities consistent with the OU3 data gap work plan.

No meetings were held with USEPA during the reporting period specific to RI/FS activities.

5.2 Residential Drinking Water Sampling

The following paragraphs summarize water supply sampling activities at residential locations in accordance with methods in the approved RI/FS Work Plan, and as modified by the Summary Report for the 2010 Residential Drinking Water Program and the Phase I Private Well Sampling proposal.

On April 16, 2015, private well location Map 3/Lot 2 was re-sampled for NDMA analysis (results are summarized in the Semi-Annual Status Report No. 16).

Private well sampling was completed on June 29th and 30th, 2015. Seven residences: Map 2/Lot 7, Map 15/Lot 2C, Map 24/Lot 54, Map 24/Lot 63, Map 24/Lot 64, Map 27/Lot 14, and Map 24/Lot 94 were sampled and analyzed for the following parameters: SVOCs, NDMA, N-nitroso di-n-propylamine (NDPrA), metals, hexavalent chromium, anions (chloride, sulfate, nitrate, nitrite), and ammonia. Three residences: Map 24/Lot 65, Map 24/Lot 66, and Map 24/Lot 72 were sampled and analyzed for: NDMA, NDPrA, metals, anions, and ammonia. One residence: Map 14/Lot 2B was sampled and analyzed for: NDMA, NDPrA, metals, hexavalent chromium, anions, and ammonia. Eight residences: Map 3/Lot 7, Map 1/Lot 6D, Map 1/Lot 6C, Map 3/Lot 2F, Map 3/Lot 2, Map 3/Lot 2D, Map 24/Lot 116, and Map 4/Lot 5C were sampled and analyzed for NDMA only.

Private well sampling was completed on Septemeber 28th through 30th, 2015 from the same residences and for the same analysis as listed above with one exception. Residence Map 4/Lot 5C is no longer sampled based on the past results.

Data from the June 2015 and September 2015 residential drinking water sampling events are summarized in **Tables 5-1 and 5-2**, respectively. The validation memoranda for the private well sampling events are attached in **Appendix B**.

5.3 Plant B Pumping Rate Reduction Test

The proposed Pumping Rate Reduction test which has been approved by USEPA remains on hold.

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5.4 OU1 and OU2 Remedial Investigation Sampling and Analytical Results

No additional OU1 and OU2 sampling activities have been completed during this reporting period. The OU1/ OU2 Remedial Investigation Report was submitted to EPA on July 24, 2015.

5.5 OU3 Remedial Investigation Groundwater Sampling and Analytical Results

Olin has been engaged in obtaining access agreements for the installation of additional wells and investigation activities consistent with the OU3 data gap work plan.

5.6 Calcium Sulfate Landfill

Consistent with the Massachusetts Department of Environmental Protection (MassDEP) approved semi-annual monitoring schedule (May and November), Olin conducted groundwater sampling at the Calcium Sulfate Landfill (CSL) in May 2015. Groundwater was collected from select monitoring wells identified in **Figure 5-1**. Samples were collected and submitted by Olin personnel for the following analysis: total dissolved solids (TDS), total metals (calcium, sodium, aluminum, manganese, iron, chromium, and nickel), chloride, sulfate, and alkalinity. The data validation memorandum for the CSL groundwater monitoring program is attached in **Appendix B**. The CSL data (2015-2016) will be summarized and submitted to MassDEP in the 2017 biennial report.

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6.0 REFERENCES

AMEC Environment & Infrastructure, Inc. (AMEC), 2012. Operations, Maintenance & Performance Monitoring Plan, DAPL Extraction Pilot Test for the Olin Chemical Superfund Site in Wilmington, MA, October 8, 2012.

MACTEC Engineering and Consulting, Inc. (MACTEC), 2008. *Final Interim Response Steps Work Plan*, *Olin Chemical Superfund Site, Wilmington, Massachusetts*. August 8, 2008.

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TABLES

Table 2-1
Slurry Wall/Cap Analytical Results for Second Quarter 2015 Groundwater Sampling
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Parameter Name	OC-DUP GW 202D 5/18/2015	OC-GW-202D 5/18/2015	OC-GW-202S 5/18/2015	OC-GW-78S 5/19/2015	OC-GW-79S 5/19/2015	OC-PZ-16RR 5/19/2015	OC-PZ-17RRR 5/19/2015	OC-PZ-24 5/18/2015
Metals, Filtered (mg/L)								
Aluminum	2.4	2.6	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	0.34	0.35	0.0033 J	0.0026 J	0.0071	0.0079	0.0054	0.022
Inorganics (mg/L)								
Chloride	280	280	120	16	160	120	15	15
Nitrogen, as Ammonia	200	160	29	31	73	94	35	38
Sulfate	1500	1500	170	430	860	670	420	630
Specific Conductance **(mS/cm)**	3.3	3.3	0.91	1.3	2.2	2.1	1.3	1.7

mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Table 2-1
Slurry Wall/Cap Analytical Results for Second Quarter 2015 Groundwater Sampling
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Wilmington, Massachusetts

Parameter Name	OC-PZ-25 5/18/2015	GW 201S 6/3/2015	OC GW24 5/26/2015	OC GW 25 5/26/2015	OC GW 34D 5/28/2015	OC GW 34D DUP 5/28/2015	OC GW 34SR 5/28/2015	OC GW 35S 5/28/2015
Metals, Filtered (mg/L)								
Aluminum	0.2 U	0.067 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.074 J
Chromium	0.011	0.049	0.005 U	0.008	0.015	0.014	0.0021 J	0.006
Inorganics (mg/L)								
Chloride	20	36	62	240	6.1	6.1	1.1	3.6 J
Nitrogen, as Ammonia	27	110	21	26	8.8	11	0.2 U	6.3
Sulfate	440	1000	24	52	27	27	6	340
Specific Conductance **(mS/cm)**	1.3	2.3	0.47	1.1	0.18	0.18	0.068	1

mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Table 2-1
Slurry Wall/Cap Analytical Results for Second Quarter 2015 Groundwater Sampling
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Parameter Name	OC GW 43SR 6/3/2015	OC GW 76S 5/26/2015	OC CA1 5/28/2015	MP 13 6/3/2015	OC PZ 18R 6/3/2015
Metals, Filtered (mg/L)					
Aluminum	0.32	0.19 J	0.2 U	0.77	0.2 U
Chromium	0.0014 J	0.0033 J	0.0091	0.023	0.041
Inorganics (mg/L)					
Chloride	290	12	5.1	330	590
Nitrogen, as Ammonia	3.6	6.2	0.21	45	300
Sulfate	29	42	40	200	1600
Specific Conductance **(mS/cm)**	1	0.21	0.45	1.6	4.6

mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Prepared by: KMS 12/2/2015
Checked by: LCG 12/17/2015

Table 2-2
Slurry Wall/Cap Analytical Results for Third Quarter 2015 Groundwater Sampling
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-GW-202D 8/18/2015	OC-GW-202S 8/18/2015	OC-GW-25 8/18/2015	OC-GW-78S 8/18/2015	OC-GW-79S 8/18/2015	OC-PZ-16RR 8/18/2015	OC-PZ-17RRR 8/18/2015	OC-PZ-18R 8/18/2015	PZ-24 8/18/2015	PZ-25 8/18/2015
Metals, Filtered (mg/L)										
Aluminum	1.8	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.089 J	0.2 U
Chromium	0.22	0.0029 J	0.0071	0.0025 J	0.014	0.0041 J	0.0066	0.025	0.018	0.01
Inorganics (mg/L)										
Chloride	270	160	230	15	260	230	17	220	13	25
Nitrogen, as Ammonia	200	46	42	52	83	100	47	80	50	42
Sulfate	1200	140	40	450	600	560	420	120	690	430
Specific Conductance **(mS/cm)**	2.8	0.95	0.96	1.3	2.1	2	1.3	1.3	1.7	1.3

Notes:
mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Prepared by: KMS 12/2/2015
Checked by: LCG 12/17/2015

Table 2-3
Slurry Wall/Cap Analytical Results for Second Quarter 2015 Surface Water Sampling
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
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Parameter Name	OC-ISCO1 5/27/2015	OC-ISCO2 5/27/2015	OC-ISCO3 5/27/2015	OC-PZ-16RRSW 5/27/2015	OC-PZ-17RRRSW 5/27/2015	OC-DUPSW 5/27/2015	OC-PZ-18RSW 5/27/2015	OC-SD-17 5/27/2015
Metals, Total (mg/L)								
Aluminum	0.1 J	9.4	0.15 J	0.9	3.4	0.063 J	0.13 J	2.6
Chromium	0.0083	1.3	0.005 U	0.22	0.77	0.0072	0.0089	0.58
Sodium	150	130 J	120 J	120 J	170	130 J	160	150 J
Metals, Filtered (mg/L)								
Aluminum	0.2 U	0.61	0.2 U	0.22	0.23	0.2 U	0.2 U	0.2
Chromium	0.0046 J	0.098	0.005 U	0.073	0.11	0.0042 J	0.0047 J	0.1
Sodium	160	210 J	140 J	190 J	170	150 J	160	170 J
Inorganics (mg/L)								
Chloride	290	280	310	260	230	290	290	440
Nitrate as N	0.05	0.65	0.72	1.1	1.6	0.038 J	0.044 J	1.7
Nitrite as N	0.05 U	0.025 J	0.05 U	0.027 J	0.026 J	0.05 U	0.05 U	0.024 J
Nitrogen, as Ammonia	21	70	0.63	56	45	25	22	34
Sulfate	130	570	27	490	370	130	130	660
Specific Conductance **(mS/cm)**	1.2	2	1.1	1.8	1.5	1.2	1.2	1.5

Notes:
mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - not detected,
value is the detection limit
J - value is estimated

Prepared by: KMS 12/2/2015
Checked by: LCG 12/17/2015

Table 2-4
Slurry Wall/Cap Analytical Results for Third Quarter 2015 Surface Water Sampling
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-ISCO1 8/19/2015	OC-ISCO2 8/19/2015	OC-ISCO3 8/19/2015	OC-PZ-16RRSW 8/19/2015	OC-PZ-17RRSW 8/19/2015	OC-PZ-18RSW 8/19/2015	OC-SD-17 8/19/2015
Metals, Total (mg/L)							
Aluminum	0.11 J	0.21	0.2 U	0.16 J	4.2	0.096 J	2.3
Chromium	0.0052	0.039	0.005 U	0.064	1	0.0055	0.55
Sodium	31	84	110	140	220	33	140
Metals, Filtered (mg/L)							
Aluminum	0.2 U	0.2 U	0.2 U	0.2 U	1.4	0.075 J	6.8
Chromium	0.0028 J	0.011	0.005 U	0.016	0.54	0.0073	1.6
Sodium	31	86	110	150	220	39	330
Inorganics (mg/L)							
Chloride	56	100	260	180	270	64	190
Nitrate as N	0.46	3.5	0.55	0.95	0.51	0.43	0.33
Nitrite as N	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Nitrogen, as Ammonia	8.4	33	1	100	120	5.6	81
Sulfate	18	240	13 J	480	710	21	370
Specific Conductance **(mS/cm)**	0.27	0.95	0.92	1.6	2.1	0.31	1.4

Notes:
mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - not detected,
value is the detection limit
J - value is estimated

Prepared by: KMS 12/2/2015
Checked by: LCG 12/17/2015

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2015 - September 2015)
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW OC F5-040215 4/2/2015	IDW OC F3-040715 4/7/2015	IDW OC F1-040915 4/9/2015	IDW OC F4-041315 4/13/2015	IDW OC F2 041515 4/15/2015	Plant B Influent OC INF-041515 4/15/2015	IDW OC F5-042015 4/20/2015	IDW OC F3-042215 4/22/2015	IDW OC F1-042415 4/24/2015
VOCs (mg/L)									
Tetrachloroethene									
Phenolics, Total Recoverable	0.005 U	0.0051 U	0.005 U	0.0051 U	0.005 U	0.0033 J	0.005 U	0.0051 U	0.005 U
SVOCs (mg/L)									
Bis(2-Ethylhexyl)phthalate	0.0019 U	0.0012 J	0.0025	0.0019 U	0.0019 U	0.014	0.019	0.0019 U	0.0019 U
Butylbenzylphthalate	0.00094 U	0.0024	0.00031 J	0.00024 J	0.00014 J	0.00019 J	0.00015 J	0.00095 U	0.00015 J
Di-n-butylphthalate	0.00094 U	0.00017 J	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.00095 U	0.00095 U	0.00095 U
Di-n-octylphthalate	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.0014	0.00095 U	0.00095 U
Diethylphthalate	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.00015 J	0.00094 U	0.00022 J	0.00095 U	0.00019 J B
Total Metals (mg/L)									
Arsenic	0.01 U	0.01 U	0.01 U	0.003 J	0.0032 J	0.0092 J	0.0036 J	0.0049 J	0.01 U
Barium									
Cadmium									
Chromium									
Iron	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	8.3 B	0.1 U	0.1 U	0.1 U
Nickel	0.0013 J	0.0012 J	0.04 U	0.04 U	0.04 U	0.0012 J	0.00093 J	0.00058 J	0.0009 J
Zinc	0.021	0.013 J	0.0094 J	0.013 J	0.011 J	0.0048 J	0.0091 J	0.011 J	0.012 J
Inorganic Compounds (mg/L)									
Chloride	110	110 B	120	130	140 B	160 B	140	140 B	120
Chlorine									
Total Suspended Solids	5 U	5 U	5 U	5 U	5 U	5	5 U	5 U	5 U

Notes:
mg/L - milligrams per liter
U - analyte not detected, value shown is detection limit
J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the control limits
HF - Field parameter with a holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2015 - September 2015)
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Parameter Name	IDW OC F2 042815 4/28/2015	IDW OC6-042915 4/29/2015	IDW OC F4-050115 5/1/2015	IDW OC F3-050615 5/6/2015	IDW OC F4-051315 5/13/2015	IDW OC F5-051815 5/18/2015	IDW OC F1 052115 5/21/2015	Plant B Influent OC INF 052115 5/21/2015	IDW OC F2 052615 5/26/2015
VOCs (mg/L)									
Tetrachloroethene									
Phenolics, Total Recoverable	0.0051 U	0.0051 U	0.0051 U	0.005 U	0.0053 U	0.0051 U	0.005 U	0.0051 U	0.0051 U
SVOCs (mg/L)									
Bis(2-Ethylhexyl)phthalate	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0047 U	0.24	0.0048 U
Butylbenzylphthalate	0.0002 J	0.00094 U	0.00014 J	0.00013 J B	0.00013 J	0.00094 U	0.0028 U	0.014 U	0.0029 U
Di-n-butylphthalate	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.0019 U	0.0094 U	0.0019 U
Di-n-octylphthalate	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.0047 U	0.024 U	0.0048 U
Diethylphthalate	0.00014 J	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.00094 U	0.00047 U	0.0024 U	0.00048 U
Total Metals (mg/L)									
Arsenic	0.01 U	0.01 U	0.0031 J	0.01 U	0.01 U	0.0053 J	0.01 U	0.012	0.01 U
Barium									
Cadmium									
Chromium									
Iron	0.06 J	0.1 U	0.1 U	0.1 U	0.04 J B	0.015 J B	0.05 U	14	0.05 U
Nickel	0.00069 J	0.04 U	0.00084 J	0.04 U	0.00083 J	0.00079 J B	0.01 U	0.0018 J	0.01 U
Zinc	0.018 J	0.0095 J	0.011 J	0.0092 J	0.013 J	0.012 J	0.0099 J	0.0074 J	0.013
Inorganic Compounds (mg/L)									
Chloride	150	140	150	140	150	140			
Chlorine							130	210	150
Total Suspended Solids	5 U	5 U	5 U	5 U	5 U	2 J	5 U	22	5 U

Notes:
mg/L - milligrams per liter
U - analyte not detected, value shown is detection limit
J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the control limits
HF - Field parameter with a holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2015 - September 2015)
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Wilmington, Massachusetts

Parameter Name	IDW OC F4 060315 6/3/2015	IDW OC F3 060515 6/5/2015	IDW OC F5 061015 6/10/2015	IDW OC F1 061715 6/17/2015	IDW OC F2 061815 6/18/2015	Plant B Influent OC INF 061815 6/18/2015	IDW OC F4 062315 6/23/2015	IDW OC F3 062515 6/25/2015	IDW OC F5 062915 6/29/2015
VOCs (mg/L)									
Tetrachloroethene									
Phenolics, Total Recoverable	0.005 U	0.005 U	0.0052 U	0.005 U	0.0034 J	0.0048 J	0.005 U	0.0035 J	0.0079 B
SVOCs (mg/L)									
Bis(2-Ethylhexyl)phthalate	0.0014 J	0.0028 J	0.0047 U	0.00075 J	0.002 J	0.041 J	0.0021 J	0.0062	0.0011 J
Butylbenzylphthalate	0.00019 J	0.0028 U *	0.0028 U	0.0029 U	0.0028 U	0.0029 U	0.0029 U	0.0032 U	0.0028 U
Di-n-butylphthalate	0.0019 U	0.0019 U *	0.0019 U	0.0019 U	0.0018 U	0.0019 U	0.0019 U	0.0022 U	0.0019 U
Di-n-octylphthalate	0.0047 U	0.0047 U	0.0047 U	0.0048 U	0.0046 U	0.0048 U	0.0048 U	0.0054 U	0.0047 U
Diethylphthalate	0.00047 U	0.00047 U	0.00047 U	0.00048 U	0.00046 U	0.00048 U	0.00048 U	0.00054 U	0.00047 U
Total Metals (mg/L)									
Arsenic	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0072 J	0.01 U	0.01 U	0.01 U
Barium									
Cadmium									
Chromium									
Iron	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	9.9	0.05 U	0.05 U	0.05 U
Nickel	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0036 J	0.01 U	0.0017 J	0.0013 J
Zinc	0.015 B	0.015	0.014	0.014	0.015	0.0093 J	0.012	0.014	0.0085 J
Inorganic Compounds (mg/L)									
Chloride									
Chlorine	160	160	170	180 B	180 B	83 B	170 B	160	150
Total Suspended Solids	5 U	5 U	5 U	5 U	5 U	14	5 U	5 U	5 U

Notes:
mg/L - milligrams per liter
U - analyte not detected, value shown is detection limit
J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the control limits
HF - Field parameter with a holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2015 - September 2015)
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Parameter Name	IDW OC F1 070615 7/6/2015	IDW OC F6 070615 7/6/2015	IDW OC F2 070815 7/8/2015	IDW OCF4 070915 7/9/2015	IDW OC F5 071515 7/15/2015	IDW OC F6 071615 7/16/2015	Plant B Influent OC INF 071615 7/16/2015	IDW OC F3 072115 7/21/2015	IDW OC F2 072415 7/23/2015
VOCs (mg/L)									
Tetrachloroethene									
Phenolics, Total Recoverable	0.005 U	0.005 U	0.005 U	0.0028 J	0.005 U	0.0085	0.005 U	0.005 U	0.005 U
SVOCs (mg/L)									
Bis(2-Ethylhexyl)phthalate	0.0014 J	0.0048 U	0.0048 U	0.0071	0.0047	0.0048 U	0.033 J	0.00066 J B	0.0051
Butylbenzylphthalate	0.0028 U	0.0029 U	0.0029 U	0.0029 U	0.0028 U	0.0029 U	0.0028 U	0.0028 U	0.0028 U
Di-n-butylphthalate	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U
Di-n-octylphthalate	0.0047 U	0.0048 U	0.0048 U	0.0048 U	0.0047 U	0.0048 U	0.0047 U	0.0047 U	0.0047 U
Diethylphthalate	0.00047 U	0.00048 U	0.00048 U	0.00048 U	0.00047 U	0.00048 U	0.00047 U	0.00047 U	0.00047 U
Total Metals (mg/L)									
Arsenic	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0083 J	0.0082 J	0.01 U	0.01 U
Barium									
Cadmium									
Chromium									
Iron	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	7	6.8	0.05 U	0.05 U
Nickel	0.0016 J	0.01 U	0.01 U	0.01 U	0.0014 J	0.0022 J	0.0022 J	0.0018 J	0.0016 J
Zinc	0.014 B	0.01 U	0.01	0.0094 J	0.011	0.0052 J	0.0045 J	0.039	0.011
Inorganic Compounds (mg/L)									
Chloride									
Chlorine	160	170	160	170	170	160	190	180	180
Total Suspended Solids	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

Notes:
mg/L - milligrams per liter
U - analyte not detected, value shown is detection limit
J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the control limits
HF - Field parameter with a holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2015 - September 2015)
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Parameter Name	IDW OC METALS 04 7/23/2015	IDW WELL PURGE WATER 7/23/2015	IDW OC F1 072715 7/27/2015	IDW OC F4 080315 8/3/2015	IDW OC F3 081115 8/11/2015	IDW OC F5-081215 8/12/2015	IDW OC F4-081315 8/13/2015	Plant B Influent OC INF-81315 8/13/2015
VOCs (mg/L)								
Tetrachloroethene		0.002						
Phenolics, Total Recoverable			0.005 U	0.005 U	0.005 U	0.0053	0.005 U	0.0098
SVOCs (mg/L)								
Bis(2-Ethylhexyl)phthalate			0.0032 J	0.005	0.0029 J	0.00067 J	0.0015 J	0.096
Butylbenzylphthalate			0.00024 J	0.0028 U	0.00018 J B	0.0028 U	0.0028 U	0.014 U
Di-n-butylphthalate			0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0095 U
Di-n-octylphthalate			0.00019 J	0.0047 U	0.0047 U	0.0047 U	0.0047 U	0.024 U
Diethylphthalate			0.00047 U	0.00047 U	0.00047 U	0.00047 U	0.00047 U	0.0024 U
Total Metals (mg/L)								
Arsenic	0.01 U	0.021	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0075 J
Barium		0.039						
Cadmium		0.0031						
Chromium		6.2						
Iron	0.044 J		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	6.3
Nickel	0.01 U		0.01 U	0.0036 J	0.0019 J	0.0027 J	0.0016 J	0.0017 J
Zinc	0.01 U		0.012 B	0.01	0.021	0.018	0.018	0.0044 J
Inorganic Compounds (mg/L)								
Chloride								
Chlorine			190	190	170	180	190	180
Total Suspended Solids			5 U	5 U	5 U	5 U	5 U	4 J

Notes:
mg/L - milligrams per liter
U - analyte not detected, value shown is detection limit
J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the control limits
HF - Field parameter with a holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2015 - September 2015)
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Parameter Name	IDW OC-F3-082415 8/24/2015	IDW OC T5 090315 9/3/2015	Plant B Influent INF-091815 9/18/2015	IDW OC FRAC 4 092215 9/22/2015
VOCs (mg/L)				
Tetrachloroethene				
Phenolics, Total Recoverable	0.005 U	0.005 U	0.013	0.005 U
SVOCs (mg/L)				
Bis(2-Ethylhexyl)phthalate	0.005 U	0.0047 U	0.012 J B *	0.0063 B
Butylbenzylphthalate	0.003 U	0.0028 U	0.0028 U	0.0029 U
Di-n-butylphthalate	0.002 U	0.0019 U	0.0019 U	0.0019 U
Di-n-octylphthalate	0.005 U	0.0047 U	0.0047 U	0.0048 U
Diethylphthalate	0.0005 U	0.00047 U	0.00047 U	0.00048 U
Total Metals (mg/L)				
Arsenic	0.01 U	0.01 U	0.0084 J	0.01 U
Barium				
Cadmium				
Chromium				
Iron	0.05 U	0.05 U	7.3	0.027 J
Nickel	0.01 U	0.01 U	0.002 J	0.01 U
Zinc	0.01 U	0.01 U	0.0055 J	0.0097 J B
Inorganic Compounds (mg/L)				
Chloride				
Chlorine	190	180	140	190
Total Suspended Solids	5 U	5 U	2 J	5 U

Notes:
mg/L - milligrams per liter
U - analyte not detected, value shown is detection limit
J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the control limits
HF - Field parameter with a holding time of 15 minutes
E - Exceeded the calibration range

Prepared by: KMS 12/2/2015
Checked by: LCG 12/17/2015

Table 3-2
Plant B Analytical Results for Second Quarter 2015 Groundwater Sampling
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	GW-16R OC-GW-16R 5/27/2015
Volatile Organics (mg/L)	
2,4,4-Trimethyl-1-pentene	1.7
2,4,4-Trimethyl-2-pentene	0.51
Semivolatile Organics (mg/L)	
Bis(2-Ethylhexyl)phthalate	0.0053 U
N-Nitrosodiphenylamine	0.0015 J
Metals, Filtered (mg/L)	
Iron	1.9
Inorganics (mg/L)	
Nitrogen, as Ammonia	3.7
pH	6.09 J
Volatile Petroleum Hydrocarbons (mg/L)	
Ethylbenzene	0.1 U
Toluene	0.1 U
Methyl Tertbutyl Ether	0.1 U
Xylenes (m&p)	0.2 U
Benzene	0.1 U
Naphthalene	0.1 U
Xylene, o	0.1 U
C9-C12 Aliphatics	0.5 U
C5-C8 Aliphatics	1.2
C5-C8 Aliphatics (unadj.)	1.2
C9-C10 Aromatics (unadj.)	0.5 U
C9-C12 Aliphatics (unadj.)	0.5 U

Notes:
mg/L - milligrams per liter
U - analyte not detected,
value shown is reporting limit.
J - value is estimated

Prepared by: KMS 12/2/2015
Checked by: LCG 12/17/2015

Table 3-3
Plant B Analytical Results for Third Quarter 2015 Groundwater Sampling
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	GW-16R OC-GW-16R 8/19/2015
Volatile Organics (mg/L)	
2,4,4-Trimethyl-1-pentene	1.8
2,4,4-Trimethyl-2-pentene	0.59
Semivolatile Organics (mg/L)	
Bis(2-Ethylhexyl)phthalate	0.0048 U
N-Nitrosodiphenylamine	0.15 J
Metals, Filtered (mg/L)	
Iron	1.9
Inorganics (mg/L)	
Ammonia	3.8
Volatile Petroleum Hydrocarbons (mg/L)	
Ethylbenzene	0.01 U
Toluene	0.0028 J
Methyl Tertbutyl Ether	0.01 U
Xylenes (m&p)	0.02 U
Benzene	0.01 U
Naphthalene	0.01 U
Xylene, o	0.01 U
C9-C12 Aliphatics	0.016 J
C5-C8 Aliphatics	0.98
C9-C10 Aromatics	0.0066 J
C5-C8 Aliphatics (unadj.)	0.97
C9-C12 Aliphatics (unadj.)	0.016 J

Notes:
mg/L - milligrams per liter
J - value is estimated

Prepared by: KMS 12/2/2015
Checked by: LCG 12/17/2015

Table 3-4
Plant B Water Level and Product Recovery Data: April 2015 - June 2015 [1]
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Well	Depth to Water feet[2]			Depth to Product feet[2]			Product Thickness feet[3, 4]			Reference Elevation	Potentiometric Surface Elevation (feet NGVD) Corrected for Product [5]			Product Removed gallons		
ID	4/30/2015	5/27/2015	6/30/2015	4/30/2015	5/27/2015	6/30/2015	4/30/2015	5/27/2015	6/30/2015	feet	4/30/2015	5/27/2015	6/30/2015	4/30/2015	5/27/2015	6/30/2015
B-2	11.10	11.38	11.64	NPD	NPD	NPD	NA	NA	NA	90.48	79.38	79.10	78.84			
B-3	10.43	10.74	11.15	NPD	NPD	NPD	NA	NA	NA	90.32	79.89	79.58	79.17			
B-5R	10.68	10.98	11.32	NPD	NPD	NPD	NA	NA	NA	91.38	80.70	80.40	80.06			
B-7A	7.17	7.65	7.80	NPD	NPD	NPD	NA	NA	NA	88.81	81.64	81.16	81.01			
B-17	8.12	9.34	9.54	NPD	NPD	NPD	NA	NA	NA	91.55	83.43	82.21	82.01			
GW-13	10.77	11.10	11.42	NPD	NPD	NPD	NA	NA	NA	90.57	79.80	79.47	79.15			
GW-14	7.80	9.03	9.24	NPD	NPD	NPD	NA	NA	NA	88.70	80.90	79.67	79.46			
GW-15	6.86	8.74	8.58	NPD	NPD	NPD	NA	NA	NA	90.01	83.15	81.27	81.43			
GW-16R	9.76	10.67	10.71	NPD	NPD	NPD	NA	NA	NA	92.46	82.70	81.79	81.75			
GW-23	10.66	10.84	11.21	10.62	10.78	11.17	0.04	0.06	0.04	91.04	80.42	80.26	79.87			
GW-52S	6.68	8.62	8.89	NPD	NPD	NPD	NA	NA	NA	87.95	81.27	79.33	79.06			
GW-100	10.83	11.15	11.55	NPD	NPD	NPD	NA	NA	NA	90.15	79.32	79.00	78.60			
GW-101	10.88	11.29	11.63	NPD	NPD	NPD	NA	NA	NA	90.14	79.26	78.85	78.51			
GW-102	9.73	10.05	10.41	NPD	NPD	NPD	NA	NA	NA	89.00	79.27	78.95	78.59			
IW-1	10.89	11.20	11.68	NPD	NPD	NPD	NA	NA	NA	90.71	79.82	79.51	79.03			
IW-2	10.87	11.31	11.78	10.87	11.31	11.78	Trace	Trace	Trace	90.53	79.67	79.23	78.76			
IW-3	11.03	11.44	11.89	11.03	11.44	11.89	Trace	Trace	Trace	90.76	79.74	79.33	78.88			
IW-6	10.02	10.29	10.79	NPD	NPD	NPD	NA	NA	NA	89.15	79.13	78.86	78.36			
IW-7	10.71	11.07	11.72	NPD	NPD	NPD	NA	NA	NA	90.10	79.39	79.03	78.38			
IW-8	10.60	11.06	11.53	NPD	NPD	NPD	NA	NA	NA	89.94	79.34	78.88	78.41			
IW-9	10.34	10.74	11.21	NPD	NPD	NPD	NA	NA	NA	89.78	79.44	79.04	78.57			
IW-10	11.01	11.28	11.70	NPD	NPD	NPD	NA	NA	NA	90.43	79.42	79.15	78.73			
IW-11	10.82	13.58	14.39	10.8	13.54	14.37	0.02	0.04	0.02	89.92	79.12	76.38	75.55	0.29	0.33	0.21
IW-12	10.97	11.31	13.38	NPD	NPD	NPD	NA	NA	NA	90.31	79.34	79.00	76.93			
IW-13	10.48	10.80	19.60	10.48	10.8	19.6	Trace	Trace	Trace	89.90	79.43	79.11	70.31			
PID	10.61	10.99	11.61	10.61	10.99	11.61	Trace	Trace	Trace	89.97	79.37	78.99	78.37			
P5	10.93	11.38	11.82	10.93	11.36	11.80	Trace	0.02	0.02	90.45	79.53	79.09	78.65			
12-IN	10.18	10.58	10.98	10.18	10.58	10.98	Trace	Trace	Trace	89.84	79.67	79.27	78.87			
											Recovered Product For Month			0.29	0.33	0.21

Notes:
NPD - No Product Detected; NA - Not Applicable;
1 - Groundwater measurements and product recovery data collected by Olin
2 - Measurement collected from top of PVC; if well does not have PVC casing, measurement taken from top of steel casing
3 - Collected using ORS brand oil/water interface probe
4 - Sheens noted at wells are assigned a product thickness of 0.01 feet
5 - Correction equation used: Reference elevation - (depth to water - (product thickness X 0.95))

Prepared by / Date: LCG 12/1/15
Checked by / Date: BJR 12/17/15

Table 3-5
Plant B Water Level and Product Recovery Data: April 2015 - September 2015 [1]
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Well	Depth to Water feet[2]			Depth to Product feet[2]			Product Thickness feet[3, 4]			Reference Elevation	Potentiometric Surface Elevation (feet NGVD) Corrected for Product [5]			Product Removed gallons		
ID	7/31/2015	8/31/2015	9/30/2015	7/31/2015	8/31/2015	9/30/2015	7/31/2015	8/31/2015	9/30/2015	feet	7/31/2015	8/31/2015	9/30/2015	7/31/2015	8/31/2015	9/30/2015
B-2	11.78	11.73	11.60	NPD	NPD	NPD	NA	NA	NA	90.48	78.70	78.75	78.88			
B-3	11.37	11.31	11.14	NPD	NPD	NPD	NA	NA	NA	90.32	78.95	79.01	79.18			
B-5R	11.99	11.89	11.48	NPD	NPD	NPD	NA	NA	NA	91.38	79.39	79.49	79.90			
B-7A	8.75	8.68	8.28	NPD	NPD	NPD	NA	NA	NA	88.81	80.06	80.13	80.53			
B-17	10.88	10.37	11.15	NPD	NPD	NPD	NA	NA	NA	91.55	80.67	81.18	80.40			
GW-13	11.64	11.52	11.40	NPD	NPD	NPD	NA	NA	NA	90.57	78.93	79.05	79.17			
GW-14	9.80	9.62	9.62	NPD	NPD	NPD	NA	NA	NA	88.70	78.90	79.08	79.08			
GW-15	9.80	9.61	10.06	NPD	NPD	NPD	NA	NA	NA	90.01	80.21	80.40	79.95			
GW-16R	11.81	11.43	11.85	NPD	NPD	NPD	NA	NA	NA	92.46	80.65	81.03	80.61			
GW-23	11.19	11.22	11.20	11.14	11.16	11.14	0.05	0.06	0.06	91.04	79.90	79.88	79.90			
GW-52S	9.36	9.20	9.19	NPD	NPD	NPD	NA	NA	NA	87.95	78.59	78.75	78.76			
GW-100	11.35	11.44	11.50	NPD	NPD	NPD	NA	NA	NA	90.15	78.80	78.71	78.65			
GW-101	11.39	11.52	11.53	NPD	NPD	NPD	NA	NA	NA	90.14	78.75	78.62	78.61			
GW-102	10.22	10.35	10.21	NPD	NPD	NPD	NA	NA	NA	89.00	78.78	78.65	78.79			
IW-1	11.80	11.74	11.49	NPD	NPD	NPD	NA	NA	NA	90.71	78.91	78.97	79.22			
IW-2	11.65	11.70	11.64	11.65	NPD	11.64	Trace	NA	Trace	90.53	78.89	78.83	78.90			
IW-3	11.80	11.82	11.81	11.8	NPD	11.81	Trace	NA	Trace	90.76	78.97	78.94	78.96			
IW-6	10.53	10.64	10.75	NPD	NPD	NPD	NA	NA	NA	89.15	78.62	78.51	78.40			
IW-7	11.26	11.53	11.65	NPD	NPD	NPD	NA	NA	NA	90.10	78.84	78.57	78.45			
IW-8	11.12	11.34	11.41	NPD	NPD	NPD	NA	NA	NA	89.94	78.82	78.60	78.53			
IW-9	10.95	11.39	11.13	NPD	NPD	NPD	NA	NA	NA	89.78	78.83	78.39	78.65			
IW-10	11.61	11.66	11.65	NPD	NPD	NPD	NA	NA	NA	90.43	78.82	78.77	78.78			
IW-11	13.43	13.36	13.58	13.4	13.31	13.55	0.03	0.05	0.03	89.92	76.52	76.61	76.37	0.36	0.13	0.05
IW-12	11.56	11.65	13.15	NPD	NPD	NPD	NA	NA	NA	90.31	78.75	78.66	77.16			
IW-13	11.13	12.21	19.59	11.13	NPD	19.59	Trace	NA	Trace	89.90	78.78	77.69	70.32			
PID	11.17	11.40	11.51	11.17	NPD	11.51	Trace	NA	Trace	89.97	78.81	78.57	78.47			
P5	12.63	12.33	11.71	12.63	NPD	11.71	Trace	NA	Trace	90.45	77.83	78.12	78.75			
12-IN	10.98	10.91	10.95	10.98	10.91	10.95	Trace	Trace	Trace	89.84	78.87	78.94	78.90			
											Recovered Product For Month			0.36	0.13	0.050

Notes:
NPD - No Product Detected; NA - Not Applicable
1 - Groundwater measurements and product recovery data collected by Olin
2 - Measurement collected from top of PVC; if well does not have PVC casing, measurement taken from top of steel casing
3 - Collected using ORS brand oil/water interface probe
4 - Sheens noted at wells are assigned a product thickness of 0.01 feet
5 - Correction equation used: Reference elevation - (depth to water - (product thickness X 0.95))

Prepared by / Date: LCG 12/1/2015
Checked by / Date: BJR 12/17/15

Table 5-1
Private Well Analytical Results for the Second Quarter 2015
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-M01L6C 6/29/2015	OC-M01L6D 6/29/2015	OC-M02L07 6/29/2015	OC-M03L02 6/29/2015	OC-M03L2D 6/29/2015	OC-M03L2F 6/29/2015	OC-M03L07 6/29/2015	OC-M04L5C 6/30/2015	OC-M014L2B 6/29/2015	OC-M15L2C 6/29/2015	OC-M24L116 6/30/2015
Semivolatile Organics (mg/L)											
1,2,4,5-Tetrachlorobenzene			0.00095 U							0.00095 U	
1,2-Dichlorobenzene			0.00095 U							0.00095 U	
1-Methylnaphthalene			0.00019 U							0.00019 U	
2,2'-Dichlorodiisopropylether			0.00095 U							0.00095 U	
2,3,4,6-Tetrachlorophenol			0.0095 U							0.0095 U	
2,4,5-Trichlorophenol			0.0048 U							0.0048 U	
2,4,6-Trichlorophenol			0.0048 U							0.0048 U	
2,4-Dichlorophenol			0.0019 U							0.0019 U	
2,4-Dimethylphenol			0.0019 U							0.0019 U	
2,4-Dinitrophenol			0.0048 U							0.0048 U	
2,4-Dinitrotoluene			0.0048 U							0.0048 U	
2,6-Dinitrotoluene			0.0048 U							0.0048 U	
2-Chloronaphthalene			0.00095 U							0.00095 U	
2-Chlorophenol			0.00095 U							0.00095 U	
2-Methylnaphthalene			0.00019 U							0.00019 U	
2-Methylphenol			0.00095 U							0.00095 U	
2-Nitroaniline			0.0019 U							0.0019 U	
2-Nitrophenol			0.0019 U							0.0019 U	
3 & 4 Methylphenol			0.0019 U							0.0019 U	
3,3'-Dichlorobenzidine			0.0048 U							0.0048 U	
3-Nitroaniline			0.0019 U							0.0019 U	
4,6-Dinitro-2-methylphenol			0.0048 U							0.0048 U	
4-Bromophenyl phenyl ether			0.0019 U							0.0019 U	
4-Chloro-3-methylphenol			0.0019 U							0.0019 U	
4-Chloroaniline			0.0019 U							0.0019 U	
4-Chlorophenyl phenyl ether			0.0019 U							0.0019 U	
4-Nitroaniline			0.0019 U							0.0019 U	
4-Nitrophenol			0.0048 U							0.0048 U	
Acenaphthene			0.00019 U							0.00019 U	
Acenaphthylene			0.00019 U							0.00019 U	
Acetophenone			0.00095 U							0.00095 U	
Aniline			0.0048 U							0.0048 U	
Anthracene			0.00019 U							0.00019 U	
Atrazine			0.00095 U							0.00095 U	
Azobenzene			0.0095 U							0.0095 U	
Benzaldehyde			0.00095 U							0.00095 U	
Benzo(a)anthracene			0.00019 U							0.00019 U	
Benzo(a)pyrene			0.00019 U							0.00019 U	
Benzo(b)fluoranthene			0.00019 U							0.00019 U	
Benzo(ghi)perylene			0.00019 U							0.00019 U	
Benzo(k)fluoranthene			0.00019 U							0.00019 U	
Benzoic Acid			0.024 UJ							0.024 UJ	
Benzyl alcohol			0.0048 U							0.0048 U	
Biphenyl			0.00095 U							0.00095 U	
Bis(2-Chloroethoxy)methane			0.00095 U							0.00095 U	
Bis(2-Chloroethyl)ether			0.00095 U							0.00095 U	

Table 5-1
Private Well Analytical Results for the Second Quarter 2015
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-M01L6C 6/29/2015	OC-M01L6D 6/29/2015	OC-M02L07 6/29/2015	OC-M03L02 6/29/2015	OC-M03L2D 6/29/2015	OC-M03L2F 6/29/2015	OC-M03L07 6/29/2015	OC-M04L5C 6/30/2015	OC-M014L2B 6/29/2015	OC-M15L2C 6/29/2015	OC-M24L116 6/30/2015
Bis(2-Ethylhexyl)phthalate			0.002 J							0.0018 J	
Butylbenzylphthalate			0.0019 U							0.0019 U	
Caprolactam			0.0048 UJ							0.0048 UJ	
Carbazole			0.00095 U							0.00095 U	
Chrysene			0.00019 U							0.00019 U	
Di-n-butylphthalate			0.0048 U							0.0048 U	
Di-n-octylphthalate			0.0019 U							0.0019 U	
Dibenz(a,h)anthracene			0.00019 U							0.00019 U	
Dibenzofuran			0.00095 U							0.00095 U	
Diethylphthalate			0.0019 U							0.0019 U	
Dimethylphthalate			0.0019 U							0.0019 U	
Diphenyl ether			0.0095 U							0.0095 U	
Diphenylmethanone			0.0048 U							0.0048 U	
Fluoranthene			0.00019 U							0.00019 U	
Fluorene			0.00019 U							0.00019 U	
Hexachlorobenzene			0.00019 U							0.00019 U	
Hexachlorocyclopentadiene			0.0095 U							0.0095 U	
Hexachloroethane			0.00095 U							0.00095 U	
Indeno(1,2,3-cd)pyrene			0.00019 U							0.00019 U	
Isophorone			0.00095 U							0.00095 U	
N-Nitrosodi-n-propylamine			0.00095 U							0.00095 U	
N-Nitrosodiphenylamine			0.00095 U							0.00095 U	
Nitrobenzene			0.00095 U							0.00095 U	
Pentachlorophenol			0.0048 U							0.0048 U	
Phenanthrene			0.00019 U							0.00019 U	
Phenol			0.00095 U							0.00095 U	
Pyrene			0.00019 U							0.00019 U	
NDMA/NDPA (ng/L)											
N-Nitrosodi-n-propylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
N-Nitrosodimethylamine	1.9 U	1.9 U	1.9 U	1.9 U	2.2	1.1 J	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Metals, Total (mg/L)											
Chromium			0.001 J						0.00099 J	0.0011 J	
Chromium, Hexavalent			0.005 U						0.005 U	0.005 U	
Sodium			8.3						24	19	
Inorganics (mg/L)											
Chloride			20						15	98	
Nitrate as N			6 J						0.05 UJ	0.05 UJ	
Nitrite as N			0.25 UJ						0.05 UJ	0.05 UJ	
Nitrogen, as Ammonia			0.25 U						0.25 U	0.25 U	
Sulfate			15						48	24	

Notes:
mg/L - milligram per liter
ng/L = nanograms per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated
R - value is rejected

Table 5-1
Private Well Analytical Results for the Second Quarter 2015
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-M24L54 6/29/2015	OC-M24L63 6/29/2015	OC-M24L64 6/29/2015	OC-M24L65 6/29/2015	OC-M24L66 6/29/2015	OC-M24L72A 6/29/2015	OC-M24L94 6/29/2015	OC-M27L14C 6/29/2015
Semivolatile Organics (mg/L)								
1,2,4,5-Tetrachlorobenzene	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
1,2-Dichlorobenzene	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
1-Methylnaphthalene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
2,2'-Dichlorodiisopropylether	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
2,3,4,6-Tetrachlorophenol	0.0095 U	0.0095 U	0.0096 U				0.0096 U	0.0095 UJ
2,4,5-Trichlorophenol	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
2,4,6-Trichlorophenol	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
2,4-Dichlorophenol	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
2,4-Dimethylphenol	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
2,4-Dinitrophenol	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
2,4-Dinitrotoluene	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
2,6-Dinitrotoluene	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
2-Chloronaphthalene	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
2-Chlorophenol	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
2-Methylnaphthalene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
2-Methylphenol	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
2-Nitroaniline	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
2-Nitrophenol	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
3 & 4 Methylphenol	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
3,3'-Dichlorobenzidine	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
3-Nitroaniline	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
4,6-Dinitro-2-methylphenol	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
4-Bromophenyl phenyl ether	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
4-Chloro-3-methylphenol	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
4-Chloroaniline	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
4-Chlorophenyl phenyl ether	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
4-Nitroaniline	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
4-Nitrophenol	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
Acenaphthene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Acenaphthylene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Acetophenone	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Aniline	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
Anthracene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Atrazine	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Azobenzene	0.0095 U	0.0095 U	0.0096 U				0.0096 U	0.0095 UJ
Benzaldehyde	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Benzo(a)anthracene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Benzo(a)pyrene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Benzo(b)fluoranthene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Benzo(ghi)perylene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Benzo(k)fluoranthene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Benzoic Acid	0.024 UJ	0.024 UJ	0.024 UJ				0.024 UJ	0.024 UJ
Benzyl alcohol	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
Biphenyl	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Bis(2-Chloroethoxy)methane	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Bis(2-Chloroethyl)ether	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ

Table 5-1
Private Well Analytical Results for the Second Quarter 2015
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-M24L54 6/29/2015	OC-M24L63 6/29/2015	OC-M24L64 6/29/2015	OC-M24L65 6/29/2015	OC-M24L66 6/29/2015	OC-M24L72A 6/29/2015	OC-M24L94 6/29/2015	OC-M27L14C 6/29/2015
Bis(2-Ethylhexyl)phthalate	0.0017 J	0.0018 J	0.0018 J				0.0048 U	0.0048 UJ
Butylbenzylphthalate	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
Caprolactam	0.0048 UJ	0.0048 UJ	0.0048 UJ				0.0048 UJ	0.0048 UJ
Carbazole	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Chrysene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Di-n-butylphthalate	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
Di-n-octylphthalate	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
Dibenz(a,h)anthracene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Dibenzofuran	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Diethylphthalate	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
Dimethylphthalate	0.0019 U	0.0019 U	0.0019 U				0.0019 U	0.0019 UJ
Diphenyl ether	0.0095 U	0.0095 U	0.0096 U				0.0096 U	0.0095 UJ
Diphenylmethanone	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
Fluoranthene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Fluorene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Hexachlorobenzene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Hexachlorocyclopentadiene	0.0095 U	0.0095 U	0.0096 U				0.0096 U	0.0095 UJ
Hexachloroethane	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Indeno(1,2,3-cd)pyrene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Isophorone	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
N-Nitrosodi-n-propylamine	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
N-Nitrosodiphenylamine	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Nitrobenzene	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Pentachlorophenol	0.0048 U	0.0048 U	0.0048 U				0.0048 U	0.0048 UJ
Phenanthrene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
Phenol	0.00095 U	0.00095 U	0.00096 U				0.00096 U	0.00095 UJ
Pyrene	0.00019 U	0.00019 U	0.00019 U				0.00019 U	0.00019 UJ
NDMA/NDPA (ng/L)								
N-Nitrosodi-n-propylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
N-Nitrosodimethylamine	9.4	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	13	1.9 U
Metals, Total (mg/L)								
Chromium	0.0022 J	0.0016 J	0.0016 J	0.0014 J	0.0013 J	0.0011 J	0.00099 J	0.0016 J
Chromium, Hexavalent	0.005 U	0.005 U	0.005 U				0.005 U	0.005 U
Sodium	29	25	23	23	26	20	55	35
Inorganics (mg/L)								
Chloride	77	130	120	99	120	110	92	140
Nitrate as N	0.052 J	0.52 J	0.69 J	0.37 J	0.18 J	0.48 J	1.3 J	0.05 UJ
Nitrite as N	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Nitrogen, as Ammonia	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Sulfate	24	18	18	23	15	18	18	35

Notes:
mg/L - milligram per liter
ng/L = nanograms per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated
R - value is rejected

Prepared by: KMS 12/2/2015
Checked by: LCG 12/17/2015

Table 5-2
Private Well Analytical Results for the Third Quarter 2015
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-M01L6C 9/29/2015	OC-M01L6D 9/29/2015	OC-M02L07 9/29/2015	OC-M03L02 9/29/2015	OC-M03L2D 9/29/2015	OC-M03L2F 9/29/2015	OC-M03L07 9/29/2015	OC-M14L2B 9/29/2015	OC-M15L2C 9/29/2015	OC-M24L116 9/29/2015	OC-M24L54 9/29/2015
SVOCs (mg/L)											
1,2,4,5-Tetrachlorobenzene			0.00095 U						0.00095 U		0.00095 U
1,2-Dichlorobenzene			0.00095 U						0.00095 U		0.00095 U
1-Methylnaphthalene			0.00019 U						0.00019 U		0.00019 U
2,2'-Dichlorodiisopropylether			0.00095 U						0.00095 U		0.00095 U
2,3,4,6-Tetrachlorophenol			0.0095 U						0.0095 U		0.0095 U
2,4,5-Trichlorophenol			0.0048 U						0.0048 U		0.0048 U
2,4,6-Trichlorophenol			0.0048 U						0.0048 U		0.0048 U
2,4-Dichlorophenol			0.0019 U						0.0019 U		0.0019 U
2,4-Dimethylphenol			0.0019 U						0.0019 U		0.0019 U
2,4-Dinitrophenol			0.0048 U						0.0048 U		0.0048 U
2,4-Dinitrotoluene			0.0048 U						0.0048 U		0.0048 U
2,6-Dinitrotoluene			0.0048 U						0.0048 U		0.0048 U
2-Chloronaphthalene			0.00095 U						0.00095 U		0.00095 U
2-Chlorophenol			0.00095 U						0.00095 U		0.00095 U
2-Methylnaphthalene			0.00019 U						0.00019 U		0.00019 U
2-Methylphenol			0.00095 U						0.00095 U		0.00095 U
2-Nitroaniline			0.0019 U						0.0019 U		0.0019 U
2-Nitrophenol			0.0019 U						0.0019 U		0.0019 U
3 & 4 Methylphenol			0.0019 U						0.0019 U		0.0019 U
3,3'-Dichlorobenzidine			0.0048 U						0.0048 U		0.0048 U
3-Nitroaniline			0.0019 U						0.0019 U		0.0019 U
4,6-Dinitro-2-methylphenol			0.0048 U						0.0048 U		0.0048 U
4-Bromophenyl phenyl ether			0.0019 U						0.0019 U		0.0019 U
4-Chloro-3-methylphenol			0.0019 U						0.0019 U		0.0019 U
4-Chloroaniline			0.0019 U						0.0019 U		0.0019 U
4-Chlorophenyl phenyl ether			0.0019 U						0.0019 U		0.0019 U
4-Nitroaniline			0.0019 U						0.0019 U		0.0019 U
4-Nitrophenol			0.0048 U						0.0048 U		0.0048 U
Acenaphthene			0.00019 U						0.00019 U		0.00019 U
Acenaphthylene			0.00019 U						0.00019 U		0.00019 U
Acetophenone			0.00095 U						0.00095 U		0.00095 U
Aniline			0.0048 U						0.0048 U		0.0048 U
Anthracene			0.00019 U						0.00019 U		0.00019 U
Atrazine			0.00095 U						0.00095 U		0.00095 U
Azobenzene			0.0095 U						0.0095 U		0.0095 U
Benzaldehyde			0.00095 U						0.00095 U		0.00095 U
Benzo(a)anthracene			0.00019 U						0.00019 U		0.00019 U
Benzo(a)pyrene			0.00019 U						0.00019 U		0.00019 U
Benzo(b)fluoranthene			0.00019 U						0.00019 U		0.00019 U
Benzo(ghi)perylene			0.00019 U						0.00019 U		0.00019 U
Benzo(k)fluoranthene			0.00019 U						0.00019 U		0.00019 U
Benzoic Acid			0.024 UJ						0.024 UJ		0.024 UJ
Benzyl alcohol			0.0048 U						0.0048 U		0.0048 U
Biphenyl			0.00095 U						0.00095 U		0.00095 U
Bis(2-Chloroethoxy)methane			0.00095 U						0.00095 U		0.00095 U
Bis(2-Chloroethyl)ether			0.00095 U						0.00095 U		0.00095 U

Table 5-2
Private Well Analytical Results for the Third Quarter 2015
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-M01L6C 9/29/2015	OC-M01L6D 9/29/2015	OC-M02L07 9/29/2015	OC-M03L02 9/29/2015	OC-M03L2D 9/29/2015	OC-M03L2F 9/29/2015	OC-M03L07 9/29/2015	OC-M14L2B 9/29/2015	OC-M15L2C 9/29/2015	OC-M24L116 9/29/2015	OC-M24L54 9/29/2015
Bis(2-Ethylhexyl)phthalate			0.0048 U						0.0048 U		0.0048 U
Butylbenzylphthalate			0.0019 U						0.0019 U		0.0019 U
Caprolactam			0.0048 U						0.0048 U		0.0048 U
Carbazole			0.00095 U						0.00095 U		0.00095 U
Chrysene			0.00019 U						0.00019 U		0.00019 U
Di-n-butylphthalate			0.0048 U						0.0048 U		0.0048 U
Di-n-octylphthalate			0.0019 U						0.0019 U		0.0019 U
Dibenz(a,h)anthracene			0.00019 U						0.00019 U		0.00019 U
Dibenzofuran			0.00095 U						0.00095 U		0.00095 U
Diethylphthalate			0.0019 U						0.0019 U		0.0019 U
Dimethylphthalate			0.0019 U						0.0019 U		0.0019 U
Diphenyl ether			0.0095 U						0.0095 U		0.0095 U
Diphenylmethanone			0.0048 U						0.0048 U		0.0048 U
Fluoranthene			0.00019 U						0.00019 U		0.00019 U
Fluorene			0.00019 U						0.00019 U		0.00019 U
Hexachlorobenzene			0.00019 U						0.00019 U		0.00019 U
Hexachlorocyclopentadiene			0.0095 U						0.0095 U		0.0095 U
Hexachloroethane			0.00095 U						0.00095 U		0.00095 U
Indeno(1,2,3-cd)pyrene			0.00019 U						0.00019 U		0.00019 U
Isophorone			0.00095 U						0.00095 U		0.00095 U
N-Nitrosodi-n-propylamine			0.00095 U						0.00095 U		0.00095 U
N-Nitrosodiphenylamine			0.00095 U						0.00095 U		0.00095 U
Nitrobenzene			0.00095 U						0.00095 U		0.00095 U
Pentachlorophenol			0.0048 U						0.0048 U		0.0048 U
Phenanthrene			0.00019 U						0.00019 U		0.00019 U
Phenol			0.00095 U						0.00095 U		0.00095 U
Pyrene			0.00019 U						0.00019 U		0.00019 U
NDMA/NDPA (ng/L)											
N-Nitrosodimethylamine	1.6 J	3.1	1.9 U	0.98 J	3	1.9 U	1.9 U	1.9 U	1.9 U	1.8 J	12
N-Nitrosodi-n-propylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Metals, Total (mg/L)											
Chromium			0.0013 J					0.00076 J	0.0011 J		0.00063 J
Chromium, Hexavalent			0.005 U					0.005 U	0.005 U		0.005 U
Sodium			8.6					24	22		31
Inorganics (mg/L)											
Chloride			25					15	120		81
Nitrate as N			7.7					0.05 U	0.024 J		0.026 J
Nitrite as N			0.11 J					0.05 U	0.05 U		0.05 U
Nitrogen, as Ammonia			0.25 U					0.25 U	0.25 U		0.25 U
Sulfate			16					55	28		24

Notes:
mg/L - milligram per liter
ng/L - nanograms per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Table 5-2
Private Well Analytical Results for the Third Quarter 2015
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-M24L63 9/29/2015	OC-M24L64 9/30/2015	OC-M24L65 9/30/2015	OC-M24L66 9/29/2015	OC-M24L72A 9/29/2015	OC-M24L94 9/29/2015	OC-M27L14C 9/29/2015
SVOCs (mg/L)							
1,2,4,5-Tetrachlorobenzene	0.00095 U	0.00095 U				0.00095 U	0.00095 U
1,2-Dichlorobenzene	0.00095 U	0.00095 U				0.00095 U	0.00095 U
1-Methylnaphthalene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
2,2'-Dichlorodiisopropylether	0.00095 U	0.00095 U				0.00095 U	0.00095 U
2,3,4,6-Tetrachlorophenol	0.0095 U	0.0095 U				0.0095 U	0.0095 U
2,4,5-Trichlorophenol	0.0048 U	0.0048 U				0.0048 U	0.0048 U
2,4,6-Trichlorophenol	0.0048 U	0.0048 U				0.0048 U	0.0048 U
2,4-Dichlorophenol	0.0019 U	0.0019 U				0.0019 U	0.0019 U
2,4-Dimethylphenol	0.0019 U	0.0019 U				0.0019 U	0.0019 U
2,4-Dinitrophenol	0.0048 U	0.0048 U				0.0048 U	0.0048 U
2,4-Dinitrotoluene	0.0048 U	0.0048 U				0.0048 U	0.0048 U
2,6-Dinitrotoluene	0.0048 U	0.0048 U				0.0048 U	0.0048 U
2-Chloronaphthalene	0.00095 U	0.00095 U				0.00095 U	0.00095 U
2-Chlorophenol	0.00095 U	0.00095 U				0.00095 U	0.00095 U
2-Methylnaphthalene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
2-Methylphenol	0.00095 U	0.00095 U				0.00095 U	0.00095 U
2-Nitroaniline	0.0019 U	0.0019 U				0.0019 U	0.0019 U
2-Nitrophenol	0.0019 U	0.0019 U				0.0019 U	0.0019 U
3 & 4 Methylphenol	0.0019 U	0.0019 U				0.0019 U	0.0019 U
3,3'-Dichlorobenzidine	0.0048 U	0.0048 U				0.0048 U	0.0048 U
3-Nitroaniline	0.0019 U	0.0019 U				0.0019 U	0.0019 U
4,6-Dinitro-2-methylphenol	0.0048 U	0.0048 U				0.0048 U	0.0048 U
4-Bromophenyl phenyl ether	0.0019 U	0.0019 U				0.0019 U	0.0019 U
4-Chloro-3-methylphenol	0.0019 U	0.0019 U				0.0019 U	0.0019 U
4-Chloroaniline	0.0019 U	0.0019 U				0.0019 U	0.0019 U
4-Chlorophenyl phenyl ether	0.0019 U	0.0019 U				0.0019 U	0.0019 U
4-Nitroaniline	0.0019 U	0.0019 U				0.0019 U	0.0019 U
4-Nitrophenol	0.0048 U	0.0048 U				0.0048 U	0.0048 U
Acenaphthene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Acenaphthylene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Acetophenone	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Aniline	0.0048 U	0.0048 U				0.0048 U	0.0048 U
Anthracene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Atrazine	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Azobenzene	0.0095 U	0.0095 U				0.0095 U	0.0095 U
Benzaldehyde	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Benzo(a)anthracene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Benzo(a)pyrene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Benzo(b)fluoranthene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Benzo(ghi)perylene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Benzo(k)fluoranthene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Benzoic Acid	0.024 UJ	0.024 UJ				0.024 UJ	0.024 UJ
Benzyl alcohol	0.0048 U	0.0048 U				0.0048 U	0.0048 U
Biphenyl	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Bis(2-Chloroethoxy)methane	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Bis(2-Chloroethyl)ether	0.00095 U	0.00095 U				0.00095 U	0.00095 U

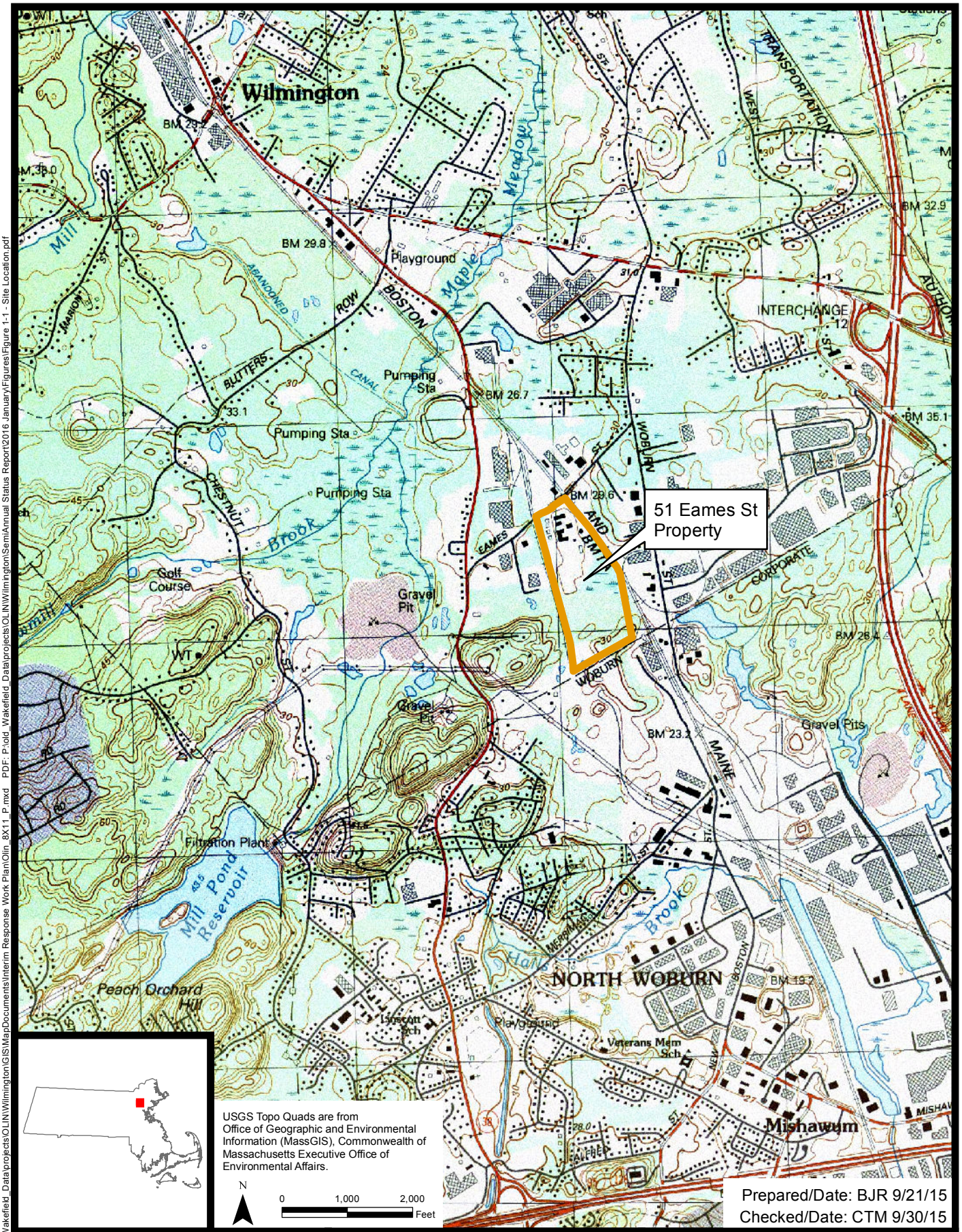
Table 5-2
Private Well Analytical Results for the Third Quarter 2015
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-M24L63 9/29/2015	OC-M24L64 9/30/2015	OC-M24L65 9/30/2015	OC-M24L66 9/29/2015	OC-M24L72A 9/29/2015	OC-M24L94 9/29/2015	OC-M27L14C 9/29/2015
Bis(2-Ethylhexyl)phthalate	0.0048 U	0.0048 U				0.0048 U	0.0048 U
Butylbenzylphthalate	0.0019 U	0.0019 U				0.0019 U	0.0019 U
Caprolactam	0.0048 U	0.0048 U				0.0048 U	0.0048 U
Carbazole	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Chrysene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Di-n-butylphthalate	0.0048 U	0.0048 U				0.0048 U	0.0048 U
Di-n-octylphthalate	0.0019 U	0.0019 U				0.0019 U	0.0019 U
Dibenz(a,h)anthracene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Dibenzofuran	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Diethylphthalate	0.0019 U	0.0019 U				0.0019 U	0.0019 U
Dimethylphthalate	0.0019 U	0.0019 U				0.0019 U	0.0019 U
Diphenyl ether	0.0095 U	0.0095 U				0.0095 U	0.0095 U
Diphenylmethanone	0.0048 U	0.0048 U				0.0048 U	0.0048 U
Fluoranthene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Fluorene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Hexachlorobenzene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Hexachlorocyclopentadiene	0.0095 U	0.0095 U				0.0095 U	0.0095 U
Hexachloroethane	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Indeno(1,2,3-cd)pyrene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Isophorone	0.00095 U	0.00095 U				0.00095 U	0.00095 U
N-Nitrosodi-n-propylamine	0.00095 U	0.00095 U				0.00095 U	0.00095 U
N-Nitrosodiphenylamine	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Nitrobenzene	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Pentachlorophenol	0.0048 U	0.0048 U				0.0048 U	0.0048 U
Phenanthrene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
Phenol	0.00095 U	0.00095 U				0.00095 U	0.00095 U
Pyrene	0.00019 U	0.00019 U				0.00019 U	0.00019 U
NDMA/NDPA (ng/L)							
N-Nitrosodimethylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.4 J	1.9 U
N-Nitrosodi-n-propylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Metals, Total (mg/L)							
Chromium	0.0016 J	0.0013 J	0.0015 J	0.0013 J	0.001 J	0.0011 J	0.0011 J
Chromium, Hexavalent	0.005 U	0.005 U				0.005 U	0.005 U
Sodium	22	23	18	28	21	54	33
Inorganics (mg/L)							
Chloride	140	130	100	150	120	140	130
Nitrate as N	0.53	0.47	0.55	0.32	0.49	0.65	0.064
Nitrite as N	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Nitrogen, as Ammonia	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Sulfate	19	15	18	17	18	22	36

Notes:
mg/L - milligram per liter
ng/L - nanograms per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Prepared by: KMS 12/2/2015
Checked by: LCG 12/17/2015

FIGURES



Prepared/Date: BJR 9/21/15
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Olin Chemical Superfund Site
Wilmington, Massachusetts

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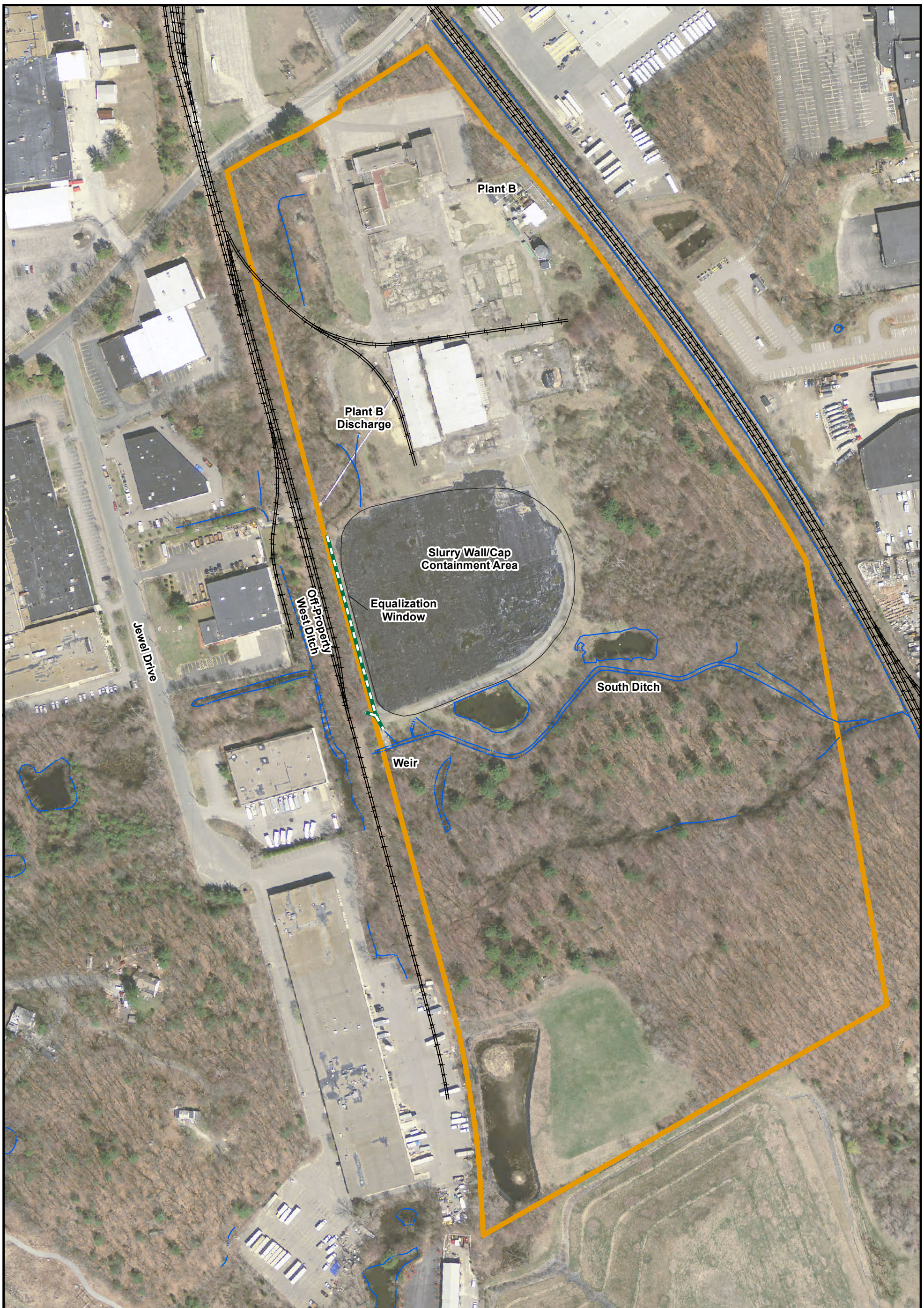
Figure 1-1
Site Location
Semi-Annual Status Report No. 17



Legend

- Railroad
- Water
- Culvert
- Site Boundary

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N

0 100 200 400 Feet

Figure 1-2
Site Plan

Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
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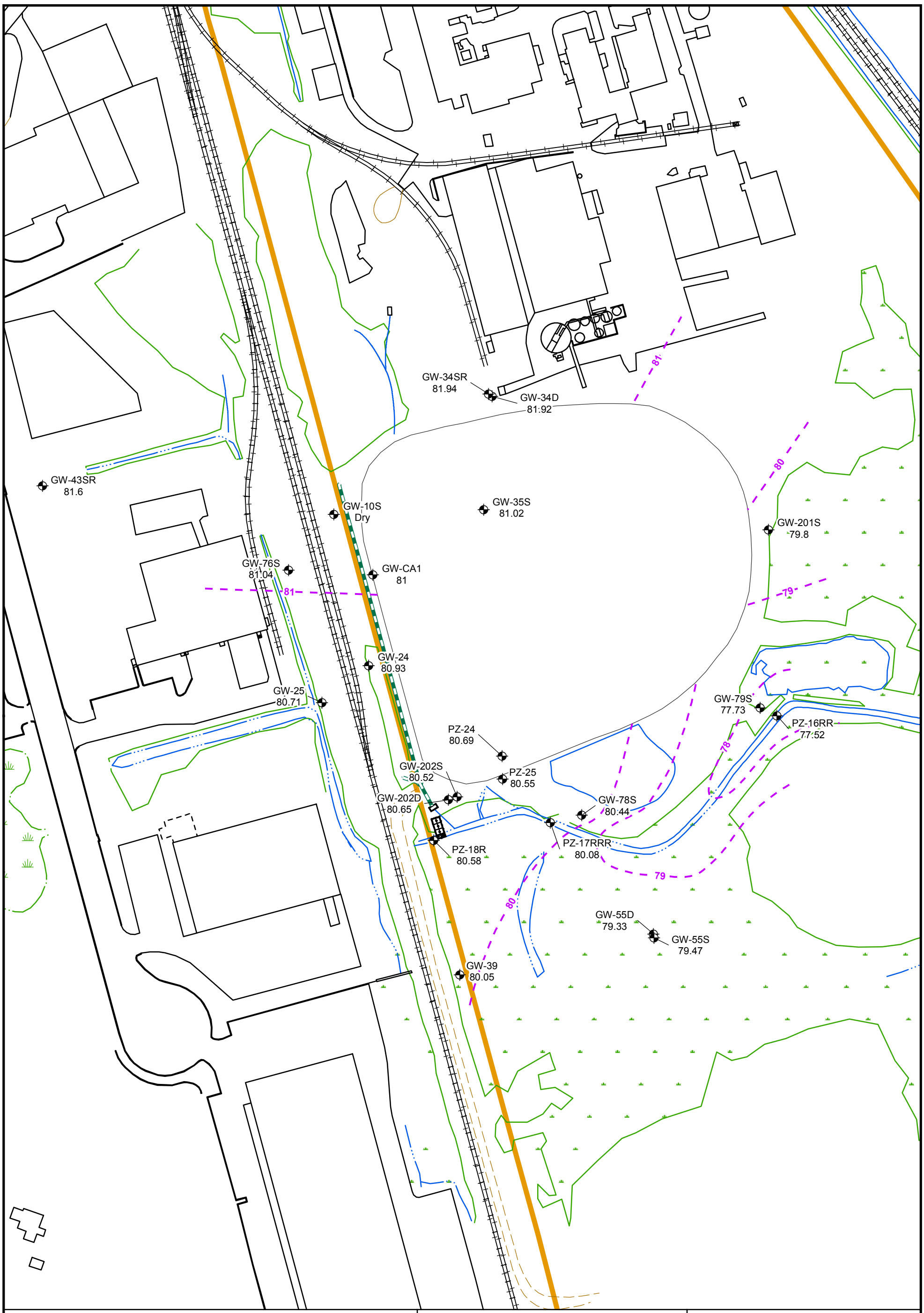

Legend

- Monitoring Well Location
- Interpreted Groundwater Contour
- Site Boundary
- Wetland Boundary
- Paved Road
- Unpaved Road
- Railroad
- Structure
- Water
- Culvert
- Trail

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N

0 60 120 240 Feet

Figure 2-1
Slurry Wall / Cap Interpreted Water Level Contours - Second Quarter 2015

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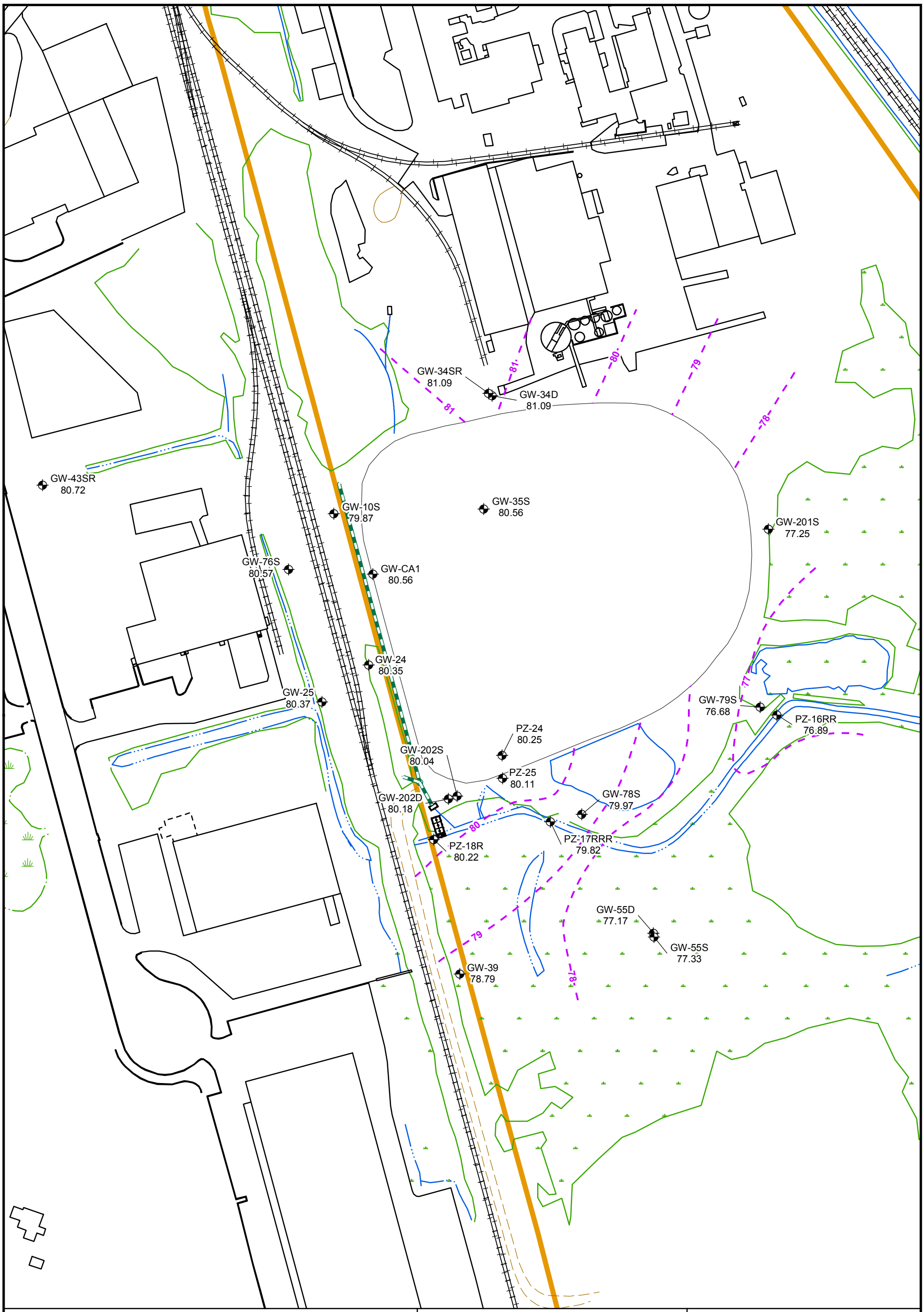
Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_IRWP2.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Figures\Figure 2-1 - Slurry Wall Cap Interpreted Water Level Contours - Second Quarter 2015.pdf



Legend

- Monitoring Well Location
- Interpreted Groundwater Contour
- Site Boundary
- Wetland Boundary
- Paved Road
- Unpaved Road
- Railroad
- Structure
- Water
- Culvert
- Trail

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N

0 60 120 240 Feet

Figure 2-2
Slurry Wall / Cap Interpreted Water Level Contours - Third Quarter 2015

Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 11/23/15 | Checked/Date: LCG 12/21/15

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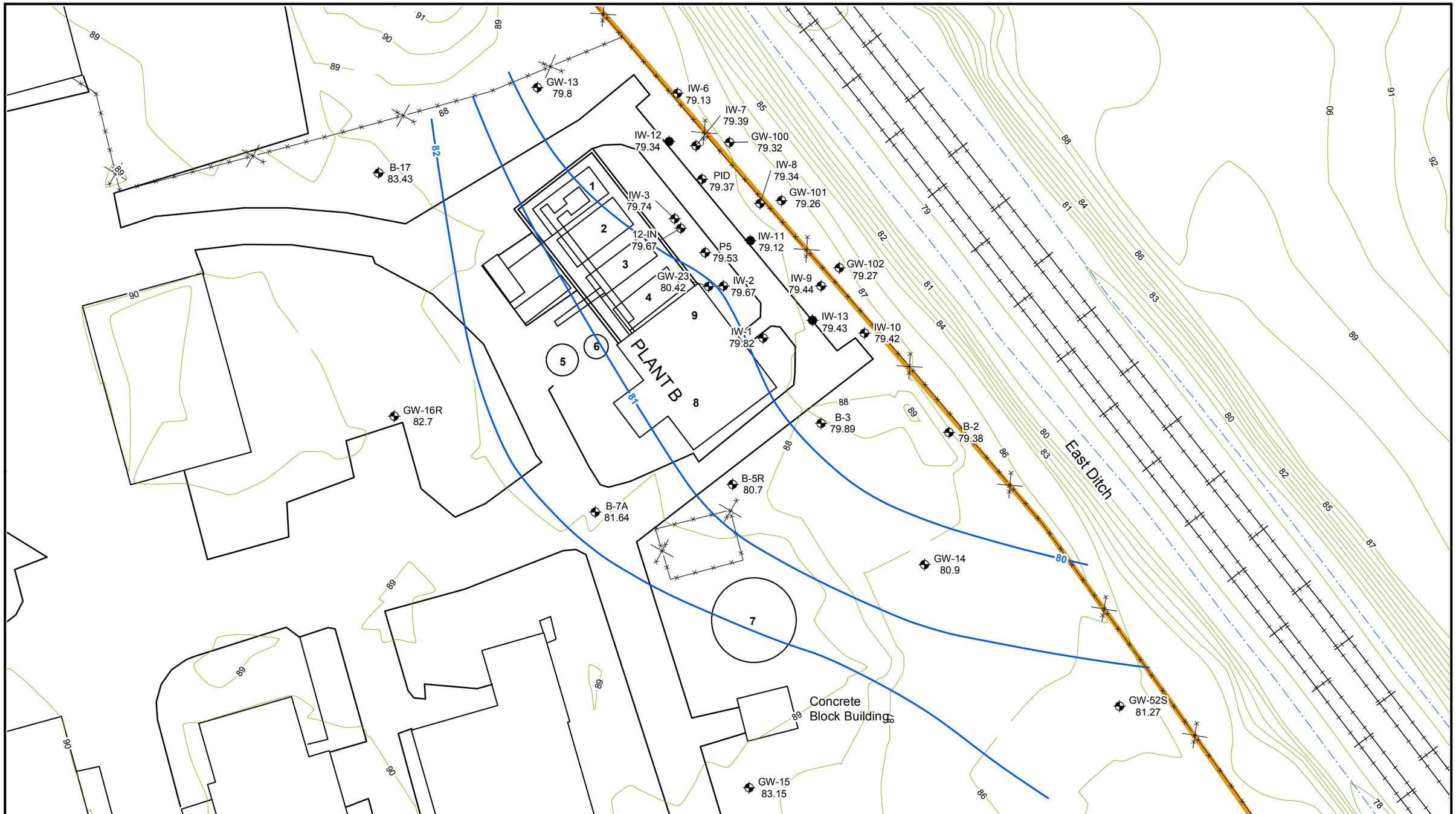

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

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N

0 15 30 60 Feet

Figure 3-1
Plant B Interpreted Water Level Conditions - April 30, 2015

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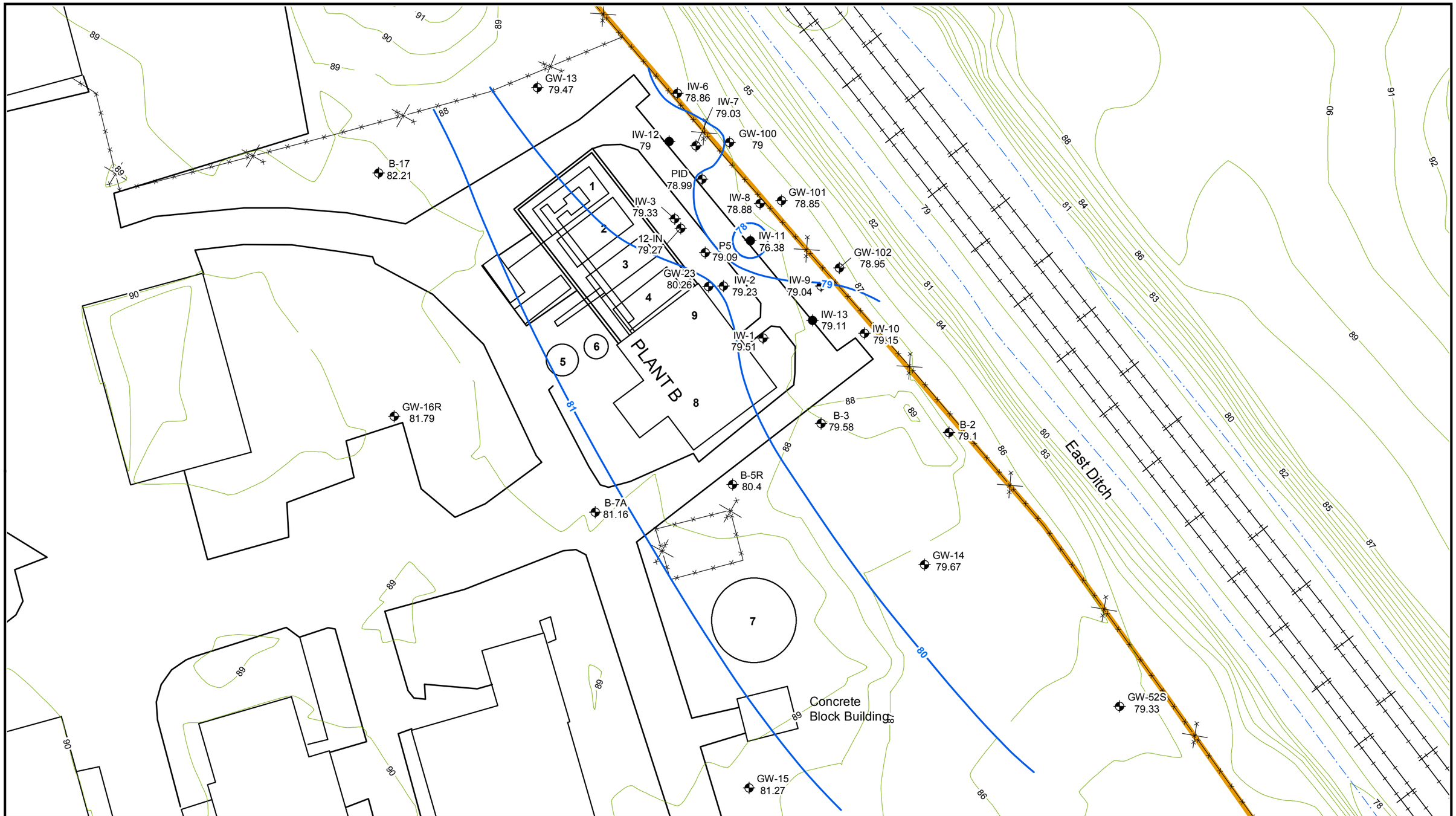

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Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

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N

0 15 30 60 Feet

Figure 3-2
Plant B Interpreted Water Level Conditions - May 27, 2015

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Prepared/Date: BJR 12/11/15 | Checked/Date: LCG 12/18/15

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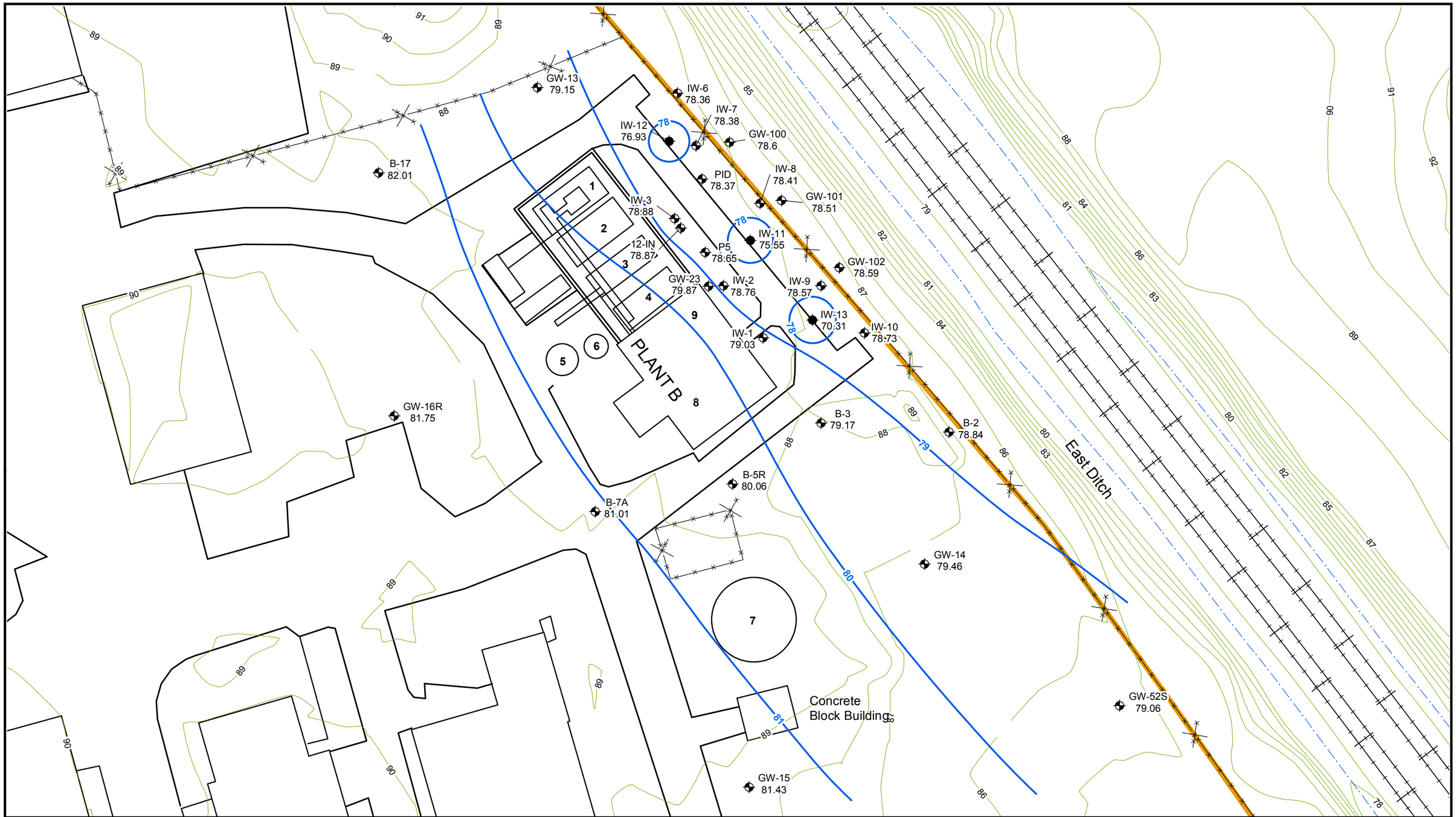

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

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N

0 15 30 60 Feet

Figure 3-3
Plant B Interpreted Water Level Conditions - June 30, 2015

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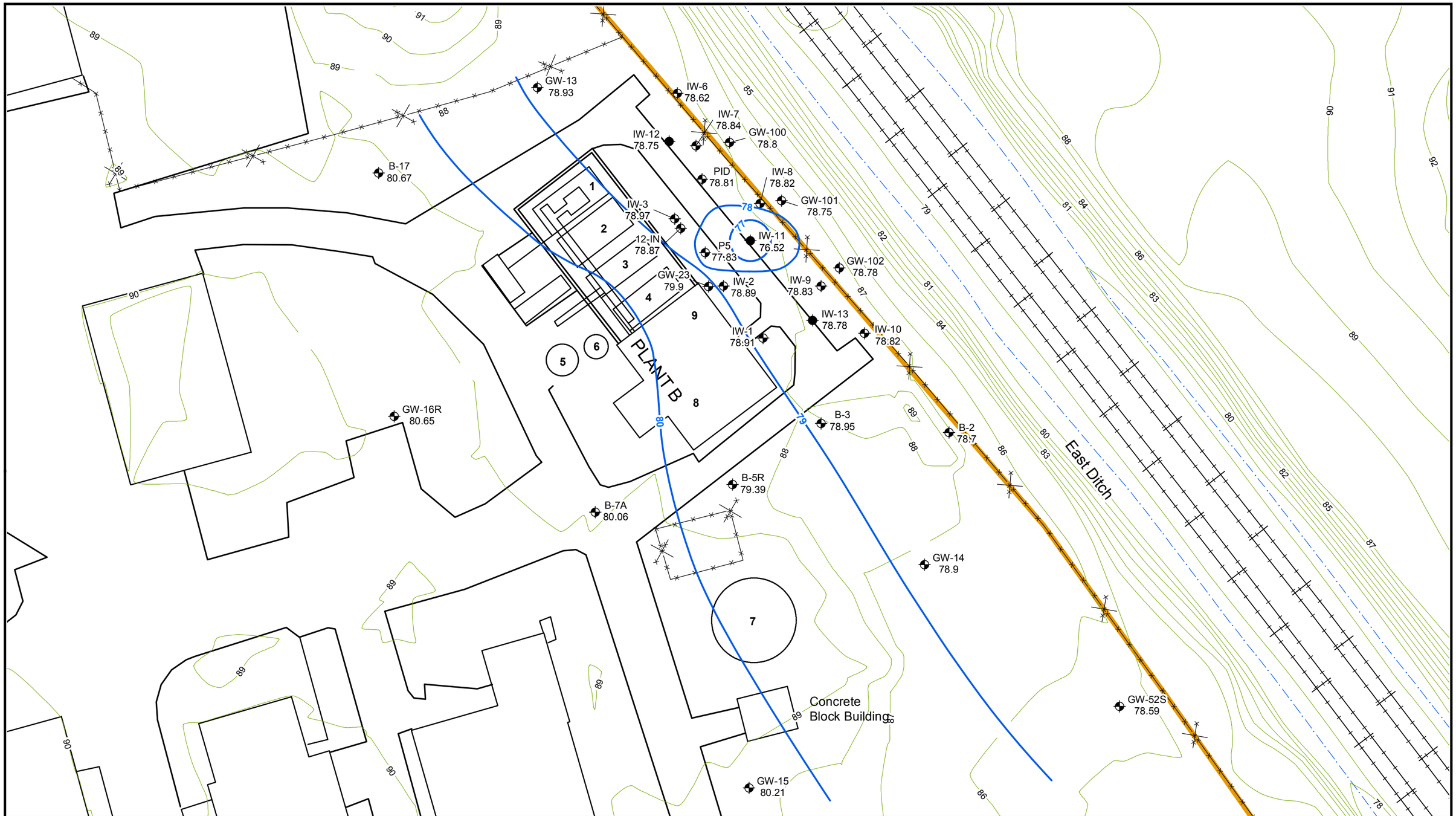

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

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N

0 15 30 60 Feet

Figure 3-4
Plant B Interpreted Water Level Conditions - July 31, 2015

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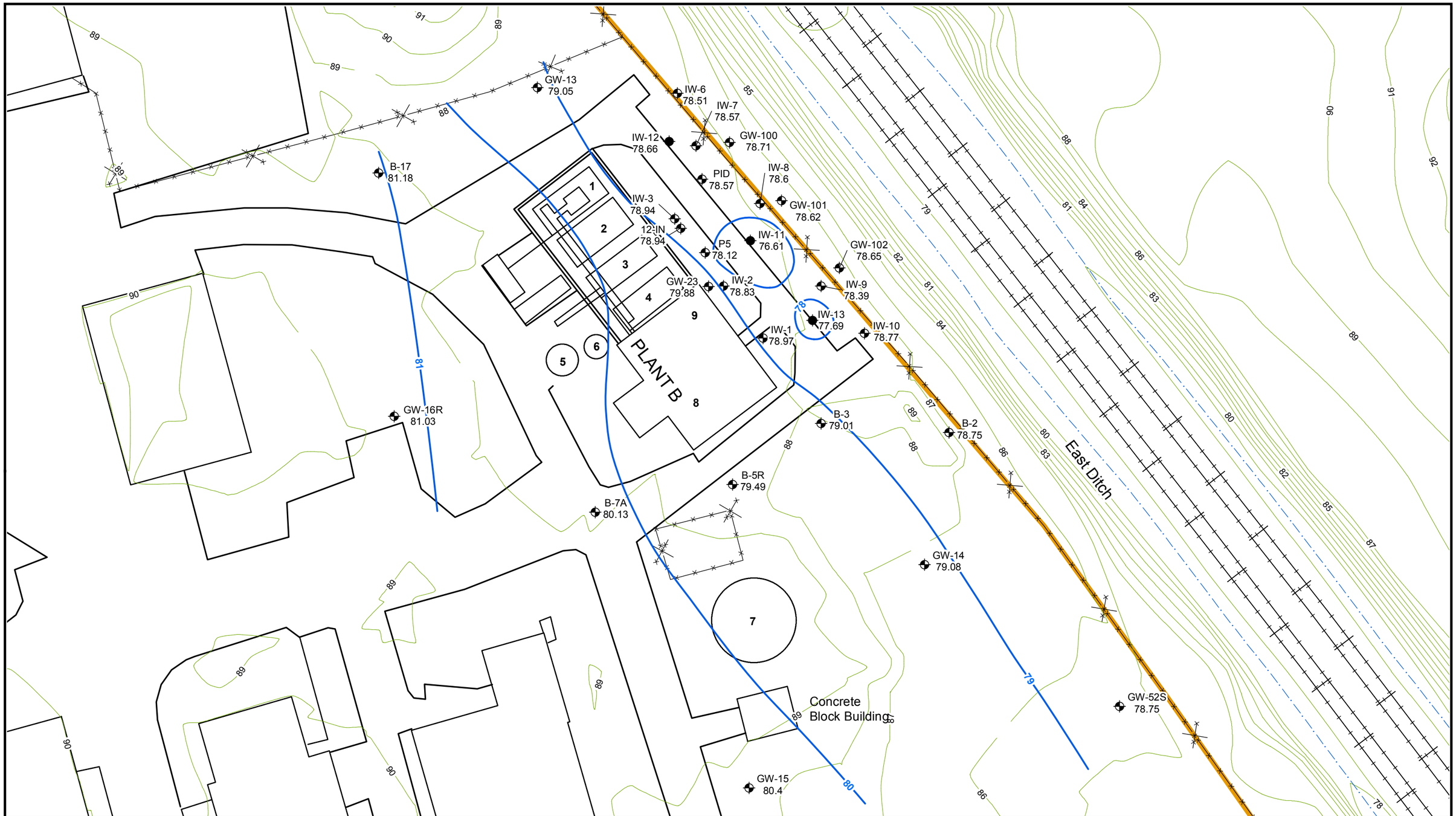

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

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N

0 15 30 60 Feet

Figure 3-5
Plant B Interpreted Water Level Conditions - August 31, 2015

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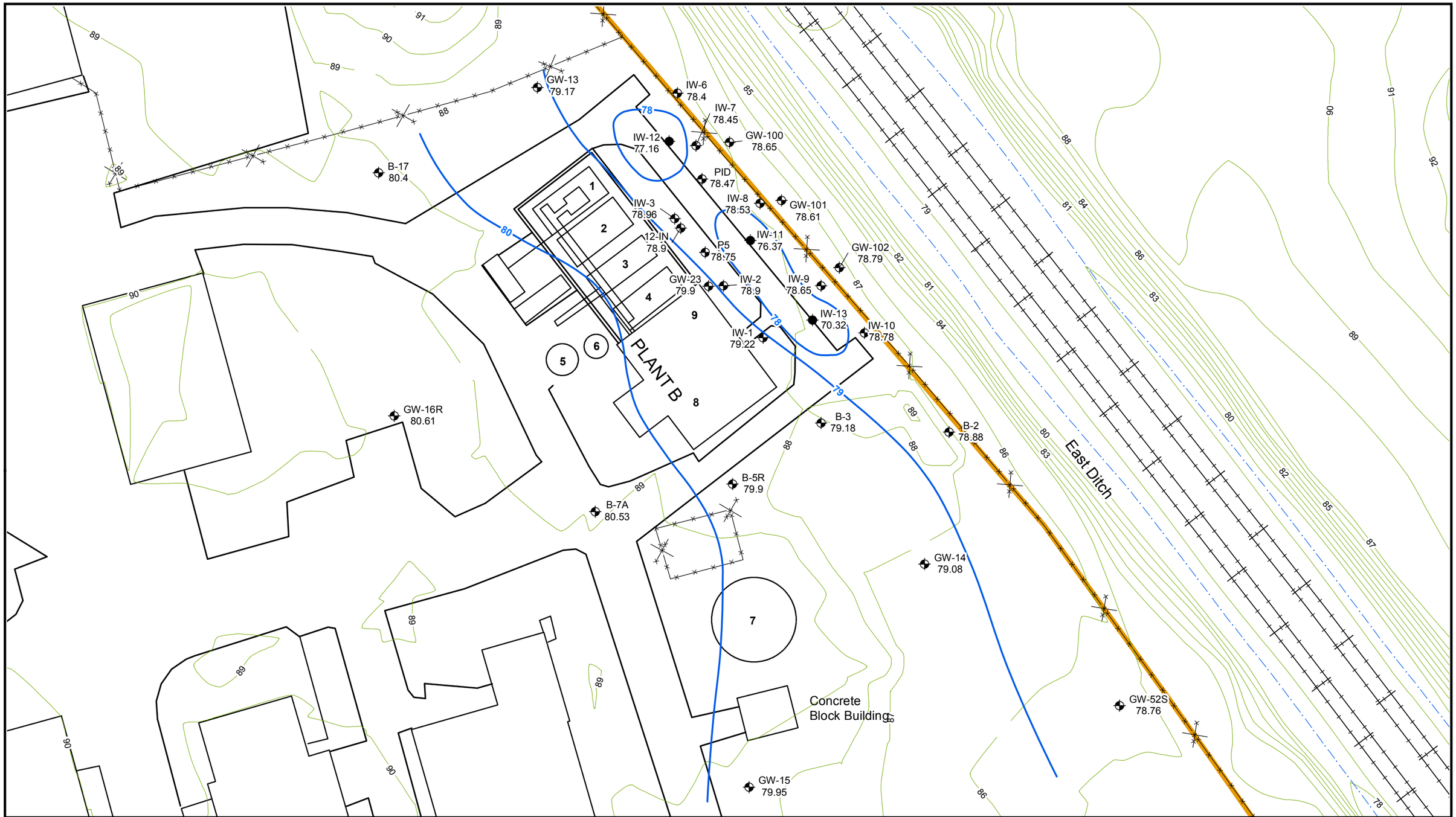

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

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N

0 15 30 60 Feet

Figure 3-6
Plant B Interpreted Water Level Conditions - September 30, 2015

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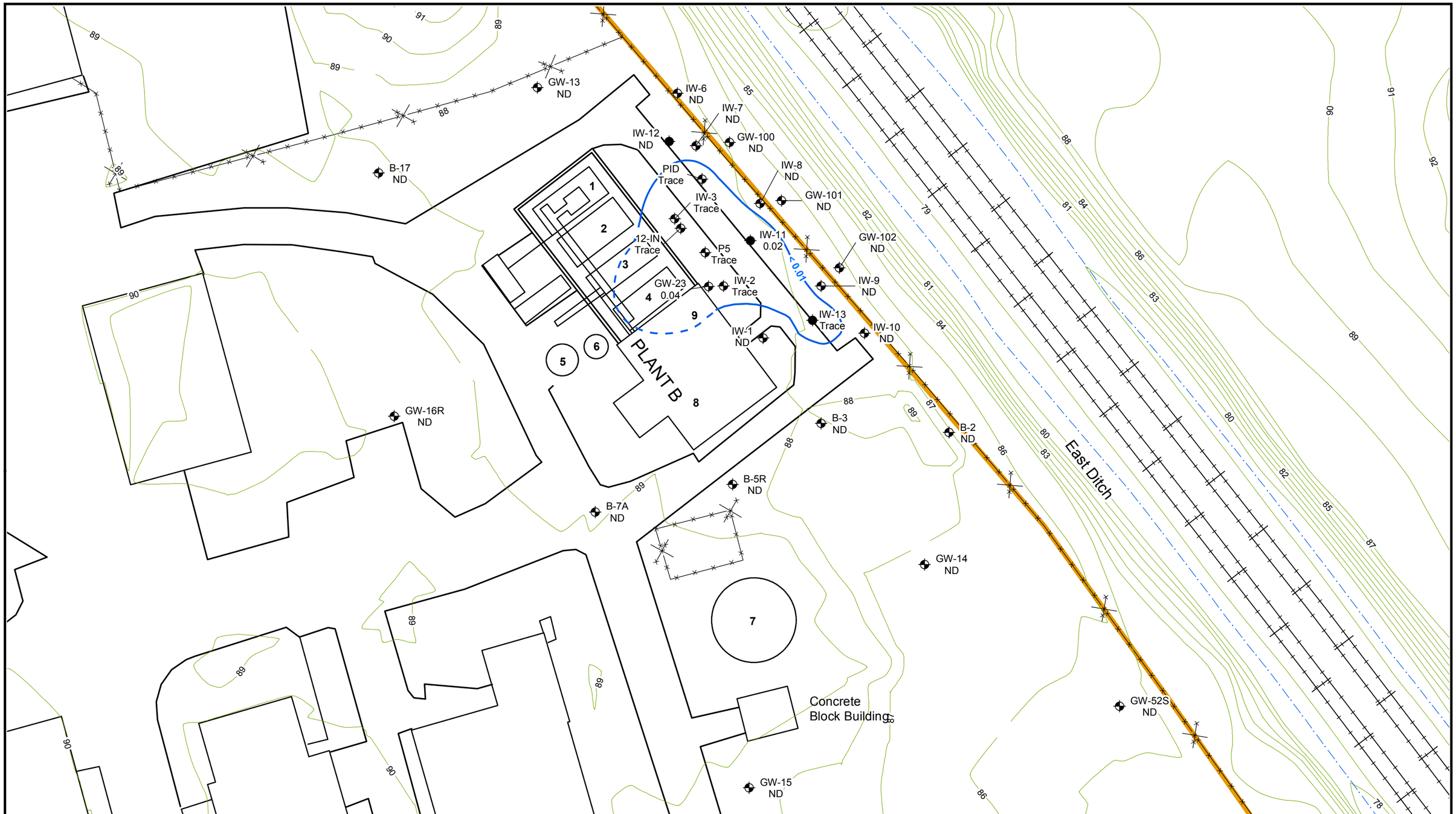

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
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Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N
0 15 30 60 Feet

Figure 3-7
Plant B Interpreted LNAPL Thickness Contours - April 30 2015

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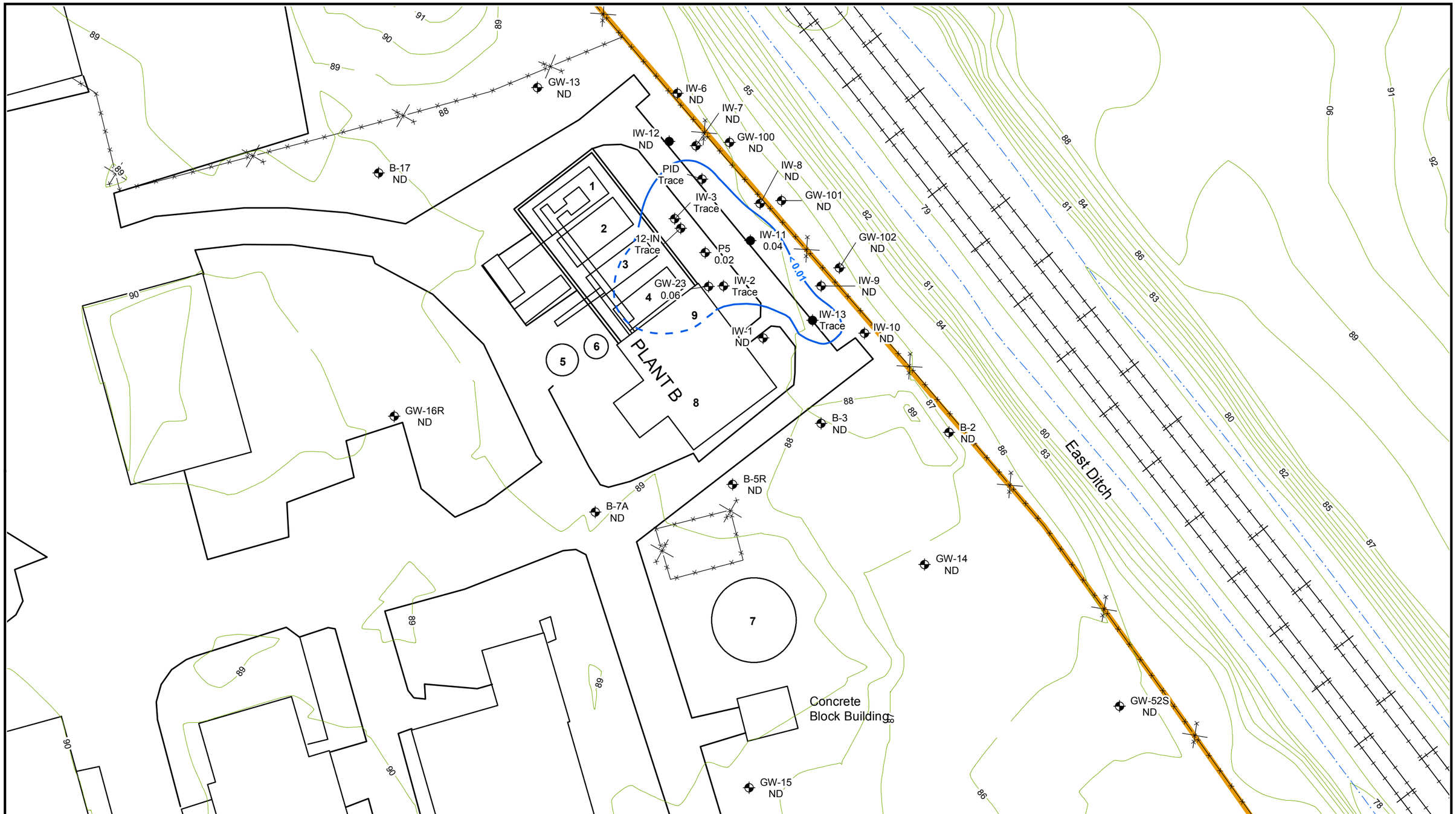

Tank #1 - Receives gravity overflow from Tank 2
and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N

0 15 30 60 Feet

Figure 3-8
Plant B Interpreted LNAPL Thickness Contours - May 27 2015

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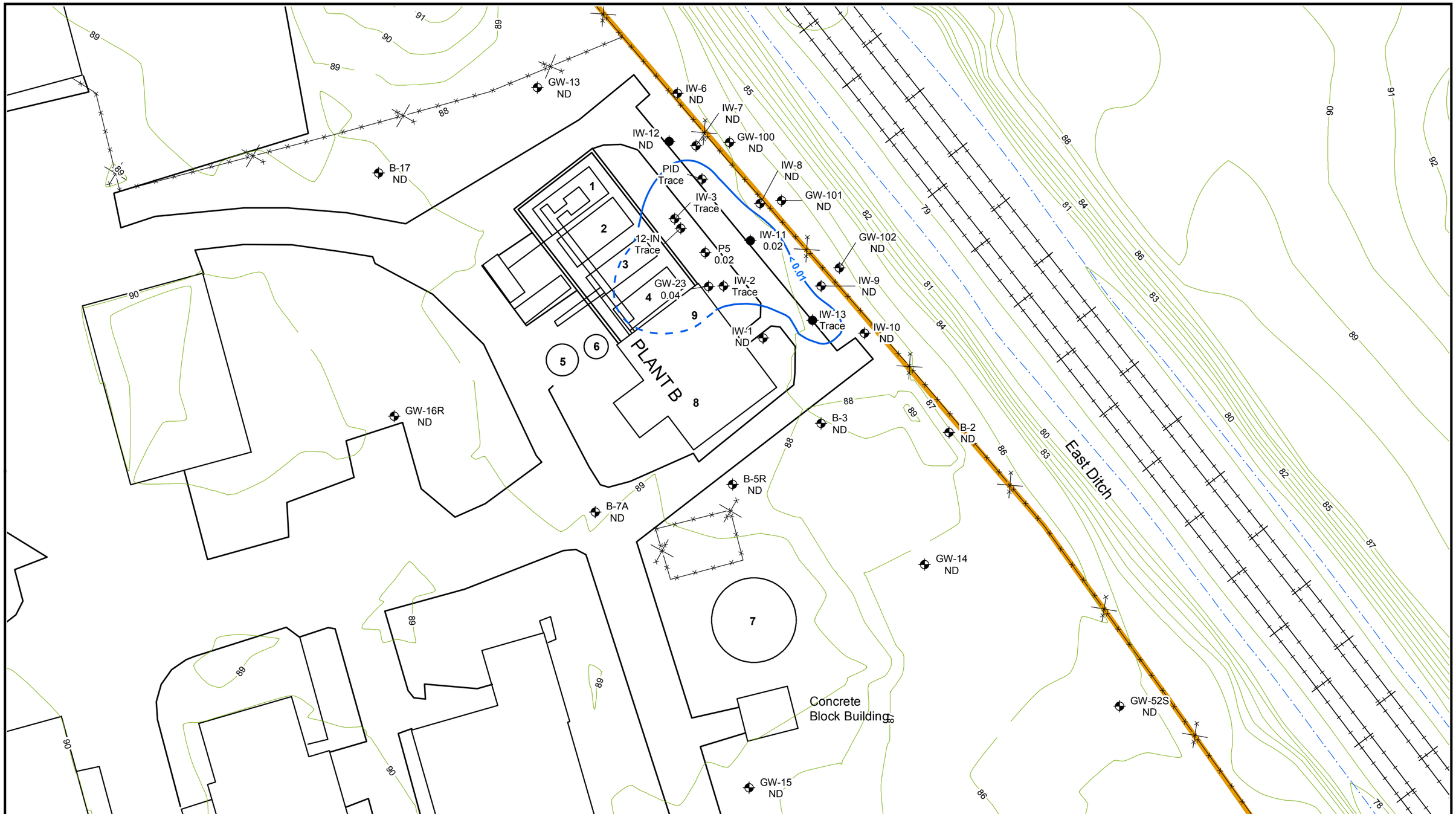

Tank #1 - Receives gravity overflow from Tank 2
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Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N

0 15 30 60 Feet

Figure 3-9
Plant B Interpreted LNAPL Thickness Contours - June 30 2015

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Olin Chemical Superfund Site
Wilmington, Massachusetts

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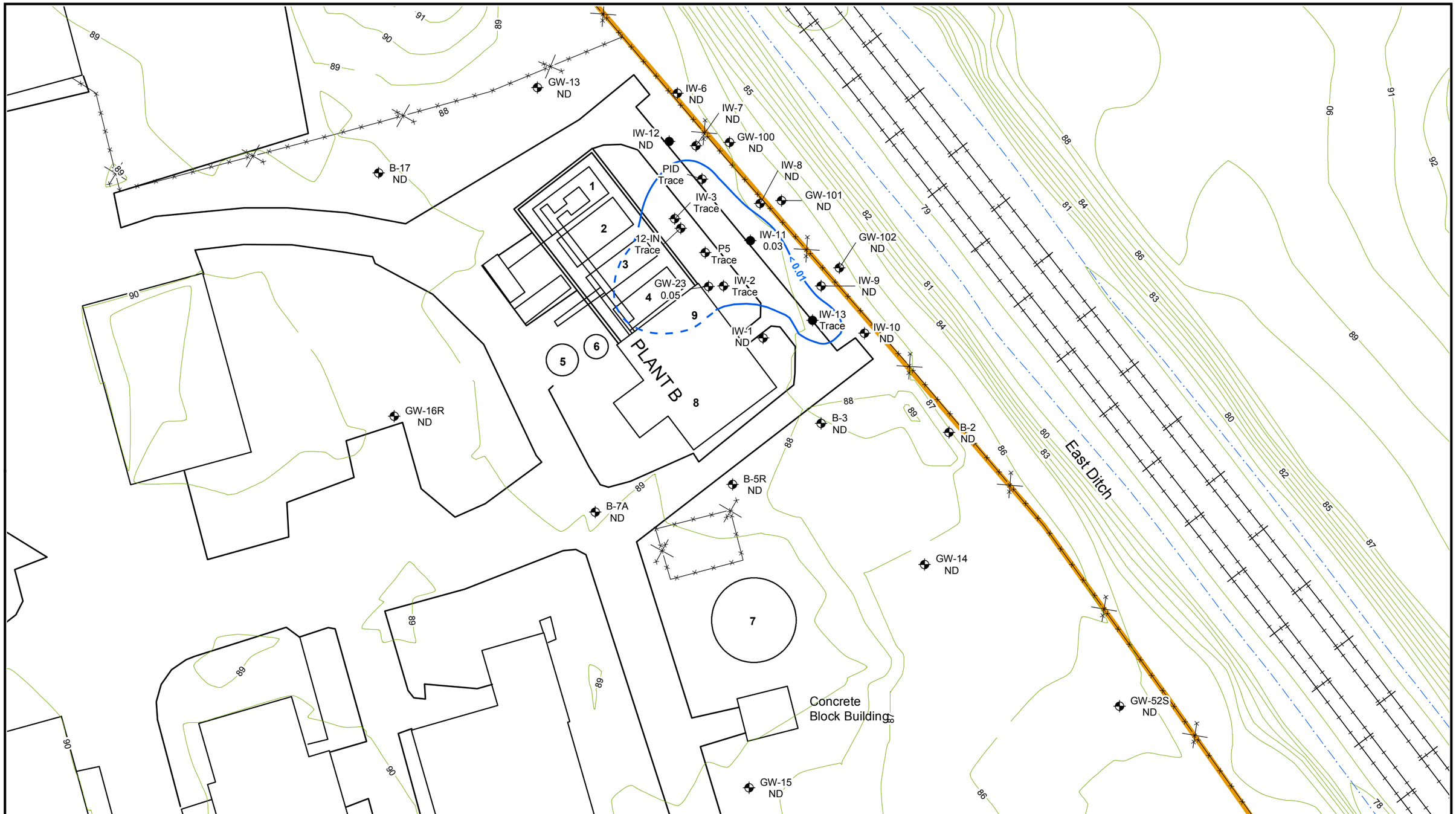

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N
0 15 30 60 Feet

Figure 3-10
Plant B Interpreted LNAPL Thickness Contours - July 31 2015

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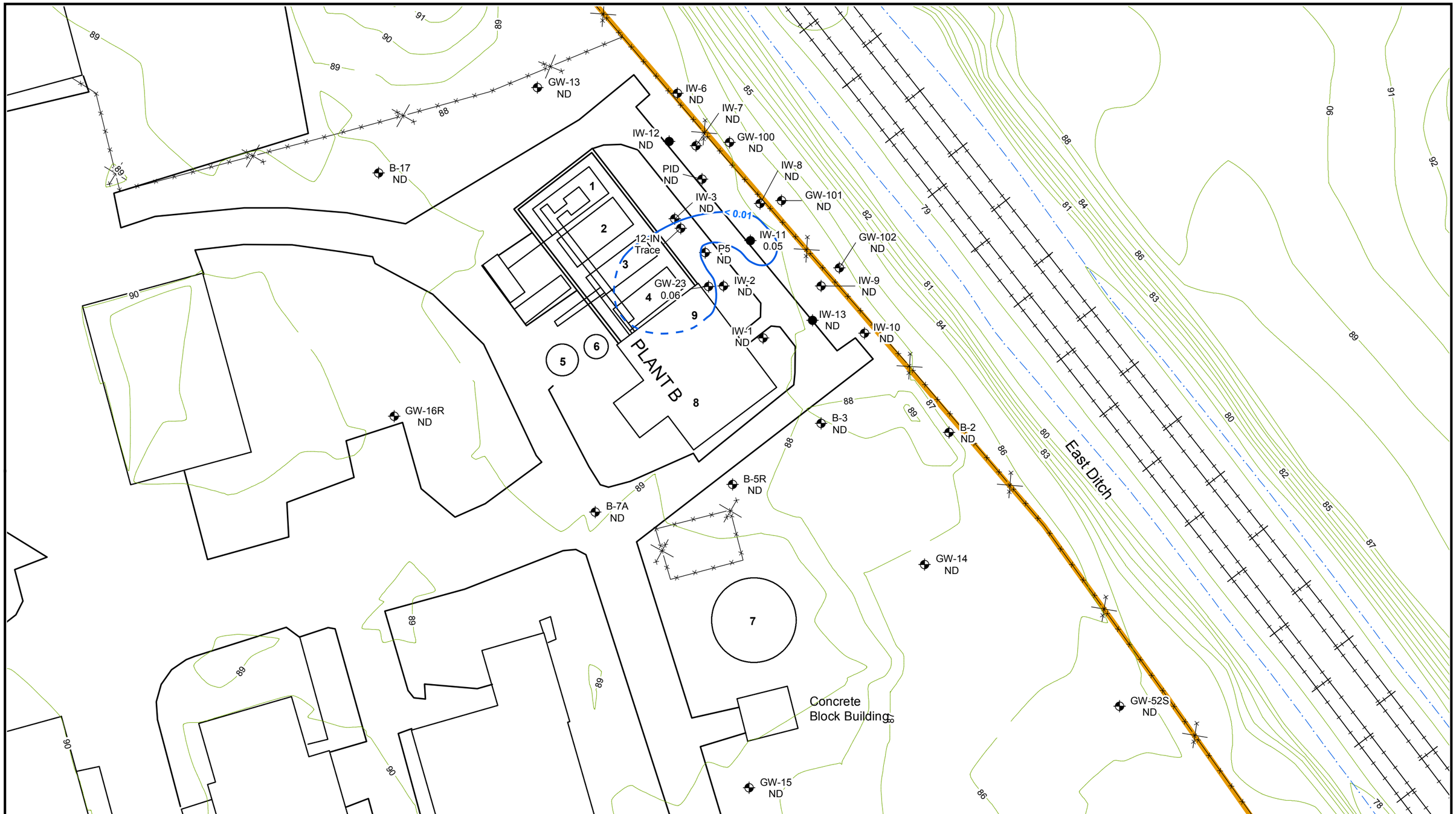

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Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N
0 15 30 60 Feet

Figure 3-11
Plant B Interpreted LNAPL Thickness Contour - August 31 2015

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Wilmington, Massachusetts

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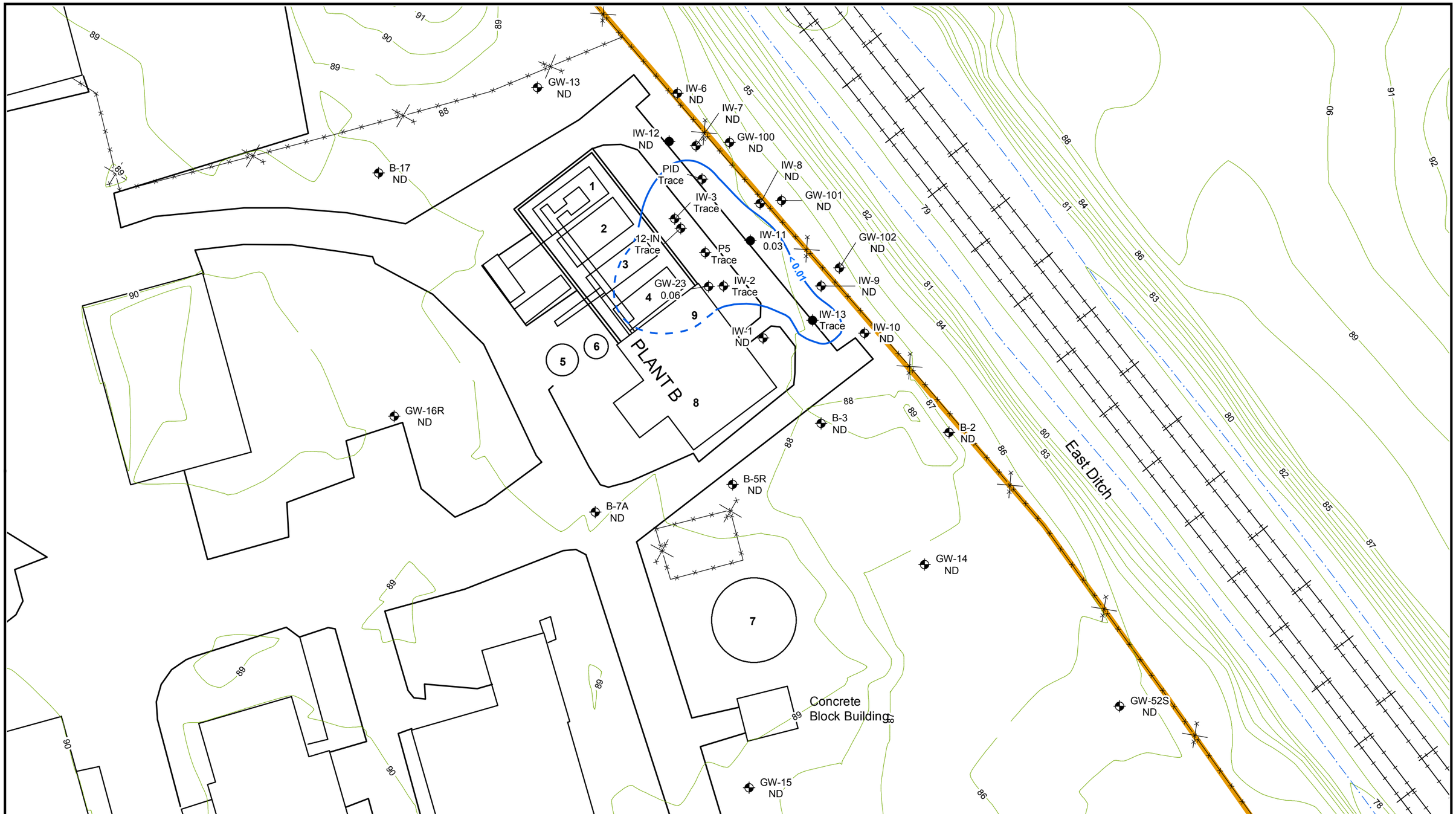

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Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N
0 15 30 60 Feet

Figure 3-12
Plant B Interpreted LNAPL Thickness Contour - September 30 2015

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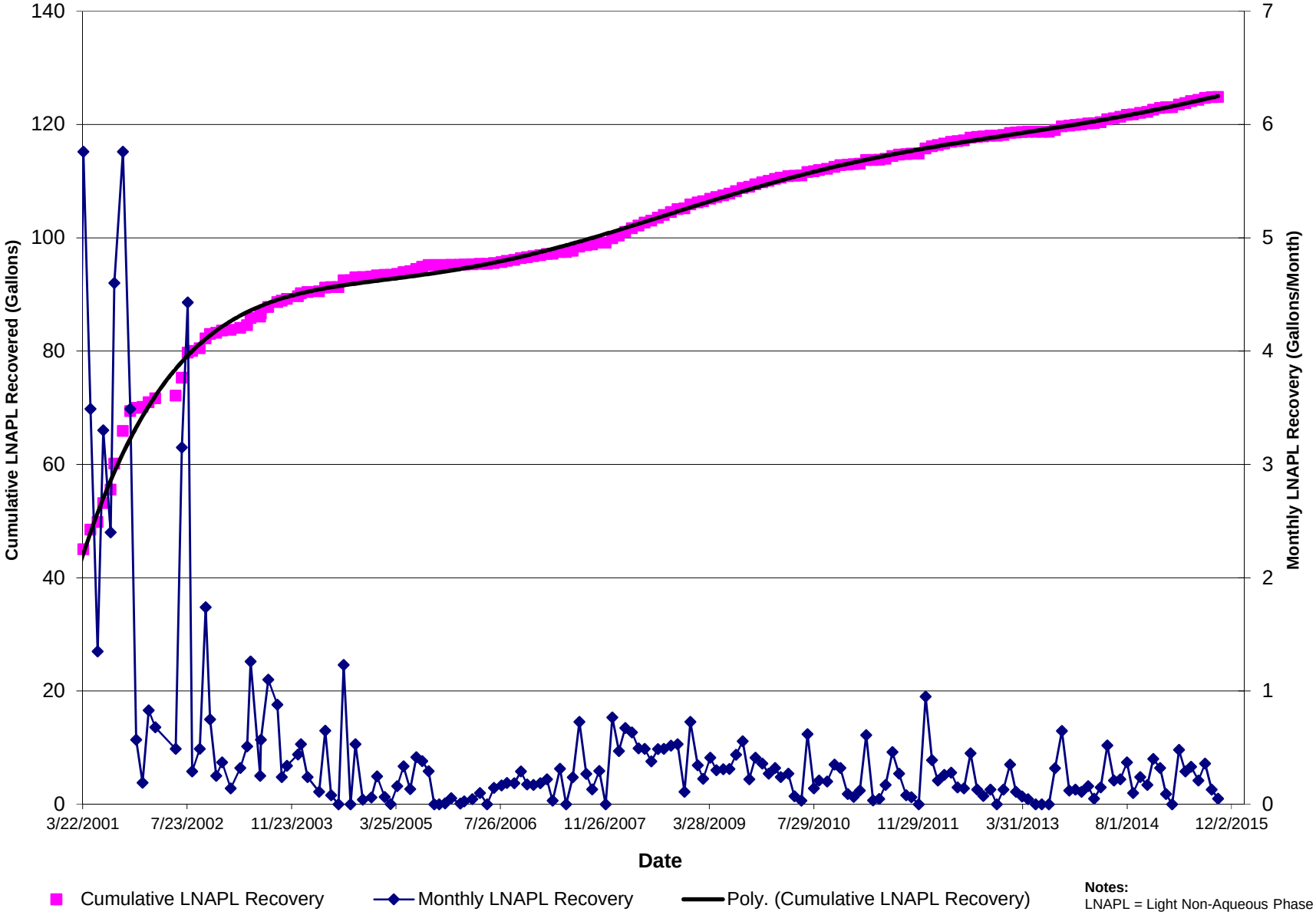
Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_PlantB_SASR_16_17.mxd P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Figures\Figure 3-12 - Plant B Interpreted LNAPL Thickness Contours September 30 2015.pdf

Figure 3-13
Monthly and Cumulative LNAPL Recovery
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

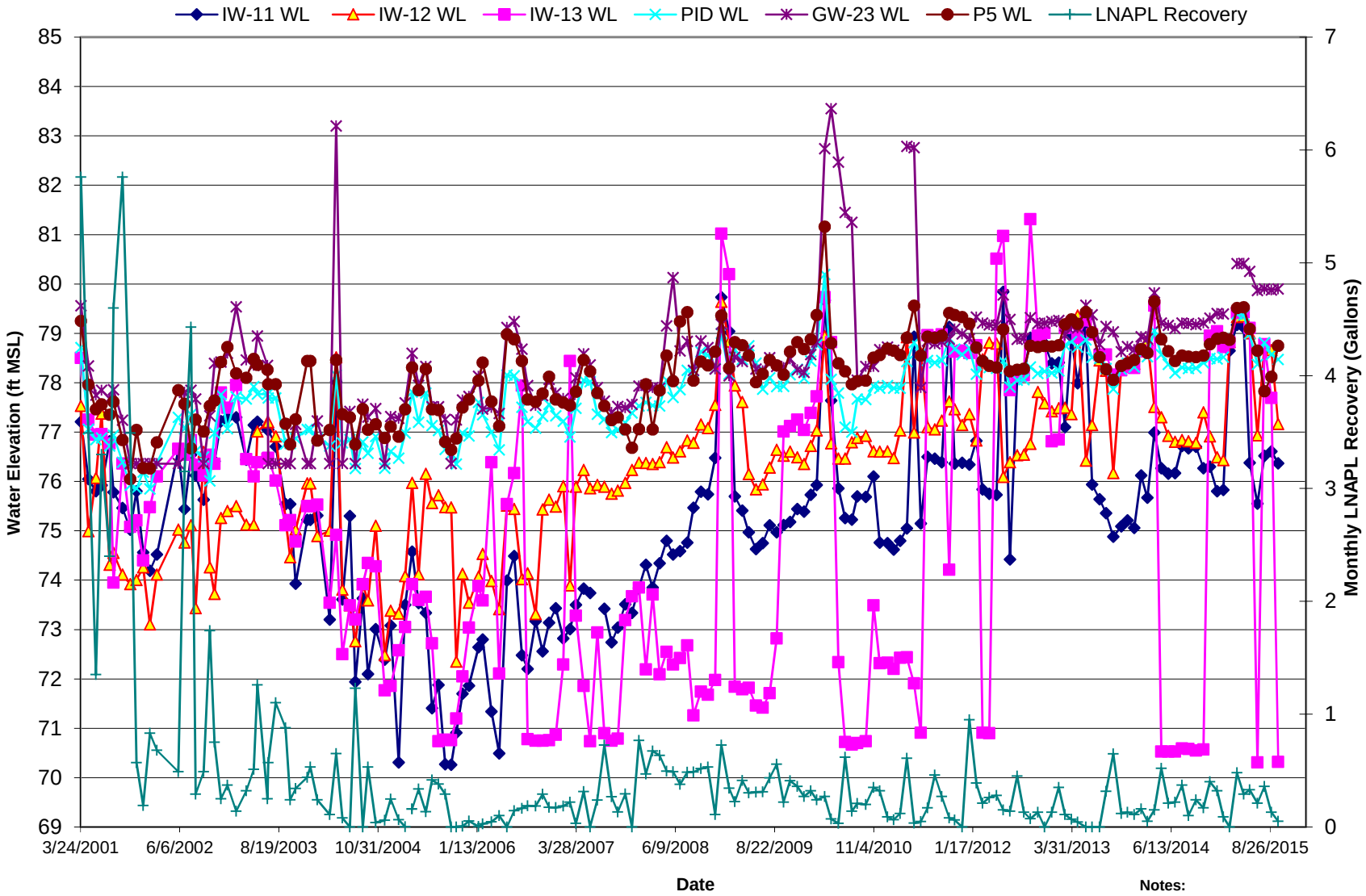


Notes:
LNAPL = Light Non-Aqueous Phase Liquid

P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Figures\
Monthy and Cumulative LNAPL Recovery Data Plot.xls, Figure 3-13

Prepared by / Date: BJR 12/11/2015
Checked by / Date: LCG 12/21/2015

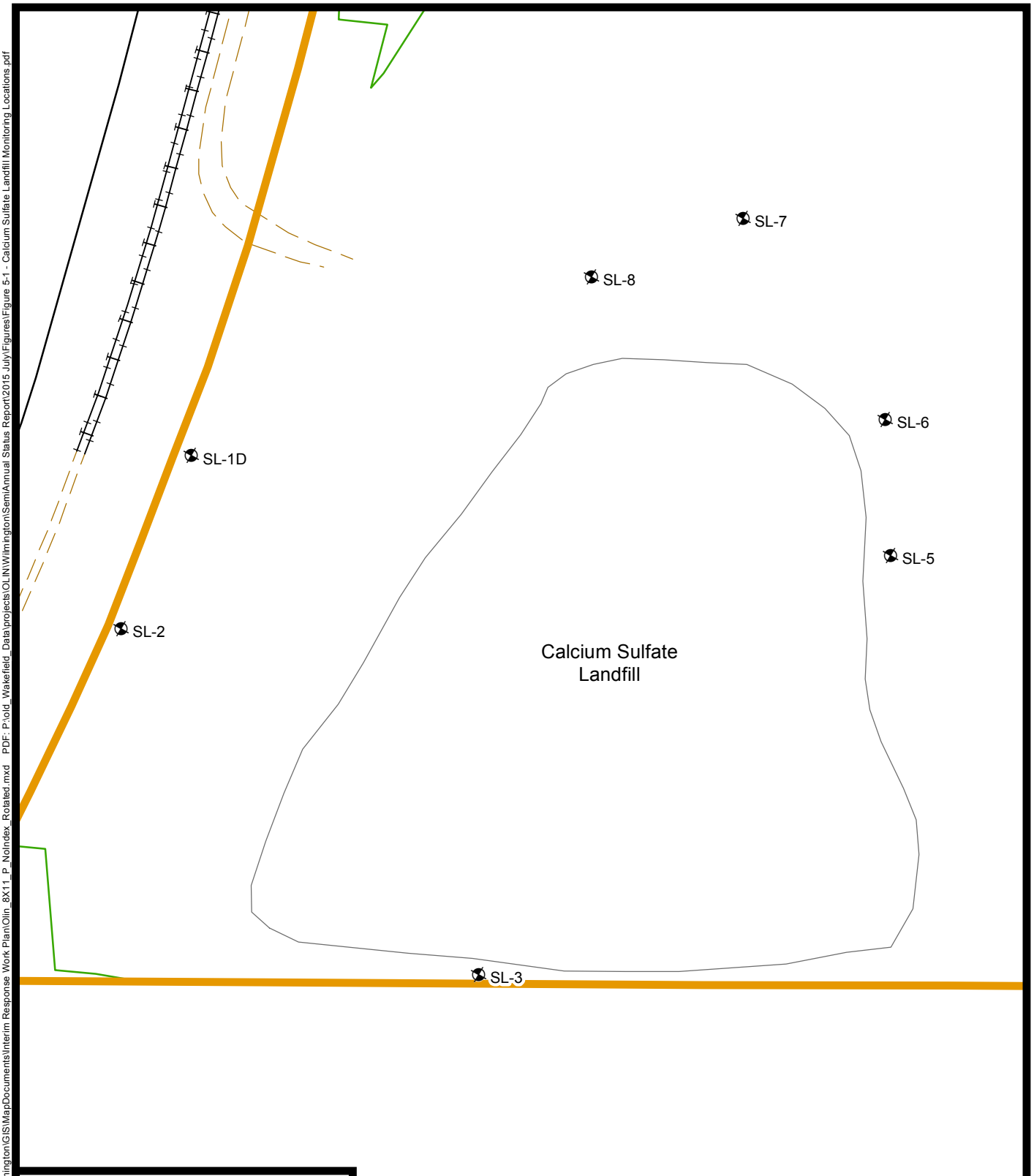
Figure 3-14
Water Levels (WL) and Monthly LNAPL Recovery
Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts



Notes:
LNAPL = Light Non-Aqueous Phase Liquid

P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Figures\
Monthy and Cumulative LNAPL Recovery Data Plot.xls, Figure3-14

Prepared by / Date: BJR 12/11/2015
Checked by / Date: LCG 12/21/2015



Legend

- Groundwater Monitoring Location
- 51 Eames St. Property Boundary
- Railroad
- Structures
- Surface Water
- Wetland Boundary

N

0 40 80 Feet

Prepared/Date: BJR 07/02/15
Checked/Date: CTM 07/02/15

amec foster wheeler

Figure 5-1
Calcium Sulfate Landfill
Monitoring Locations

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_8X11_P_NoIndex_Rotated.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 July\Figures\Figure 5-1 - Calcium Sulfate Landfill Monitoring Locations.pdf

APPENDIX A

Interim Response Steps Field Activity Reports

A-1 Second Quarter 2015 Sampling Event
A-2 Third Quarter 2015 Sampling Event

APPENDIX A

Interim Response Steps Field Activity Reports

A-1 Second Quarter 2015 Sampling Event

INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT
SECOND QUARTER 2015 SAMPLING EVENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT
SECOND QUARTER 2015 SAMPLING EVENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

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GLOSSARY OF ACRONYMS

AMEC	AMEC Environment & Infrastructure, Inc.
Amec Foster Wheeler	Amec Foster Wheeler Environment and Infrastructure, Inc.
DO	Dissolved Oxygen
IRSWP	Interim Response Steps Work Plan
LNAPL	Light Non-Aqueous Phase Liquid
MACTEC	MACTEC Engineering and Consulting, Inc.
NTU	Nephelometric Turbidity Units
ORP	Oxidation/Reduction Potential
RI/FS	Remedial Investigation/Feasibility Study
SC	Specific Conductivity
TAL	TestAmerica Laboratories, Inc.
USEPA	United States Environmental Protection Agency
UV	Ultraviolet

1.0 INTRODUCTION

On behalf of the Olin Corporation (Olin), Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler (formerly AMEC)) presents this summary report for field activities completed in association with the Second Quarter 2015 groundwater and surface water monitoring and cap inspection for the Slurry Wall/Cap Monitoring Program and the Plant B Monitoring Program. These activities were conducted consistent with the requirements and procedures contained in the Final Interim Response Steps Work Plan (IRSWP), Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts dated August 8, 2008 and the Volume IIIB, the Quality Assurance Project Plan, of the Final Remedial Investigation/Feasibility Study (RI/FS) Work Plan dated August 14, 2009 (MACTEC Engineering and Consulting, Inc. [MACTEC], 2009).

1.1 Limitations

This report, including its findings, opinions, and conclusions, is intended for the exclusive use and benefit of, and may be relied upon only by Olin Corporation and the United States Environmental Protection Agency (USEPA).

2.0 SLURRY WALL/CAP MONITORING PROGRAM

The purpose of the Slurry Wall/Cap Monitoring Program is to monitor the concentrations of select constituents in groundwater and surface water in areas adjacent to and within the South Ditch and to monitor the physical condition of the temporary cap at the Containment Area of the former Olin Facility located at 51 Eames Street, Wilmington, Massachusetts.

The Second Quarter 2015 groundwater and surface water monitoring program includes collecting groundwater level measurements from select monitoring wells and piezometers, collecting and analyzing groundwater samples from fifteen monitoring wells and five piezometers, and collecting and analyzing surface water samples from seven locations within the East Ditch and South Ditch. Groundwater and surface water sample locations are listed in **Table 1** and shown on **Figure 1**. The groundwater and surface water sampling program is further described in the Final IRSWP (MACTEC, 2008), which has been approved by the USEPA.

2.1 Scope of Work

The Slurry Wall/Cap Monitoring Program for this sampling event consists of: collecting groundwater level measurements in the vicinity of the South Ditch area; collecting and analyzing groundwater samples from the following monitoring wells: GW-10S, GW-24, GW-25, GW-34SR, GW-34D, GW-35S, MP-2 #13, GW-43SR, GW-76S, GW-78S, GW-79S, GW-201S, GW-202S, GW-202D, and GW-CA-1; and piezometers: PZ-16RR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25; collecting and analyzing surface water samples from the following locations: ISCO-1, ISCO-2, ISCO-3, SD-17, PZ-16RR, PZ-17RRR, and PZ-18R; inspecting and documenting the condition of the temporary cap; and downloading water level and barometric pressure data from data loggers that have been installed in the following wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S. Monitoring wells, piezometers, and surface water sample locations are shown on **Figure 1**.

2.1.1 Groundwater Level Measurement

From May 18 through June 3, 2015, Olin personnel completed a site reconnaissance of the monitoring well locations in the Slurry Wall/Cap Monitoring Program and collected groundwater level measurements. This included measuring depth to groundwater from 22 monitoring wells and piezometers using a water level meter. Groundwater level measurements and calculated groundwater elevations are summarized in **Table 2**.

2.1.2 Groundwater Sampling

From May 18 through June 3, 2015, Olin personnel sampled groundwater from 14 monitoring wells and five piezometers using 2010 USEPA low stress (low flow) groundwater sampling methods. Location GW-10S was dry and not able to be sampled. Monitoring well GW-10S was dry and therefore could not be sampled.

Prior to low flow sampling, a Horiba U-52 water quality meter and a Hach 2100Q turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions. The field instruments calibration records are contained in **Appendix A**. No readings were noted outside the manufacturer calibration ranges.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at each monitoring location. During sampling activities, the purged groundwater was continuously monitored using the multi-parameter water quality meter for pH, temperature,

specific conductivity (SC), dissolved oxygen (DO), and oxidation/reduction potential (ORP), while turbidity was monitored using the Hach 2100Q turbidity meter. Well purging continued at each location until these field parameters stabilized as indicated in Appendix A of the IRSWP.

No readings were noted outside the 2010 USEPA low flow stabilization guidelines. Monitoring locations GW-24, PZ-16RR, and PZ-17RRR went dry upon purging and could not be low flow sampled. Locations that draw down are typically purged dry and sampled upon recharging. The final low flow purging field parameter measurements are presented in **Table 3**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon stabilization of groundwater parameters, groundwater samples were collected by directly filling the laboratory prepared sample bottles. A 0.45-micron pore diameter, in-line Teflon™ filter was used to field filter groundwater for dissolved metal analysis in accordance with the IRSWP. The samples were placed on ice and transferred to TestAmerica Laboratories, Inc. (TAL) of Westfield, Massachusetts, under chain-of-custody for chemical analyses as summarized in **Table 4**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data are presented in the January 2016 Semi-Annual Status Report.

Purged groundwater from each monitoring well was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

2.1.3 Surface Water Sampling

On May 27, 2015, Olin personnel collected seven surface water samples from downstream to upstream from the East Ditch and South Ditch. The locations are identified as ISCO-3, ISCO-2, PZ-16RR, PZ-17RRR, SD-17, PZ-18R, and ISCO-1 as shown on **Figure 1**.

Before field activities began, Horiba U-52 water quality meter and Hach 2100Q turbidity meter were properly calibrated to monitor surface water quality parameters at each location. The calibration records can be found in **Appendix A**. No readings were noted outside the manufacturer calibration ranges.

At each of the seven field locations, surface water parameter measurements (pH, temperature, SC, ORP, DO, and turbidity) were collected. Readings were collected by directly submersing the Horiba probe into the surface water until parameter stabilization. The final surface water field parameters are summarized in **Table 5**. Field data records from each surface water sample location are attached in **Appendix A**.

Filtered surface water samples (for dissolved metals analysis) were collected by submerging dedicated tubing attached to a peristaltic pump into the water (approximately from 0.1 feet to 0.5 feet into the surface water). A peristaltic pump was used to reduce the entrapment of floating or suspended sediment and provide positive pressure for field filtering the water through the 0.45-micron pore diameter filter for dissolved metal analysis.

Surface water samples were collected by directly filling the laboratory prepared glassware. The samples were then placed on ice for delivery to TAL of Westfield, Massachusetts, under chain-of-custody for chemical analyses summarized in **Table 6**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data are presented in the January 2016 Semi-Annual Status Report.

2.1.4 Data Logger Data Download

Data loggers are deployed in 10 monitoring wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S, to continuously monitor groundwater elevation proximate to the cap area. Amec Foster Wheeler downloaded data from the 10 data loggers, along with data from the barometric pressure data logger deployed in GW-35S. Downloaded data from the loggers are presented in the January 2016 Semi-Annual Status Report.

2.1.5 Cap Inspection

The temporary cap is composed of ten large and three small scrim reinforced polyethylene sheets of 8 mil thickness (**Figure 2**). These sheets were factory fabricated with double welded seams from smaller, narrower panels. The seams between the large sheets were field fabricated by folding and sewing the edges of the sheets together with an ultraviolet (UV) -resistant thread. The original temporary cap was installed in 2001 and consisted of a 6 mil thick sheet. Due to deterioration of the 6 mil sheet, it was replaced by the current 8 mil thick cover in 2003. The 8 mil cover was placed directly over the 6 mil cover and re-ballasted with sand bags to resist wind uplift. Quarterly inspections of the 8 mil cover were instituted in 2003 to evaluate the need for periodic maintenance and to document maintenance and repair activities. Since then, Olin has replaced sections of the temporary cap sheeting damaged from wind up lift on May 7, 2012 and April 30, 2013.

On June 16, 2015, Amec Foster Wheeler field personnel performed a visual inspection of the Temporary Cap surface. Photographs taken during the inspection are presented in **Appendix C**. In general, the temporary cap was observed to be in good condition and repairs previously completed by Olin personnel were intact. Major repairs (replacement / re-stitching of several cap panels; replacing and adding sandbags; and adding ballast along the perimeter) to the cap also appear to be in good condition. The temporary cap surface contains some sediment from previously deteriorated sand bags, small areas of vegetation, several small areas of water, some minor fraying to the edges of some sheets that do not compromise the welded seams, and some minor perforations. Amec Foster Wheeler's observations are summarized in **Figure 2**. Temporary cap monitoring activities are summarized below.

2.1.5.1 Activities Completed During This Inspection

- Walking and inspecting the sewn seams for evidence of deterioration of the UV–resistant thread.
- Observing areas of sewn seams in low spots.
- Checking sand bags and other areas where vegetation is growing to verify the roots have not penetrated the polyethylene cover.
- Providing photo-documentation of typical cap conditions.

2.1.5.2 Observations During This Inspection

- The scrim reinforced polyethylene cover remains flexible and is generally in good condition; however, several areas were observed where the scrim reinforcement thread (within the polyethylene sheet) is showing signs of deterioration.
- Sewn seams utilizing UV-resistant thread are intact and do not show signs of deterioration.

- Amec Foster Wheeler observed several tears and perforations on the cap surface. These locations were identified to the Olin on-Site manager for repair by Olin as part of normal maintenance.
- Several sandbags were observed to be not securely tied, ripped open, or destroyed.
- Wild seeding from surrounding areas has resulted in vegetation growth from under some sand bags and low lying areas above the cap surface. Most plant roots, where observed, do not appear to penetrate the underlying polyethylene sheet; however, several plants were observed growing through the polyethylene sheet on the northeast portion of the cap; it is recommended this vegetation be periodically removed and the cap repaired.
- Several small areas and a few larger areas of standing water were observed on the cap surface, including around the main drain.
- Some previously repaired perforations need to be repaired again since the existing patches are starting to lift from the cap preventing a proper seal. These locations were identified to the Olin on-Site manager for repair by Olin as part of normal maintenance
- The gravel ballast placed along the perimeter of the cap remains in place.
- Vegetation surrounds the cap internal drain grate, which may impede the active draining of standing water from the cap surface.
- Water was not observed between the two “cap” membranes east of the drainage grate.

2.1.5.3 Discussion

The general physical condition of the cap membrane and sewn seams appear in good condition considering its age and direct exposure to sunlight and the elements; however, some areas of the scrim reinforcement thread were observed to be deteriorating.

The areas of vegetation growth that exist above the cap surface do not appear to affect the polyethylene sheeting. The polyethylene sheet continues to perform its intended function as the UV protection provided by its carbon black content has protected the polymer from significant deterioration.

Olin site personnel have repaired perforations and minor damage to the cap with a polyethylene repair tape with mastic backing. These repairs were generally observed to be in good condition, with only a few exceptions noted. Olin continues to repair previous locations observed by Amec Foster Wheeler that require resealing.

2.1.5.4 Recommendations

It is recommended that the current program of cap inspections and maintenance (including: patching the perforations noted during the cap inspection; inspecting the internal drain and removing vegetation within the drainage grate; removing vegetation growth from the cap; and visually monitoring the cap for future changes in condition) be continued.

3.0 PLANT B MONITORING PROGRAM

The purpose of the Plant B groundwater sampling and analysis program is to monitor groundwater quality at select monitoring wells and conduct gauging activities to determine groundwater elevations and light non-aqueous phase liquid (LNAPL) thickness.

3.1 Scope of Work

The Second Quarter Plant B Monitoring Program consisted of measuring groundwater levels in 28 monitoring wells within the Plant B area, gauging LNAPL thickness in monitoring wells where LNAPL was observed, and USEPA low stress (low flow) groundwater sampling at monitoring well GW-16R. Groundwater monitoring wells from the Plant B Monitoring Program are listed in **Table 7** and the monitoring well locations are shown on **Figure 3**.

3.1.1 Groundwater Level Measurements and LNAPL Gauging

On May 27, 2015, Olin personnel completed a site reconnaissance of the monitoring well locations in the Plant B Monitoring Program and collected groundwater level measurements and LNAPL thickness measurements. Depth to groundwater was measured in 28 monitoring wells using a water interface probe. For wells with observed LNAPL, LNAPL thickness was measured using an oil/water interface probe. Groundwater level measurements, groundwater elevations, and LNAPL thickness measurements are summarized in **Table 7**.

3.1.2 Groundwater Sampling

On May 27, 2015, Olin personnel sampled groundwater from monitoring well GW-16R following the 2010 USEPA low stress (low flow) groundwater sampling method.

Prior to low flow sampling, a Horiba U-52 water quality meter and Hach 2100Q turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions. The field instrument calibration record is contained in **Appendix A**. No readings were noted outside the manufacturer calibration ranges.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at the sample location. During sampling activities, the purged groundwater was continuously monitored using the Horiba U-52 multi-parameter water quality meter for pH, temperature, SC, DO, and ORP, while turbidity was monitored using the Hach 2100Q turbidity meter. Well purging continued at the sample location until these field parameters stabilized as indicated in Appendix A of the IRSWP. No readings were noted outside the 2010 USEPA low flow stabilization guidelines. The final low flow purging field parameter measurements are presented in **Table 8**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon groundwater parameter stabilization, groundwater samples were collected by directly filling the laboratory prepared glassware. The samples were placed on ice, and were transferred to TAL of Westfield, Massachusetts, under chain-of-custody for chemical analyses as summarized in **Table 9**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the January 2016 Semi-Annual Status Report.

Purged groundwater from sampling activities was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

4.0 REFERENCES

MACTEC Engineering and Consulting, Inc. (MACTEC), August 8, 2008. *Final Interim Response Steps Work Plan*, Olin Chemical Superfund Site, Wilmington, Massachusetts.

MACTEC, August 14, 2009. Final RI/FS Work Plan, Olin Chemical Superfund Site, Wilmington, Massachusetts.

TABLES

Table 1
Groundwater and Surface Water Sampling Locations
Slurry Wall/Cap Monitoring Program
Second Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Groundwater	Surface Water
GW-10S***	ISCO1
GW-24	ISCO2
GW-25	ISCO3
GW-26 *	PZ-16RR
GW-34SR	PZ-17RRR
GW-34D	**PZ-18R**
GW-35S	SD-17
GW-42S **	
GW-43SR	
GW-76S	
GW-78S	
GW-79S	
GW-201S	
GW-202S	
GW-202D	
GW-CA1	
PZ-16RR	
PZ-17RRR #	
PZ-18R	
PZ-24	
PZ-25	
GW-16R ^	

Notes:
Bold - DUP/ MS/ MSD collected
* - Well removed for detention basin construction
** - Well destroyed
# - Piezometer replaced in South Ditch
^ - Plant B Monitoring Well
*** - GW-10S was Dry

Prepared by: CTM 09/08/2015
Checked by: LCG 09/15/2015

Table 2
Groundwater Elevations
Slurry Wall/Cap Monitoring Program
Second Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL ID	Reference Elevation	Depth to Water (1, 2)	Groundwater Elevation (3)	Notes	Date Measured
I.D.	(ft msl)	(ft)	(feet NGVD)		
GW-10S	89.10	Dry	---		5/26/2015
GW-24	83.43	2.50	80.93		5/26/2015
GW-25	85.97	5.26	80.71		5/26/2015
GW-26*	84.93	*	---		---
GW-34D	90.36	8.44	81.92		5/28/2015
GW-34SR	89.13	7.19	81.94		5/28/2015
GW-35S	88.51	7.49	81.02		5/28/2015
GW-39	83.64	3.59	80.05		6/3/2015
GW-42S**	84.18	**	---		---
GW-43SR	87.86	6.26	81.60		6/3/2015
GW-55S	81.70	2.23	79.47		6/3/2015
GW-55D	81.95	2.62	79.33		6/3/2015
GW-76S	88.45	7.41	81.04	TOC	5/26/2015
GW-78S	84.89	4.45	80.44		5/19/2015
GW-79S	81.54	3.81	77.73		5/19/2015
GW-201S	83.29	3.49	79.80		6/3/2015
GW-202S	86.97	6.45	80.52		5/18/2015
GW-202D	86.52	5.87	80.65		5/18/2015
GW-CA1	88.01	7.01	81.00		5/28/2015
PZ-16RR/IN	81.0	3.48	77.52		5/19/2015
PZ-16RR/OUT (4)	81.0	Dry	---		5/16/2015
PZ-17RRR/IN	***	2.35	---		5/19/2015
PZ-17RRR/OUT (4)	***	Dry	---		5/19/2015
PZ-18R/IN	82.42	1.84	80.58		6/3/2015
PZ-18R/OUT (4)	82.42	1.84	80.58		6/3/2015
PZ-24	89.43	8.74	80.69		5/18/2015
PZ-25	88.90	8.35	80.55		5/18/2015

Prepared by: CTM 09/08/2015
Checked by: LCG 09/14/2015

Notes:
(1) - Measurement from top of PVC. If no PVC, measurement from TOC
(2) - Collected using a Solinst water interface probe
(3) - Groundwater Elevation = Reference Elevation - Depth to Water
(4) - Reported elevation of surface water adjacent to piezometer
TOC - Water level measurement taken from Top of Casing
* - Well removed for detention basin construction
** - Well destroyed during paving
*** - Piezometer replaced in South Ditch. Not surveyed
NGVD - National Geodetic Vertical Datum
msl - mean sea level
ft - feet

Table 3
Final Field Parameters for Groundwater Sampling
Slurry Wall/Cap Monitoring Program
Second Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Quarterly Slurry Wall/Cap Monitoring Well Samples						**Quarterly Slurry Wall/Cap Piezometer Samples**				
Location ID	GW-25	GW-78S	GW-79S	GW-202S	GW-202D	PZ-16RR	PZ-17RRR	PZ-18R	PZ-24	PZ-25
Date	5/26/2015	5/19/2015	5/19/2015	5/18/2015	5/18/2015	5/19/2015	5/19/2015	6/3/2015	5/18/2015	5/18/2015
Depth to Water (ft)	5.59	4.80	3.93	6.49	5.98	Dry	Dry	2.75	8.77	8.36
Temperature (° C)	13.04	10.71	13.57	12.01	12.90	13.09	13.86	13.48	11.76	11.49
Specific Conductivity (µS/cm)	0.804*	1.06*	2.16*	0.758*	4.59*	2.02*	0.911*	6.08*	1.93*	1.18*
pH (standard units)	6.38	6.35	5.87	6.09	4.77	7.18	7.44	6.39	6.25	6.25
Dissolved Oxygen (mg/L)	0.51	0.47	0.44	0.48	0.36	8.14	3.58	1.12	0.44	1.04
Turbidity (NTU)	1.56	1.07	31.7	0.55	2.53	153	135	3.40	3.70	1.74
ORP (millivolts)	-127.0	25.0	-45.0	66.0	200.0	-190.0	-205.0	-107.0	-106.0	-38.0

Semiannual Slurry Wall/Cap Monitoring Well Samples										
Location ID	GW-10S	GW-24	GW-34SR	GW-34D	GW-35S	MP-2#13	GW-43SR	GW-76S	GW-201S	GW-CA-1
Date	5/26/2015	5/26/2015	5/28/2015	5/28/2015	5/28/2015	6/3/2015	6/3/2015	5/26/2015	6/3/2015	5/28/2015
Depth to Water (ft)	Dry	Dry	7.19	8.44	7.65	Multi-port	6.26	7.43	3.71	7.01
Temperature (° C)	---	18.51	20.14	20.57	23.86	12.26	12.52	16.50	13.53	17.44
Specific Conductivity (µS/cm)	---	0.287*	0.038*	0.108*	0.731*	1.54*	0.861*	0.150*	2.46*	0.333*
pH (standard units)	---	7.99	5.68	6.23	6.51	4.45	4.75	6.04	6.19	6.60
Dissolved Oxygen (mg/L)	---	0.35	1.14	0.46	0.86	0.69	0.50	0.28	0.47	0.79
Turbidity (NTU)	---	0.20	1.79	2.14	7.81	0.83	1.03	39.2	2.97	1.19
ORP (millivolts)	---	-136.0	174.0	76.0	-159.0	136.0	233.0	92.0	46.0	74.0

Notes:
ft - feet
µS/cm - microSiemens per centimeter
* - mS/cm (milliSiemens per centimeter)
1 µS/cm = 0.001 mS/cm
mg/L - milligrams per liter
NTU - nephelometric turbidity units
ORP - Oxidation/Reduction Potential
mV - millivolts

Prepared by: CTM 09/08/2015
Checked by: LCG 09/14/2015

Table 4
Groundwater Laboratory Analytical Program
Slurry Wall/Cap Monitoring Program
Second Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Chloride	EPA 300.0	0.28	mg/L
Specific Conductivity	SM18 2510B	1.0	µmhos/cm
Sulfate	EPA 300.0	0.35	mg/L
Filtered Metals			
Aluminum, filtered	SW846 6010B	60	µg/L
Chromium, filtered	SW846 6010B	1.0	µg/L

Notes:
mg/L - milligrams per liter
µmhos/cm - micromhos per centimeter
µmhos/cm = µS/cm (microSiemens per centimeter)
1 µS/cm = 0.001 mS/cm (milliSiemens per centimeter)
µg/L - micrograms per liter

Prepared by: CTM 09/08/2015
Checked by: LCG 09/08/2015

Table 5
Final Field Parameters for Surface Water Sampling
Slurry Wall/Cap Monitoring Program
Second Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Surface Water Samples							
Location ID	ISCO1	ISCO2	ISCO3	PZ-16RR	PZ-17RRR	PZ-18R	SD-17
Date	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015
Sample Depth of Water (ft)	0.58	0.13	0.13	0.17	0.25	0.50	0.21
Temperature (°C)	19.74	20.93	21.53	22.96	17.14	20.09	17.46
Specific Conductivity (µS/cm)	0.966*	1.96*	0.812*	0.564*	1.42*	0.951*	1.41*
pH (standard units)	5.92	6.54	6.59	6.65	6.02	5.94	6.01
Dissolved Oxygen (mg/L)	2.12	5.09	6.92	6.15	6.16	2.09	4.96
Turbidity (NTU)	16.5	80.8	2.20	193	18.1	19.0	56.8
ORP (millivolts)	30.0	-27.0	-21.0	-27.0	1.0	19.0	4.0

Notes:
ft - feet
µS/cm - microSiemens per centimeter
* - mS/cm (milliSiemens per centimeter)
1 µS/cm = 0.001 mS/cm
mg/L - milligrams per liter
NTU - nephelometric turbidity units
ORP - Oxidation/Reduction Potential
mV - millivolts

Prepared by: CTM 09/08/2015
Checked by: LCG 09/14/2015

Table 6
Surface Water Analytical Program
Slurry Wall/Cap Monitoring Program
Second Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Nitrate	EPA 300.0	0.02	mg/L
Nitrite	EPA 300.0	0.02	mg/L
Chloride	EPA 300.0	0.28	mg/L
Specific Conductivity	SM18 2510B	1.0	µmhos/cm
Sulfate	EPA 300.0	0.35	mg/L
Total Metals			
Aluminum, Total	SW846 6010B	60	µg/L
Chromium, Total	SW846 6010B	1.0	µg/L
Sodium, Total	SW846 6010B	320	µg/L
Filtered Metals			
Aluminum, Filtered	SW846 6010B	60	µg/L
Chromium, Filtered	SW846 6010B	1.0	µg/L
Sodium, Filtered	SW846 6010B	320	µg/L

Notes:
mg/L - milligrams per liter
µmhos/cm - micromhos per centimeter
µmhos/cm = µS/cm (microSiemens per centimeter)
1 µS/cm = 0.001 mS/cm (milliSiemens per centimeter)
µg/L - micrograms per liter

Prepared by: CTM 09/08/2015
Checked by: LCG 09/15/2015

Table 7
Groundwater Elevations
Plant B Monitoring Program
Second Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL ID	Reference Elevation (1)	Depth to Water (2)	Depth to Product (3)	Product Thickness (4)	Groundwater Elevation (5)	Date Measured
I.D.	(ft msl)	(ft)	(ft)	(ft)	(feet NGVD)	
B-2	90.48	11.38	NPD	NA	79.10	5/27/2015
B-3	90.32	10.74	NPD	NA	79.58	5/27/2015
B-5R	91.38	10.98	NPD	NA	80.40	5/27/2015
B-7A	88.81	7.65	NPD	NA	81.16	5/27/2015
B-17	91.55	9.34	NPD	NA	82.21	5/27/2015
GW-13	90.57	11.10	NPD	NA	79.47	5/27/2015
GW-14	88.70	9.03	NPD	NA	79.67	5/27/2015
GW-15	90.01	8.74	NPD	NA	81.27	5/27/2015
GW-16R	91.21	10.67	NPD	NA	80.54	5/27/2015
GW-23	91.04	10.84	10.78	0.06	80.26	5/27/2015
GW-52S	87.95	8.62	NPD	NA	79.33	5/27/2015
GW-100	90.15	11.15	NPD	NA	79.00	5/27/2015
GW-101	90.14	11.29	NPD	NA	78.85	5/27/2015
GW-102	89.00	10.05	NPD	NA	78.95	5/27/2015
IW-1	90.71	11.20	NPD	NA	79.51	5/27/2015
IW-2	90.53	11.31	11.31	<0.01	79.22	5/27/2015
IW-3	90.76	11.44	11.44	<0.01	79.32	5/27/2015
IW-6	89.15	10.29	NPD	NA	78.86	5/27/2015
IW-7	90.10	11.07	NPD	NA	79.03	5/27/2015
IW-8	89.94	11.06	NPD	NA	78.88	5/27/2015
IW-9	89.78	10.74	NPD	NA	79.04	5/27/2015
IW-10	90.43	11.28	NPD	NA	79.15	5/27/2015
IW-11	89.92	13.58	13.54	0.04	76.38	5/27/2015
IW-12	90.31	11.31	NPD	NA	79.00	5/27/2015
IW-13	89.90	10.80	10.80	<0.01	79.10	5/27/2015
PID	89.97	10.99	10.99	<0.01	78.98	5/27/2015
P5	90.45	11.38	11.36	0.02	79.09	5/27/2015
12-IN	89.84	10.58	10.58	<0.01	79.26	5/27/2015

Notes:

Prepared by: CTM 09/08/2015
Checked by: LCG 09/14/2015

(1) - Reference elevations surveyed 11/97. New TOC survey by Dana Perkins 4-5/98
(2) - Top of PVC. If no PVC, measurement from top of steel casing
(3) - Collected using a Solinst water interface probe or Geotech oil/water interface probe
(4) - If sheen is noted, a product thickness of 0.01 feet will be used to calculate the groundwater elevation
(5) - Groundwater Elevation = Reference Elevation - (Depth to Water - (Product Thickness x 0.95))
TOC - Top of Casing
NPD - No Product Detected
NA - Not Applicable
NGVD - National Geodetic Vertical Datum
msl - mean sea level
ft - feet
East Ditch - No sheen noted; Observed OK

Table 8
Final Field Parameters for Groundwater Sampling
Plant B Monitoring Program
Second Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Plant B Monitoring Well Samples	
Location	GW-16R
Date	5/27/2015
Depth to Water (ft)	11.78
Temperature (° C)	18.19
Specific Conductivity (µS/cm)	0.167*
pH (standard units)	6.25
Dissolved oxygen (mg/L)	0.92
Turbidity (NTU)	28.9
Oxidation Reduction Potential (mV)	-40.0

Notes:
ft - feet
µS/cm - microSiemens per centimeter
* - mS/cm (milliSiemens per centimeter)
1 µS/cm = 0.001 mS/cm
mg/L - milligrams per liter

Prepared by: CTM 09/08/2015
Checked by: LCG 09/14/2015

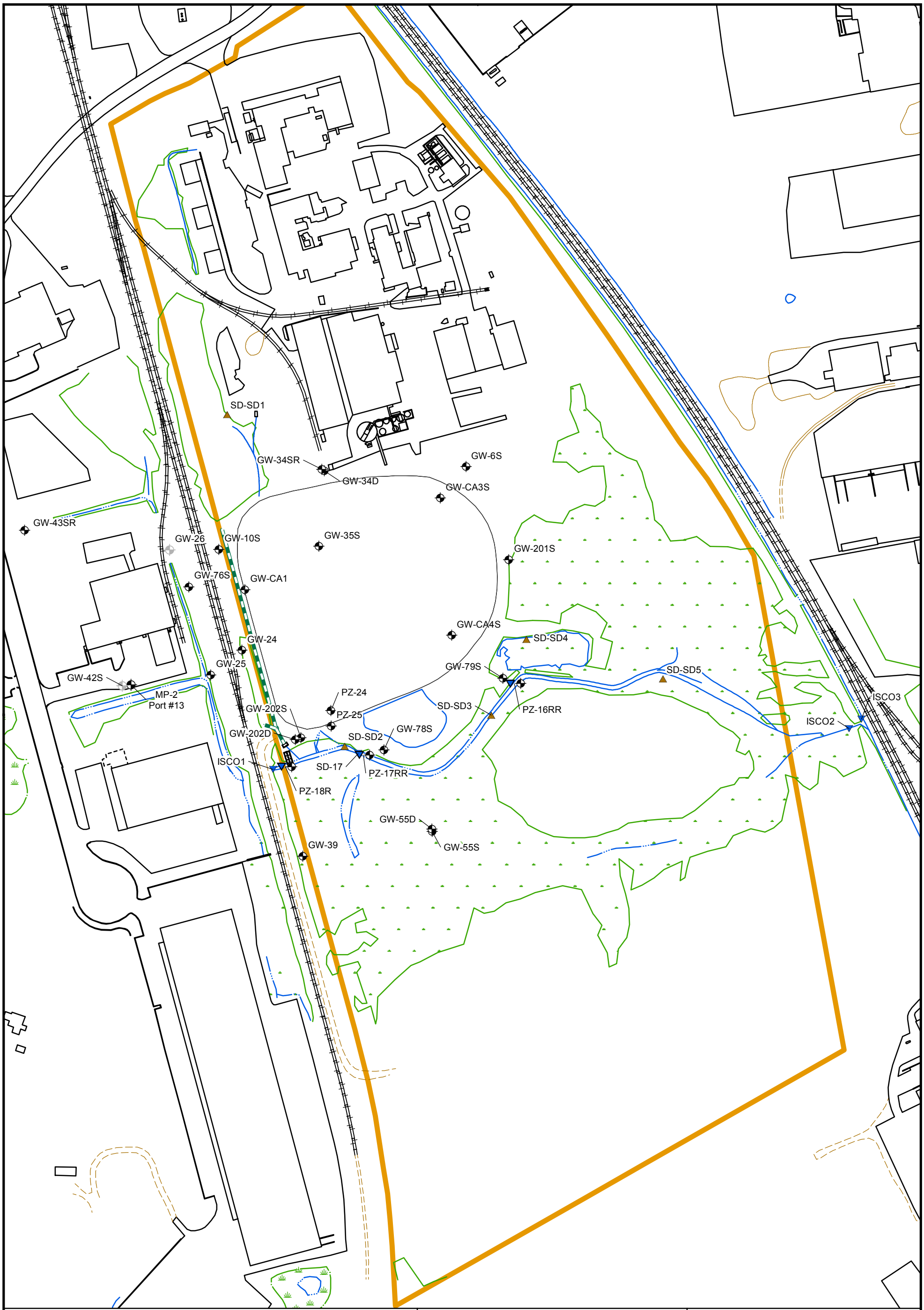
Table 9
Groundwater Laboratory Analytical Program
Plant B Monitoring Program
Second Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Volatile organic compounds (VOC)			
2,4,4-Trimethyl-1-pentene	SW846 8260B	0.40	µg/L
2,4,4-Trimethyl-2-pentene	SW846 8260B	0.43	µg/L
Semivolatile organic compounds (SVOC)			
N-nitrosodiphenylamine	SW846 8270C	0.3	µg/L
bis(2-ethylhexyl)phthalate	SW846 8270C	1.7	µg/L
Volatile Petroleum Hydrocarbons (VPH)			
C5-C8 Aliphatics	MA VPH	1.5	µg/L
C5-C8 Aliphatics, Unadjusted	MA VPH	1.5	µg/L
C9-C12 Aliphatics	MA VPH	1.5	µg/L
C9-C12 Aliphatics, Unadjusted	MA VPH	1.5	µg/L
C9-C10 Aromatics	MA VPH	0.50	µg/L
Methyl-tert-butyl-ether (MTBE)	MA VPH	0.25	µg/L
Benzene	MA VPH	0.25	µg/L
Ethylbenzene	MA VPH	0.25	µg/L
m,p-Xylene	MA VPH	0.50	µg/L
o-Xylene	MA VPH	0.25	µg/L
Toluene	MA VPH	0.25	µg/L
Naphthalene	MA VPH	0.25	µg/L
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
pH	SM 4500 H+ B	0.10	SU
Filtered Metals			
Iron, Filtered	SW846 6010B	19	µg/L

Notes:
µg/L - micrograms per liter
mg/L - milligrams per liter
SU - standard units

Prepared by: CTM 09/08/2015
Checked by: LCG 09/15/2015

FIGURES



Legend

- Groundwater Monitoring Location
- Groundwater and Surface Water Monitoring Location
- Surface Water Location
- Sediment Sample Location
- Destroyed Monitoring Well
- Paved Road
- Unpaved Road
- Site Boundary
- Wetland Boundary
- Railroad
- Structure
- Water
- Culvert
- Trail

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Amec Foster Wheeler
Environment & Infrastructure
271 Mill Road
Chelmsford, MA 01824

N

0 90 180 360 Feet

Figure 1
Slurry Wall / Cap Monitoring Program Sampling Locations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 6/22/15 | Checked/Date: CTM 6/22/15

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_IRWP2.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\Figures\Figure 1 - Slurry Wall Cap Monitoring Program Sampling Locations.pdf

Legend

- CapSeams
- Monitoring Well

H-# = Hole
P-# = Perforations
R-# = Previous Repair Area
SB-# = Sandbag Not Tied
V-# = Vegetation
W-# = Ponding Water

Note:
Figure based on changes since last inspection.

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AMEC Foster Wheeler
Environment & Infrastructure
271 Mill Road
Chelmsford, MA 01824

N

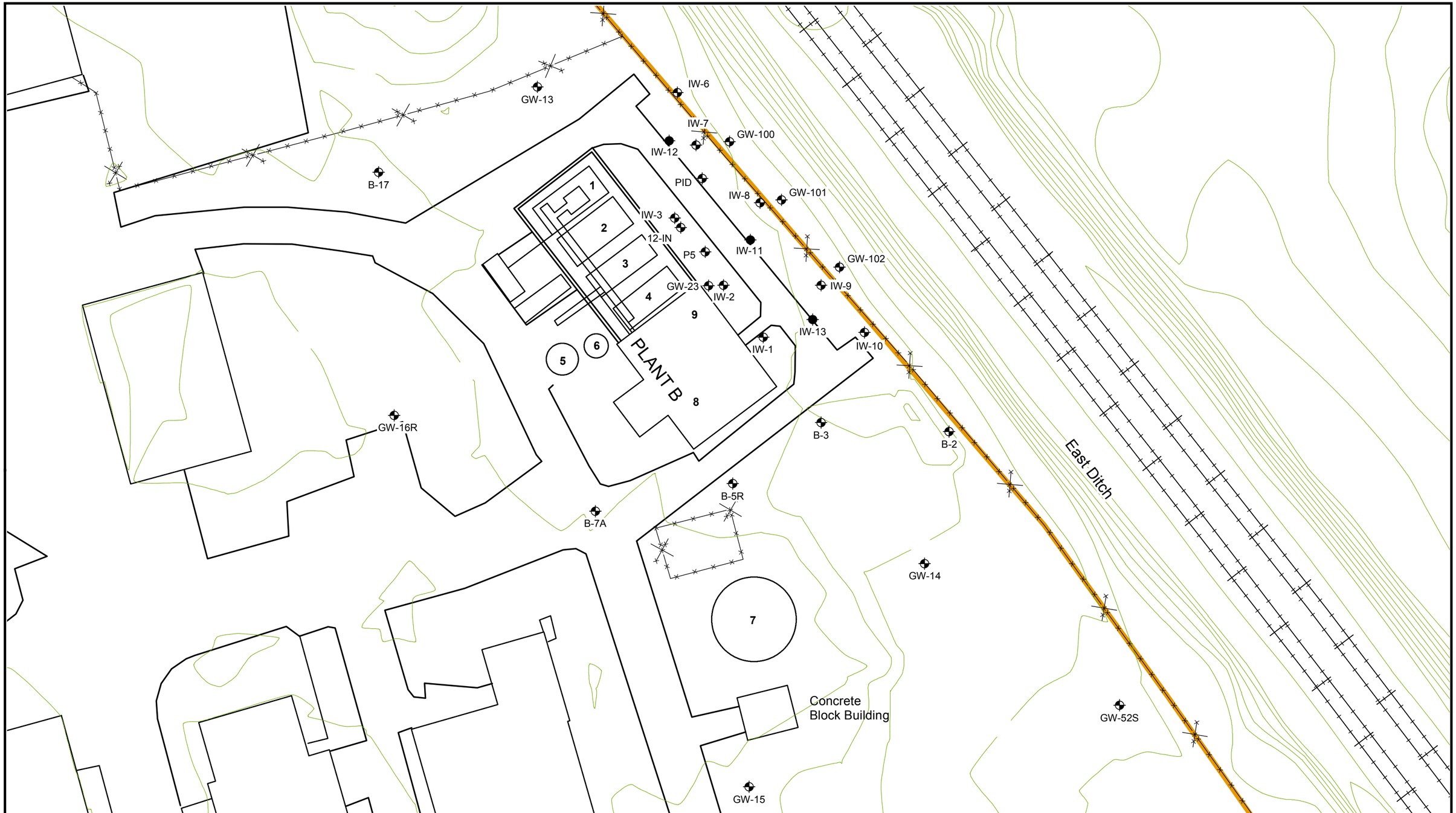
0 30 60 120 Feet

Figure 2
Second Quarter 2015 Temporary Cap Inspection Observations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared by BJR | Checked by CTM

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Olin_11X17_LS.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\2015 Quarterly\2nd Quarter 2015\Report\Figures\Figure 2 - Second Quarter 2015 Temporary Cap Inspection Observations.pdf



Tank #1 - Receives gravity overflow from Tank 2
and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Monitoring Well
- Recovery Well
- Elevation Contours

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Amec Foster Wheeler
Environment & Infrastructure
271 Mill Rd
Chelmsford, MA 01824

N

0 15 30 60 Feet

Figure 3
Plant B Monitoring Program
Sampling Locations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 06/22/15 | Checked/Date: CTM 06/22/15

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_PlantB_11X17_LS.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\Figures\Figure 3 - Plant B Monitoring Program Sampling Locations.pdf

APPENDIX A

Field Data Records and
Field Instrument Calibration Records

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME:	Olin Chemical Superfund Site	TASK NO:	DATE: 5/18/2015
PROJECT NUMBER:	6107150016	AMEC CREW:	Olin - BEG
PROJECT LOCATION:	51 Eames St, Wilmington, MA	SAMPLER NAME:	Brian Guichard
WEATHER CONDITIONS (AM):		SAMPLER SIGNATURE:	for Olin
WEATHER CONDITIONS (PM):		CHECKED BY: LCG	DATE: 9/14/2015

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time:)	AM Meter Value (End Time:)	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time:)	PM Meter Value (End Time:)	*Acceptance Criteria (PM)
pH (4)	SU	4.0	4.00	+/- 0.1 pH Units			
pH (7)	SU	7.0	-	+/- 0.1 pH Units	4.0	3.95	+/- 0.3 pH Units
pH (10)	SU	10.0	-	+/- 0.1 pH Units			
Redox	+/- mV		294	+/- 10 mV		281	+/- 10 mV
Conductivity	mS/cm	4.49	4.54	+/- 3% of standard	4.49	4.85	+/- 5% of standard
DO (saturated)	%		-	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	-	14.04	+/- 0.2 mg/L	-	10.86	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	-	< 0.5 mg/L			
Temperature	°C		11.56			15.94	
Baro. Press.	mmHg		-			-	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	11.1	10	11.0	+/- 5% of standard
Standard	NTU	20	21.6	20	21.5	
Standard	NTU	100	99.1	100	99.6	
Standard	NTU	800	801	800	800	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50		+/- 10% of standard
O_2	%	20.9		20.9		+/- 10% of standard
H_2S	ppmv	25		25		+/- 10% of standard
CO	ppmv	50		50		+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above **(see notes)**.

[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L)
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine Auto-Cal Solution	Pine Auto-Cal Solution
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Olin Cal Set	Olin Cal Set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

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* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME:	Olin Chemical Superfund Site	TASK NO:	DATE: 5/19/2015
PROJECT NUMBER:	6107150016	AMEC CREW:	Olin - BEG
PROJECT LOCATION:	51 Eames St, Wilmington, MA	SAMPLER NAME:	Brian Guichard
WEATHER CONDITIONS (AM):		SAMPLER SIGNATURE:	Brian G. Olin
WEATHER CONDITIONS (PM):		CHECKED BY: LCG	DATE: 9/14/2015

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time:)	AM Meter Value (End Time:)	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time:)	PM Meter Value (End Time:)	*Acceptance Criteria (PM)
pH (4)	SU	4.0	4.00	+/- 0.1 pH Units			
pH (7)	SU	7.0	-	+/- 0.1 pH Units	4.0	3.96	+/- 0.3 pH Units
pH (10)	SU	10.0	-	+/- 0.1 pH Units			
Redox	+/- mV		281	+/- 10 mV		273	+/- 10 mV
Conductivity	mS/cm	4.49	4.49	+/- 3% of standard	4.49	4.57	+/- 5% of standard
DO (saturated)	%		-	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	-	9.07	+/- 0.2 mg/L	-	8.19	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	-	< 0.5 mg/L			
Temperature	°C		19.93			16.72	
Baro. Press.	mmHg		-			-	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	11.2	10	11.4	+/- 5% of standard
Standard	NTU	20	21.5	20	21.9	
Standard	NTU	100	100	100	105	
Standard	NTU	800	802	800	809	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50		+/- 10% of standard
O_2	%	20.9		20.9		+/- 10% of standard
H_2S	ppmv	25		25		+/- 10% of standard
CO	ppmv	50		50		+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above **(see notes)**.

[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L)
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine Auto-Cal Solution	Pine Auto-Cal Solution
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Olin Cal Set	Olin Cal Set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

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* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME:	Olin Chemical Superfund Site	TASK NO:	DATE: 5/26/2015
PROJECT NUMBER:	6107150016	AMEC CREW:	Olin - BEG
PROJECT LOCATION:	51 Eames St, Wilmington, MA	SAMPLER NAME:	Brian Guichard
WEATHER CONDITIONS (AM):		SAMPLER SIGNATURE:	for Olin
WEATHER CONDITIONS (PM):		CHECKED BY: LCG	DATE: 9/14/2015

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time:)	AM Meter Value (End Time:)	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time:)	PM Meter Value (End Time:)	*Acceptance Criteria (PM)
pH (4)	SU	4.0	3.99	+/- 0.1 pH Units			
pH (7)	SU	7.0	-	+/- 0.1 pH Units	4.0	3.95	+/- 0.3 pH Units
pH (10)	SU	10.0	-	+/- 0.1 pH Units			
Redox	+/- mV		303	+/- 10 mV		281	+/- 10 mV
Conductivity	mS/cm	4.49	4.47	+/- 3% of standard	4.49	4.58	+/- 5% of standard
DO (saturated)	%		-	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	-	8.20	+/- 0.2 mg/L	-	7.75	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	-	< 0.5 mg/L			
Temperature	°C		23.12			21.89	
Baro. Press.	mmHg		-			-	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	11.1	10	11.2	+/- 5% of standard
Standard	NTU	20	21.4	20	21.3	
Standard	NTU	100	99.9	100	99.5	
Standard	NTU	800	803	800	795	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50		+/- 10% of standard
O_2	%	20.9		20.9		+/- 10% of standard
H_2S	ppmv	25		25		+/- 10% of standard
CO	ppmv	50		50		+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above **(see notes)**.

[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L)
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine Auto-Cal Solution	Pine Auto-Cal Solution
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Olin Cal Set	Olin Cal Set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

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* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME:	Olin Chemical Superfund Site	TASK NO:	DATE: 5/27/2015
PROJECT NUMBER:	6107150016	AMEC CREW:	Olin - BEG
PROJECT LOCATION:	51 Eames St, Wilmington, MA	SAMPLER NAME:	Brian Guichard
WEATHER CONDITIONS (AM):		SAMPLER SIGNATURE:	for Olin
WEATHER CONDITIONS (PM):		CHECKED BY: LCG	DATE: 9/14/2015

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time:)	AM Meter Value (End Time:)	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time:)	PM Meter Value (End Time:)	*Acceptance Criteria (PM)
pH (4)	SU	4.0	4.01	+/- 0.1 pH Units			
pH (7)	SU	7.0	-	+/- 0.1 pH Units	4.0	4.00	+/- 0.3 pH Units
pH (10)	SU	10.0	-	+/- 0.1 pH Units			
Redox	+/- mV		271	+/- 10 mV		288	+/- 10 mV
Conductivity	mS/cm	4.49	4.49	+/- 3% of standard	4.49	4.59	+/- 5% of standard
DO (saturated)	%		-	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	-	8.35	+/- 0.2 mg/L	-	7.82	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	-	< 0.5 mg/L			
Temperature	°C		25.28			25.35	
Baro. Press.	mmHg		-			-	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	11.1	10	11.2	+/- 5% of standard
Standard	NTU	20	21.4	20	21.4	
Standard	NTU	100	99.2	100	99.2	
Standard	NTU	800	801	800	801	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50		+/- 10% of standard
O_2	%	20.9		20.9		+/- 10% of standard
H_2S	ppmv	25		25		+/- 10% of standard
CO	ppmv	50		50		+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above **(see notes)**.

[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L)
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine Auto-Cal Solution	Pine Auto-Cal Solution
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Olin Cal Set	Olin Cal Set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

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* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME:	Olin Chemical Superfund Site	TASK NO:	DATE: 5/28/2015
PROJECT NUMBER:	6107150016	AMEC CREW:	Olin - BEG
PROJECT LOCATION:	51 Eames St, Wilmington, MA	SAMPLER NAME:	Brian Guichard
WEATHER CONDITIONS (AM):		SAMPLER SIGNATURE:	
WEATHER CONDITIONS (PM):		CHECKED BY: LCG	DATE: 9/14/2015

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time:)	AM Meter Value (End Time:)	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time:)	PM Meter Value (End Time:)	*Acceptance Criteria (PM)
pH (4)	SU	4.0	4.00	+/- 0.1 pH Units			
pH (7)	SU	7.0	-	+/- 0.1 pH Units	4.0	3.97	+/- 0.3 pH Units
pH (10)	SU	10.0	-	+/- 0.1 pH Units			
Redox	+/- mV		282	+/- 10 mV		218	+/- 10 mV
Conductivity	mS/cm	4.49	4.49	+/- 3% of standard	4.49	4.53	+/- 5% of standard
DO (saturated)	%		-	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	-	8.09	+/- 0.2 mg/L	-	7.61	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	-	< 0.5 mg/L			
Temperature	°C		24.76			25.51	
Baro. Press.	mmHg		-			-	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	11.3	10	11.4	+/- 5% of standard
Standard	NTU	20	21.2	20	21.6	
Standard	NTU	100	99.8	100	101	
Standard	NTU	800	803	800	801	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50		+/- 10% of standard
O_2	%	20.9		20.9		+/- 10% of standard
H_2S	ppmv	25		25		+/- 10% of standard
CO	ppmv	50		50		+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above **(see notes)**.

[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L)
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine Auto-Cal Solution	Pine Auto-Cal Solution
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Olin Cal Set	Olin Cal Set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

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* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME:	Olin Chemical Superfund Site	TASK NO:	DATE: 6/3/2015
PROJECT NUMBER:	6107150016	AMEC CREW:	Olin - BEG
PROJECT LOCATION:	51 Eames St, Wilmington, MA	SAMPLER NAME:	Brian Guichard
WEATHER CONDITIONS (AM):		SAMPLER SIGNATURE:	
WEATHER CONDITIONS (PM):		CHECKED BY: LCG	DATE: 9/14/2015

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time:)	AM Meter Value (End Time:)	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time:)	PM Meter Value (End Time:)	*Acceptance Criteria (PM)
pH (4)	SU	4.0	3.99	+/- 0.1 pH Units			
pH (7)	SU	7.0	-	+/- 0.1 pH Units	4.0	3.98	+/- 0.3 pH Units
pH (10)	SU	10.0	-	+/- 0.1 pH Units			
Redox	+/- mV		306	+/- 10 mV		265	+/- 10 mV
Conductivity	mS/cm	4.49	4.55	+/- 3% of standard	4.49	4.64	+/- 5% of standard
DO (saturated)	%		-	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	-	9.33	+/- 0.2 mg/L	-	11.84	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	-	< 0.5 mg/L			
Temperature	°C		14.05			14.32	
Baro. Press.	mmHg		-			-	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	11.6	10	11.9	+/- 5% of standard
Standard	NTU	20	23.2	20	24.2	
Standard	NTU	100	108	100	108	
Standard	NTU	800	835	800	833	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50		+/- 10% of standard
O_2	%	20.9		20.9		+/- 10% of standard
H_2S	ppmv	25		25		+/- 10% of standard
CO	ppmv	50		50		+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above **(see notes)**.

[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L)
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine Auto-Cal Solution	Pine Auto-Cal Solution
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Olin Cal Set	Olin Cal Set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

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* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

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FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-24	ROUND NO.	2
SAMPLE ID	OC-GW-24	SITE TYPE	Superfund	DATE	5/26/2015
TIME	START 10:40 END 11:30	JOB NUMBER	6107150016	BOTTLE TIME	11:15

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 2.50 FT.

WELL DEPTH (TOR): 11.91 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: N/A FT.

SCREEN LENGTH: N/A FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: ~ 1.00 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:45	3.82	110	20.17	0.306	7.62	8.57	39.3	-81	~ 11 ft.	
10:50	6.06	110	19.90	0.290	8.13	0.86	10.9	-156		
10:55	8.68	110	19.07	0.286	8.11	0.45	2.30	-146		
11:00	9.41	110	18.79	0.287	8.06	0.40	1.60	-142		
11:05	10.21	110	18.51	0.287	7.99	0.35	0.20	-136		
11:09	Well Dry									
11:15	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.00 gal.

NOTES The well went dry; sample recharge

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-25	ROUND NO.	2
SAMPLE ID	OC-GW-25	SITE TYPE	Superfund	DATE	5/26/2015
TIME	START 8:05 END 8:57	JOB NUMBER	6107150016	BOTTLE TIME	8:45

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 5.26 FT.

WELL DEPTH (TOR): 11.30 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 5.59 FT.

SCREEN LENGTH: 3 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.03 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.66 GAL.

0.02

(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:10	5.59	160	13.25	0.886	6.10	7.34	1.87	-38	~ 10 ft.	
8:15	5.59	160	12.91	0.889	6.49	3.27	1.51	-109		
8:20	5.59	160	12.65	0.841	6.75	1.66	1.44	-149		
8:25	5.59	160	12.78	0.816	6.68	0.88	1.29	-147		
8:30	5.59	160	12.90	0.811	6.56	0.72	1.19	-140		
8:35	5.59	160	12.96	0.807	6.47	0.54	1.17	-134		
8:40	5.59	160	13.01	0.804	6.40	0.53	1.09	-129		
8:45	5.59	160	13.04	0.804	6.38	0.51	1.56	-127		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.66 gal.

NOTES

SIGNATURE: Ch Mh for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-34SR	ROUND NO.	2
SAMPLE ID	OC-GW-34SR	SITE TYPE	Superfund	DATE	5/28/2015
TIME	START 9:10 END 9:55	JOB NUMBER	6107150016	BOTTLE TIME	9:45

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 7.19 FT.

WELL DEPTH (TOR): 17.27 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 7.19 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP		X	
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.00 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.00

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.64 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:15	7.19	180	21.53	0.046	5.46	3.73	5.99	153	~ 15 ft.	
9:20	7.19	180	21.32	0.044	5.51	1.63	4.71	160		
9:25	7.19	180	20.85	0.040	5.64	1.19	4.90	164		
9:30	7.19	180	20.37	0.038	5.69	1.12	2.12	168		
9:40	7.19	180	20.20	0.038	5.68	1.11	1.84	172		
9:45	7.19	180	20.14	0.038	5.68	1.14	1.79	174		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.64 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	OC-GW-34D	ROUND NO.	2
SAMPLE ID	OC-GW-34D	SITE TYPE	Superfund	DATE	5/28/2015
TIME	START 8:05 END 9:05	JOB NUMBER	6107150016	BOTTLE TIME	8:45

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: DUP/ MS/ MSD

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 8.44 FT.

WELL DEPTH (TOR): 35.01 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 8.44 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.00 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.00

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.67 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:10	8.44	160	23.48	0.125	5.89	3.31	8.12	96	~ 32 ft.	
8:15	8.44	160	21.79	0.120	6.05	2.29	6.19	82		
8:20	8.44	160	20.29	0.112	6.17	1.46	4.88	75		
8:25	8.44	160	20.80	0.109	6.24	0.73	4.27	74		
8:30	8.44	160	20.74	0.109	6.24	0.64	2.14	75		
8:35	8.44	160	20.64	0.108	6.23	0.53	2.42	76		
8:40	8.44	160	20.67	0.108	6.23	0.49	2.74	76		
8:45	8.44	160	20.57	0.108	6.23	0.46	2.14	76		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.67 gal.

NOTES

DUP/ MS/ MSD

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-35S	ROUND NO.	2
SAMPLE ID	OC-GW-35S	SITE TYPE	Superfund	DATE	5/28/2015
TIME	START 10:50 END 11:28	JOB NUMBER	6107150016	BOTTLE TIME	11:15

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 7.49 FT.

WELL DEPTH (TOR): 19.52 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 7.65 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.026 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.026

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.00 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:55	7.65	150	23.68	0.779	6.64	2.76	6.32	-136	~ 17 ft.	
11:00	7.65	150	23.93	0.760	6.57	1.46	9.29	-144		
11:05	7.65	150	24.08	0.732	6.52	0.88	7.69	-157		
11:10	7.65	150	23.51	0.732	6.51	0.87	7.92	-158		
11:15	7.65	150	23.86	0.731	6.51	0.86	7.81	-159		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.0 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-43SR	ROUND NO.	2
SAMPLE ID	OC-GW-43SR	SITE TYPE	Superfund	DATE	6/3/2015
TIME	START 9:15 END 9:50	JOB NUMBER	6107150016	BOTTLE TIME	9:40

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 6.26 FT.

WELL DEPTH (TOR): 17.62 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 6.26 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.00 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.00

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.30 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:20	6.26	200	12.82	0.857	4.75	2.92	4.01	188	~ 16 ft.	
9:25	6.26	200	12.45	0.861	4.75	0.75	2.82	217		
9:30	6.26	200	12.49	0.861	4.75	0.58	1.85	226		
9:35	6.26	200	12.50	0.861	4.75	0.54	1.65	231		
9:40	6.26	200	12.52	0.861	4.75	0.50	1.03	233		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.30 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-76S	ROUND NO.	2
SAMPLE ID	OC-GW-76S	SITE TYPE	Superfund	DATE	5/26/2015
TIME	START 9:10 END 9:57	JOB NUMBER	6107150016	BOTTLE TIME	9:50

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 7.41 FT.

WELL DEPTH (TOR): 15.08 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 7.43 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP		X	
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.77 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:15	7.43	170	15.33	0.244	6.45	13.93	179	-9	~ 12 ft.	
9:20	7.43	170	16.75	0.208	6.18	2.10	112	22		
9:25	7.43	170	15.33	0.180	6.11	1.10	49.0	44		
9:30	7.43	170	15.54	0.170	6.07	0.63	66.7	50		
9:35	7.43	170	15.91	0.161	6.06	0.41	39.9	67		
9:40	7.43	170	16.23	0.156	6.04	0.34	41.6	85		
9:45	7.43	170	16.44	0.151	6.04	0.34	38.3	93		
9:50	7.43	170	16.50	0.150	6.04	0.28	39.2	92		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.77 gal.

NOTES

SIGNATURE: Ch Mu for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

amec foster wheeler

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-78S	ROUND NO.	2
SAMPLE ID	OC-GW-78S	SITE TYPE	Superfund	DATE	5/19/2015
TIME	START 9:50 END 10:30	JOB NUMBER	6107150016	BOTTLE TIME	12:20

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 4.45 FT.

WELL DEPTH (TOR): 10.27 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 4.80 FT.

SCREEN LENGTH: 9 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.056 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.05 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

0.05

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:55	4.78	135	12.26	1.05	6.53	5.14	18.1	18	~ 8 ft.	
10:00	4.79	135	11.73	1.05	6.46	3.07	11.2	17		
10:05	4.80	135	11.00	1.06	6.41	0.90	6.53	17		
10:10	4.80	135	10.77	1.06	6.39	0.67	1.62	22		
10:15	4.80	135	10.73	1.06	6.37	0.50	1.21	24		
10:20	4.80	135	10.71	1.06	6.35	0.47	1.07	25		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.05 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-79S	ROUND NO.	2
SAMPLE ID	OC-GW-79S	SITE TYPE	Superfund	DATE	5/19/2015
TIME	START 8:05 END 8:47	JOB NUMBER	6107150016	BOTTLE TIME	8:40

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 3.81 FT.

WELL DEPTH (TOR): 11.23 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 3.93 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.019 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.014

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.37 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:10	3.93	150	17.04	2.19	5.98	2.63	33.7	-33	~ 9 ft.	
8:15	3.93	150	15.66	2.12	5.95	1.06	68.8	-43		
8:20	3.93	150	15.30	2.13	5.94	0.93	75.3	-44		
8:25	3.93	150	14.70	2.14	5.91	0.70	72.8	-44		
8:30	3.93	150	13.99	2.15	5.88	0.50	37.8	-45		
8:35	3.93	150	13.72	2.16	5.87	0.48	34.5	-45		
8:40	3.93	150	13.57	2.16	5.87	0.44	31.7	-45		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.37 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-201S	ROUND NO.	2
SAMPLE ID	OC-GW-201S	SITE TYPE	Superfund	DATE	6/3/2015
TIME	START 10:15 END 10:55	JOB NUMBER	6107150016	BOTTLE TIME	10:45

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 3.49 FT.

WELL DEPTH (TOR): 14.94 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 3.71 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.035 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.13 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

0.03

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:20	3.71	145	14.07	3.43	6.27	3.46	2.97	59	~ 12 ft.	
10:25	3.71	145	14.00	2.92	6.25	1.60	3.62	51		
10:30	3.71	145	13.80	2.53	6.21	0.80	3.98	50		
10:35	3.71	145	13.64	2.46	6.19	0.51	3.39	48		
10:40	3.71	145	13.56	2.46	6.19	0.48	3.02	46		
10:45	3.71	145	13.53	2.46	6.19	0.47	2.97	46		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.13 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-202S	ROUND NO.	2
SAMPLE ID	OC-GW-202S	SITE TYPE	Superfund	DATE	5/18/2015
TIME	START 9:55 END 10:30	JOB NUMBER	6107150016	BOTTLE TIME	10:30

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 6.45 FT.

WELL DEPTH (TOR): 13.22 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 6.49 FT.

SCREEN LENGTH: 5 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.55 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:00	6.49	170	12.83	0.758	6.32	11.09	5.85	13	~ 11 ft.	
10:05	6.49	170	12.30	0.754	6.10	1.32	3.01	62		
10:10	6.49	170	11.99	0.760	6.09	1.17	3.03	64		
10:15	6.49	170	12.51	0.750	6.08	0.71	1.56	68		
10:20	6.49	170	12.37	0.757	6.08	0.57	0.92	69		
10:25	6.49	170	11.99	0.757	6.08	0.50	0.87	66		
10:30	6.49	170	12.01	0.758	6.09	0.48	0.55	66		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.55 gal.

NOTES

SIGNATURE: Ch Mh for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-202D	ROUND NO.	2
SAMPLE ID	OC-GW-202D	SITE TYPE	Superfund	DATE	5/18/2015
TIME	START 10:40 END 11:50	JOB NUMBER	6107150016	BOTTLE TIME	11:15

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: DUP/ MS/ MSD

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 5.87 FT.

WELL DEPTH (TOR): 23.7 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 5.98 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.017 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.50 GAL.

0.01

(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:45	5.98	165	13.82	4.26	4.78	10.83	9.74	180	~ 20 ft.	
10:50	5.98	165	13.24	4.70	4.71	1.03	9.57	196		
10:55	5.98	165	13.05	4.69	4.73	0.70	7.12	197		
11:00	5.98	165	13.07	4.65	4.75	0.50	8.03	198		
11:05	5.98	165	12.90	4.63	4.76	0.43	3.03	199		
11:10	5.98	165	12.95	4.59	4.77	0.39	2.93	200		
11:15	5.98	165	12.90	4.59	4.77	0.36	2.53	200		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.5 gal.

NOTES

DUP/MS/MSD

SIGNATURE: Ch for Ol.n

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	MP-2#13	ROUND NO.	2
SAMPLE ID	OC-MP2#13	SITE TYPE	Superfund	DATE	6/3/2015
TIME	START 8:10 END 9:10	JOB NUMBER	6107150016	BOTTLE TIME	9:00

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: N/A FT.

WELL DEPTH (TOR): 13.5 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: multi-port IN.

FINAL DEPTH TO WATER: N/A FT.

SCREEN LENGTH: multi-port FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.95 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:20	-	150	12.30	1.56	4.55	6.70	1.50	131	~ 13.5 ft.	Multi-port well
8:25	-	150	12.24	1.56	4.56	2.28	1.45	129		
8:30	-	150	12.28	1.56	4.55	1.46	1.67	129		
8:35	-	150	12.25	1.55	4.51	1.01	0.81	132		
8:40	-	150	12.28	1.55	4.49	0.87	0.60	133		
8:45	-	150	12.34	1.55	4.47	0.75	0.67	134		
8:50	-	150	12.30	1.55	4.45	0.69	1.11	135		
8:55	-	150	12.30	1.54	4.45	0.68	0.81	139		
9:00	-	150	12.26	1.54	4.45	0.69	0.83	136		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.95 gal.

NOTES MP-2 #13 replaces GW-42S

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

amec foster wheeler

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-CA1	ROUND NO.	2
SAMPLE ID	OC-GW-CA1	SITE TYPE	Superfund	DATE	5/28/2015
TIME	START 10:00 END 10:40	JOB NUMBER	6107150016	BOTTLE TIME	10:30

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 7.01 FT.

WELL DEPTH (TOR): 9.27 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 7.01 FT.

SCREEN LENGTH: 5 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.00 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.44 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

0.00

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:05	7.01	185	22.07	0.316	6.62	2.07	3.39	18	~ 8 ft.	
10:10	7.01	185	18.61	0.329	6.61	1.47	3.42	32		
10:15	7.01	185	17.67	0.333	6.61	1.12	1.68	49		
10:20	7.01	185	17.42	0.333	6.60	0.88	0.87	66		
10:25	7.01	185	17.42	0.333	6.60	0.81	1.23	73		
10:30	7.01	185	17.44	0.333	6.60	0.79	1.19	74		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.44 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

amec foster wheeler

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-16RR	ROUND NO.	2
SAMPLE ID	OC-PZ-16RR	SITE TYPE	Superfund	DATE	5/19/2015
TIME	START 8:50 END 9:35	JOB NUMBER	6107150016	BOTTLE TIME	9:00

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 3.48 FT.

WELL DEPTH (TOR): 5.23 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 0.75 IN.

FINAL DEPTH TO WATER: Dry FT.

SCREEN LENGTH: 1 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP		X	
CASING	X		
LOCKED		X	
COLLAR		X	

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 0.07 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:55	--	--	13.09	2.02	7.18	8.14	153.0	-190	~ 5 ft.	
	Well dry									
	Sample recharge									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES NO

NUMBER OF GALLONS GENERATED: ~ 0.07 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-17RRR	ROUND NO.	2
SAMPLE ID	OC-PZ17RRR	SITE TYPE	Superfund	DATE	5/19/2015
TIME	START 10:40 END 11:20	JOB NUMBER	6107150016	BOTTLE TIME	10:55

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 2.35 FT.

WELL DEPTH (TOR): 6.85 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 0.75 IN.

FINAL DEPTH TO WATER: Dry FT.

SCREEN LENGTH: 1 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP		X	
CASING	X		
LOCKED		X	
COLLAR		X	

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 0.18 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

N/A

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:45	--	--	13.86	0.911	7.44	3.58	135	-205	~ 5 ft.	
	Well dry									
	Sample recharge									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 0.18 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-18R	ROUND NO.	2
SAMPLE ID	OC-PZ-18R	SITE TYPE	Superfund	DATE	6/3/2015
TIME	START 11:00 END 12:35	JOB NUMBER	6107150016	BOTTLE TIME	11:35

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 1.84 FT.

WELL DEPTH (TOR): 5.96 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1 IN.

FINAL DEPTH TO WATER: 2.75 FT.

SCREEN LENGTH: 1.6 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED		X	
COLLAR		X	

DRAWDOWN VOLUME: 0.036 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.00 GAL.

0.036

(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
11:05	2.75	110	13.28	5.83	6.54	6.97	61.3	-152	~ 5 ft.	
11:10	2.75	110	13.31	5.95	6.53	3.23	40.2	-149		
11:15	2.75	110	13.37	6.13	6.46	1.80	15.9	-128		
11:20	2.75	110	13.38	6.12	6.44	1.54	8.2	-118		
11:25	2.75	110	13.45	6.09	6.40	1.14	4.4	-110		
11:30	2.75	110	13.47	6.09	6.39	1.13	3.6	-108		
11:35	2.75	110	13.48	6.08	6.39	1.12	3.4	-107		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.0 gal.

NOTES

SIGNATURE: [signature]

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-24	ROUND NO.	2
SAMPLE ID	OC-PZ-24	SITE TYPE	Superfund	DATE	5/18/2015
TIME	START 8:50 END 9:33	JOB NUMBER	6107150016	BOTTLE TIME	9:25

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 8.74 FT.

WELL DEPTH (TOR): 17.59 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 8.77 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.37 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:55	8.77	150	11.87	1.97	6.17	4.43	17.5	-93	~ 16 ft.	
9:00	8.77	150	11.91	1.97	6.16	2.06	11.7	-96		
9:05	8.77	150	11.70	1.97	6.18	0.87	8.17	-100		
9:10	8.77	150	11.74	1.95	6.21	0.70	5.01	-101		
9:15	8.77	150	11.73	1.95	6.24	0.51	3.36	-103		
9:20	8.77	150	11.70	1.94	6.25	0.43	3.42	-107		
9:25	8.77	150	11.76	1.93	6.25	0.44	3.70	-106		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.37 gal.

NOTES

SIGNATURE: Ch Mh for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

amec foster wheeler

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-25	ROUND NO.	2
SAMPLE ID	OC-PZ-25	SITE TYPE	Superfund	DATE	5/18/2015
TIME	START 8:00 END 8:47	JOB NUMBER	6107150016	BOTTLE TIME	8:40

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 8.35 FT.

WELL DEPTH (TOR): ~ 17.70 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 8.36 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.51 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:05	8.36	145	12.82	1.08	6.22	2.64	2.58	-20	~ 16 ft.	
8:10	8.36	145	12.73	1.12	6.24	1.87	2.32	-32		
8:15	8.36	145	12.32	1.14	6.25	1.84	1.77	-36		
8:20	8.36	145	12.20	1.15	6.25	1.45	1.55	-39		
8:25	8.36	145	12.90	1.16	6.25	1.21	1.47	-39		
8:30	8.36	145	11.78	1.17	6.25	1.07	1.72	-37		
8:35	8.36	145	11.50	1.18	6.25	1.02	1.84	-37		
8:40	8.36	145	11.49	1.18	6.25	1.04	1.74	-38		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.51 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

amec foster wheeler

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-16R	ROUND NO.	2
SAMPLE ID	OC-GW-16R	SITE TYPE	Superfund	DATE	5/27/2015
TIME	START 7:40 END 9:05	JOB NUMBER	6107150016	BOTTLE TIME	8:35

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 11.33 FT.

WELL DEPTH (TOR): 17.17 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 11.78 FT.

SCREEN LENGTH: 5 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.07 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 2.00 GAL.

0.035

(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
7:50	11.78	140	22.16	0.233	5.99	7.17	75.8	81	~ 15 ft.	
7:55	11.78	140	20.45	0.185	6.23	1.92	53.9	-25		
8:00	11.78	140	19.63	0.177	6.28	1.67	93.3	-30		
8:05	11.78	140	18.60	0.172	6.29	1.54	79.0	-36		
8:10	11.78	140	18.50	0.168	6.27	1.25	70.3	-38		
8:15	11.78	140	18.74	0.166	6.26	1.16	62.2	-38		
8:20	11.78	140	18.70	0.166	6.26	1.07	40.1	-41		
8:25	11.78	140	18.21	0.167	6.25	0.94	29.9	-41		
8:30	11.78	140	18.23	0.167	6.25	0.93	31.5	-40		
8:35	11.78	140	18.19	0.167	6.25	0.92	28.9	-40		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[X] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[X] VOCs
[X] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[X] SVOCs
[X] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[X] VPH
[X] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Fe
[X] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[X] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[ ] Chloride	300.0	4 DEG. C	1 X 500 mL	[ ] Chloride
[ ] Sulfate	300.0	4 DEG. C	1 X 500 mL	[ ] Sulfate
[ ] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[ ] Specific Conductivity
[ ] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 2.0 gal.

NOTES

SIGNATURE: Ch Mh for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 5/27/2015
FIELD SAMPLE ID: OC-SW-ISCO1
ACTIVITY TIME: START 11:25 END 11:35
BOTTLE TIME: 11:30
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION: 1.2 ft.
SPEC. COND: 0.966 mS/cm
DEPTH OF SAMPLE FROM SURFACE: 0.58 ft.
D.O.: 2.12 mg/L
TEMPERATURE: 19.74 DEG C
SALINITY: --- %
TURBIDITY: 16.50 NTU
ORP: 30 mV
pH: 5.92 UNITS

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [ ] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [X] OTHER: Weir Area

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]
SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

ANALYTICAL PARAMETERS

	SURFACE WATER	METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS

	SEDIMENT	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

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SIGNATURE: [signature] for Olin

Sampled by: BEG
Prepared by: LCG
Checked by: CTM

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 5/27/2015
FIELD SAMPLE ID: OC-SW-ISCO2
ACTIVITY TIME: START 9:50 END 10:00
BOTTLE TIME: 9:55
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.25 ft.	SPEC. COND	1.96 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.13 ft.	D.O.	5.09 mg/L
TEMPERATURE	20.93 DEG C	SALINITY	--- %
TURBIDITY	80.80 NTU	ORP	-27 mV
pH	6.54 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

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SIGNATURE: [signature] for Olin

Sampled by: BEG
Prepared by: LCG
Checked by: CTM

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 5/27/2015
FIELD SAMPLE ID: OC-SW-ISCO3
ACTIVITY TIME: START 9:35 END 9:45
BOTTLE TIME: 9:40
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.25 ft.	SPEC. COND	0.812 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.13 ft.	D.O.	6.92 mg/L
TEMPERATURE	21.53 DEG C	SALINITY	--- %
TURBIDITY	2.20 NTU	ORP	-21 mV
pH	6.59 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [X] NONE

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

amec foster wheeler

SIGNATURE: [signature] for Olin

Sampled by: BEG
Prepared by: LCG
Checked by: CTM

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 5/27/2015
FIELD SAMPLE ID: OC-SW-PZ16RR
ACTIVITY TIME: START 10:10 END 10:20
BOTTLE TIME: 10:15
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION: 0.33 ft.
SPEC. COND: 0.564 mS/cm
DEPTH OF SAMPLE FROM SURFACE: 0.17 ft.
D.O.: 6.15 mg/L
TEMPERATURE: 22.96 DEG C
SALINITY: --- %
TURBIDITY: 193.00 NTU
ORP: -27 mV
pH: 6.65 UNITS

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]
SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

ANALYTICAL PARAMETERS

SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS

SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

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SIGNATURE: [signature] for Olin

Sampled by: BEG
Prepared by: LCG
Checked by: CTM

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 5/27/2015
FIELD SAMPLE ID: OC-SW-PZ17RRR
ACTIVITY TIME: START 10:25 END 10:35
BOTTLE TIME: 10:30
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION: 0.50 ft.
SPEC. COND: 1.420 mS/cm
DEPTH OF SAMPLE FROM SURFACE: 0.25 ft.
D.O.: 6.16 mg/L
TEMPERATURE: 17.14 DEG C
SALINITY: --- %
TURBIDITY: 18.1 NTU
ORP: 1 mV
pH: 6.02 UNITS

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]
SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____
CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	SURFACE WATER	METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS

	SEDIMENT	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

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SIGNATURE: [signature] for Olin

Sampled by: BEG
Prepared by: LCG
Checked by: CTM

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 5/27/2015
FIELD SAMPLE ID: OC-SW-PZ18R
ACTIVITY TIME: START 10:50 END 11:20
BOTTLE TIME: 10:55
QC SAMPLES COLLECTED: NA

SURFACE WATER DATA

WATER DEPTH AT LOCATION	1.0 ft.	SPEC. COND	0.951 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.5 ft.	D.O.	2.09 mg/L
TEMPERATURE	20.09 DEG C	SALINITY	--- %
TURBIDITY	19.00 NTU	ORP	19 mV
pH	5.94 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [ ] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [X] OTHER: Weir Area

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

amec foster wheeler

SIGNATURE: Ch m for Olin

Sampled by: BEG
Prepared by: LCG
Checked by: CTM

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 5/27/2015
FIELD SAMPLE ID: OC-SW-SD17
ACTIVITY TIME: START 10:40 END 10:50
BOTTLE TIME: 10:45
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.42 ft.	SPEC. COND	1.410 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.21 ft.	D.O.	4.96 mg/L
TEMPERATURE	17.46 DEG C	SALINITY	--- %
TURBIDITY	56.80 NTU	ORP	4 mV
pH	6.01 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

amec foster wheeler

SIGNATURE: Chris Mc for Olin

Sampled by: BEG
Prepared by: LCG
Checked by: CTM

APPENDIX B

Chains of Custody

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-67682-12962.1
Client Contact: Mr. Brian Guichard	Phone: 9786586171	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 2
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days):			
State, Zip: MA, 01887				
Phone: 423-336-4012(Tel)	PO #: REWI0025			
Email: beguichard@olin.com	WO #:			
Project Name: Groundwater Quarterly Event Desc: Groundwater Quarterly (May	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

480-80840 Chain of Custody

Preservation Codes:
A - HCL
B - NaOH
C - Zn Acetate
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	350.1 - Ammonia	6010MCP - Al/Cr Dissolved Field filtered	2510B - Specific Conductance	Total Number of co	Special Instructions/Note:
			Preservation Code:				N	S	D	N		
OC-GW-202S	5-18-15	10:30	G	Water	✓		✓	✓	✓	✓	4	
OC-GW-202D	5-18-15	11:15	G	Water	✓		✓	✓	✓	✓	4	
~~OC-GW-25~~				~~Water~~								
OC-GW-78S	5-19-15	10:20	G	Water	✓		✓	✓	✓	✓	4	
OC-GW-79S	5-19-15	8:40	G	Water	✓		✓	✓	✓	✓	4	
OC-PZ-16RR	5-19-15	9:00	G	Water	✓		✓	✓	✓	✓	4	
OC-PZ-17RR R	5-19-15	10:55	G	Water	✓		✓	✓	✓	✓	4	
~~OC-PZ-18R~~				~~Water~~								
OC-PZ-24	5-18-15	9:25	G	Water	✓		✓	✓	✓	✓	4	
OC-PZ-25	5-18-15	8:40	G	Water	✓		✓	✓	✓	✓	4	
OC-DUP GW 202 D	5-18-15	11:15	G	Water	✓		✓	✓	✓	✓	4	

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	5-21-15			5-21-15 1230	TA
	5-21-15 1800			22MAY15 0245	TAD

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.7 #1

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-67682-12962.2
Client Contact: Mr. Brian Guichard	Phone: 9786586121	E-Mail: becky.mason@testamericainc.com		Page: Page 2 of 2
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days):			
State, Zip: MA, 01887				
Phone: 423-336-4012(Tel)	PO #: REWI0025			
Email: beguichard@olin.com	WO #:			
Project Name: Groundwater Quarterly Event Desc: Groundwater Quarterly (May	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	350.1 - Ammonia	6010MCP - Al/Cr Dissolved Field filtered	2510B - Specific Conductance	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	N		
OC-GW202D MS	5-18-15	11:15	G	Water	✓		✓	✓	✓	✓	4	
OC-GW202D MSD	5-18-15	11:15	G	Water	✓		✓	✓	✓	✓	4	
				Water								

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	5-21-15			5-21-15 1220	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	5-21-15 1800	TA		22May15 0245	TAB
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.7 #1

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Gilchrist	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-67685-8585.2
Client Contact: Mr. James Cashwell	Phone: 937 865 8612	E-Mail: becky.mason@testamericainc.com		Page: Page 2 of 2
Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested:			
City: Charleston	TAT Requested (days):			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0025			
Email: jmcashwell@olin.com	WO #:			
Project Name: Groundwater SemiAnnual Event Desc: Groundwater Semi-annu	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	350.1 - Ammonia	6010MCP - Al/Cr Dissolved Field filtered	2510B - Specific Conductance	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	N		
GW 201S	6-3-15	10:45										
MP 13	6-3-15	9:00										
OC PZ 18R	6-3-15	11:35										
OC CA1	5-28-15	10:30										
OC GW24	5-26-15	11:15										
OC GW 43SR	6-3-15	9:40										
OC GW 35S	5-28-15	11:15										
OC GW 76S	5-26-15	9:50										

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	6-4-15			6-4-15 1200	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	6-4-15 1200			05 Jun 15 0135	TAO
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: #1

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-67685-8585.1
Client Contact: Mr. James Cashwell	Phone: 9786586121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 2
Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested:			
City: Charleston	TAT Requested (days):			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0025			
Email: jmcashwell@olin.com	WO #:			
Project Name: Groundwater SemiAnnual Event Desc: Groundwater Semi-annau	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	350.1 - Ammonia	6010MCP - Al/Cr Dissolved Field filtered	2510B - Specific Conductance	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	N		
OC GW 25	5-26-15	8:45										
OC GW 34D	5-28-15	8:45										
OC GW 34D MS	5-28-15	8:45										
OC GW 34D MSD	5-28-15	8:45										
OC GW 34D DUP	5-28-15	8:45										
OC GW 34SR	5-28-15	9:45										

480-81625 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	6-4-15		[signature]	6-4-15 1200	TA
[signature]	6-4-15 1700	TA	[signature]	05 June 15 0135	TAB

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.8, 0.6 #1

6/18/2015

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-67683-12963.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days):			
State, Zip: MA, 01887				
Phone: 423-336-4012(Tel)	PO #: REWI0025			
Email: beguichard@olin.com	WO #:			
Project Name: Surfacwater Quarterly Event Desc: Surfacewater Quarterly (May/	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	350.1 - Ammonia	6010MCP - Al/Cr/Na Total	6010MCP - Al/Cr/Na Dissolved Field Filtered	2510B, 353.2, 353.2_Nitrite, Nitrate_Calc	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	D	N		
OC-ISCO1	5-27-15	11:30	G	Water	✓		✓	✓	✓	✓	✓	5	
OC-ISCO2		9:55		Water	✓		✓	✓	✓	✓	✓	5	
OC-ISCO3		9:40		Water	✓		✓	✓	✓	✓	✓	5	
OC-PZ-16RRSW		10:15		Water	✓		✓	✓	✓	✓	✓	5	
OC-PZ-~~17RRSW~~ 17RRRSW		10:30		Water	✓		✓	✓	✓	✓	✓	5	
OC-PZ-18RSW		10:55		Water	✓		✓	✓	✓	✓	✓	5	
OC-SD-17		10:45		Water	✓		✓	✓	✓	✓	✓	5	
OC-DUP SW PZ18RSW		10:55		Water	✓	✓	✓	✓	✓	✓	✓	5	
OC-~~PZ18RSW~~ MS		10:55		Water	✓	✓	✓	✓	✓	✓	✓	5	
OC-~~PZ18RSW~~ MSD		10:55		Water	✓	✓	✓	✓	✓	✓	✓	5	
				Water									

480-81082 Chain of Custody

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Brian Guichard	5-27-15			5-27-15 1250	TB
	5-27-15 1800	TB		28 MAY 15 0230	TAB

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.8, 0.6 #1

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-67680-12290.1
Client Contact: Mr. Brian Guichard	Phone: 9786586121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days):			
State, Zip: MA, 01887				
Phone: 423-336-4012(Tel)	PO #: REWI0025			
Email: beguichard@olin.com	WO #:			
Project Name: Plant B Quarterly Event Desc: Plant B quarterly(March/May/Augu	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 - Ammonia	6010MCP - Iron	MAVPH - MA VPH	8260MCP - TMP 8260	8270_LL_MCP - NDPA/BEHP 8270LL	SM4500_H+ - pH	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	D	A	A	N	N		
OC-GW-16R	5-27-15	8:35	G	Water	✓		✓	✓	✓	✓	✓	✓	11	

480-81081 Chain of Custody

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Brian Guichard	5-27-15			5-27-15 1250	TA
	5-27-15 1800	TA		28MAY15 0230	TAB

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.9 #1

APPENDIX C

Second Quarter 2015
Temporary Cap Inspection Photo Log

Photo 1: General Cap Photo (looking northeast)

Photo 2: Vegetation Growth (northeast section of the cap)

Photo 3: Significant Tear (needs repair)

Photo 4: Drainage Grate

APPENDIX A

Interim Response Steps Field Activity Reports

A-2 Third Quarter 2015 Sampling Event

INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT
THIRD QUARTER 2015 SAMPLING EVENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT
THIRD QUARTER 2015 SAMPLING EVENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

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December 21, 2015

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Appendix C Third Quarter 2015 Temporary Cap Inspection Photo Log

GLOSSARY OF ACRONYMS

AMEC	AMEC Environment & Infrastructure, Inc.
Amec Foster Wheeler	Amec Foster Wheeler Environment and Infrastructure, Inc.
DO	Dissolved Oxygen
IRSWP	Interim Response Steps Work Plan
LNAPL	Light Non-Aqueous Phase Liquid
MACTEC	MACTEC Engineering and Consulting, Inc.
NTU	Nephelometric Turbidity Units
ORP	Oxidation/Reduction Potential
RI/FS	Remedial Investigation/Feasibility Study
SC	Specific Conductivity
TAL	TestAmerica Laboratories, Inc.
USEPA	United States Environmental Protection Agency
UV	Ultraviolet

1.0 INTRODUCTION

On behalf of the Olin Corporation (Olin), Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler (formerly AMEC)) presents this summary report for field activities completed in association with the Third Quarter 2015 groundwater and surface water monitoring and the cap inspection for the Slurry Wall/Cap Monitoring Program and the Plant B Monitoring Program. These activities were conducted consistent with the requirements and procedures contained in the Final Interim Response Steps Work Plan (IRSWP), Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts dated August 8, 2008 and the Volume IIIB, the Quality Assurance Project Plan, of the Final Remedial Investigation/Feasibility Study (RI/FS) Work Plan dated August 14, 2009 (MACTEC Engineering and Consulting, Inc. [MACTEC], 2009).

1.1 Limitations

This report, including its findings, opinions, and conclusions, is intended for the exclusive use and benefit of, and may be relied upon only by Olin Corporation and the United States Environmental Protection Agency (USEPA).

2.0 SLURRY WALL/CAP MONITORING PROGRAM

The purpose of the Slurry Wall/Cap Monitoring Program is to monitor the concentrations of select constituents in groundwater and surface water in areas adjacent to and within the South Ditch and to monitor the physical condition of the temporary cap at the Containment Area of the former Olin Facility located at 51 Eames Street, Wilmington, Massachusetts.

The Third Quarter 2015 groundwater and surface water monitoring program includes collecting groundwater level measurements from select monitoring wells and piezometers, collecting and analyzing groundwater samples from five monitoring wells and five piezometers, and collecting and analyzing surface water samples from seven locations within the East Ditch and South Ditch. Groundwater and surface water sample locations are listed in **Table 1** and shown on **Figure 1**. The groundwater and surface water sampling program is further described in the Final IRSWP (MACTEC, 2008), which has been approved by the USEPA.

2.1 Scope of Work

The Slurry Wall/Cap Monitoring Program for this sampling event consists of: collecting groundwater level measurements in the vicinity of the South Ditch area; collecting and analyzing groundwater samples from the following monitoring wells: GW-25, GW-78S, GW-79S, GW-202S, and GW-202D; and piezometers: PZ-16RR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25; collecting and analyzing surface water samples from the following locations: ISCO-1, ISCO-2, ISCO-3, SD-17, PZ-16RR, PZ-17RRR, and PZ-18R; inspecting and documenting the condition of the temporary cap; and downloading water level and barometric pressure data from data loggers that have been installed in the following wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S. Monitoring wells, piezometers, and surface water sample locations are shown on **Figure 1**.

2.1.1 Groundwater Level Measurement

On August 18-19, 2015, Amec Foster Wheeler personnel completed a site reconnaissance of the monitoring well locations in the Slurry Wall/Cap Monitoring Program and collected groundwater level measurements. This included measuring depth to groundwater from 22 monitoring wells and piezometers using a water level meter. Groundwater level measurements and calculated groundwater elevations are summarized in **Table 2**.

2.1.2 Groundwater Sampling

On August 18, 2015, Olin personnel sampled groundwater from five monitoring wells and five piezometers using 2010 USEPA low stress (low flow) groundwater sampling methods.

Prior to low flow sampling, a YSI-556 water quality meter and a Hach 2100P turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions. The field instruments calibration records are contained in **Appendix A**. No readings were noted outside the manufacturer calibration ranges.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at each monitoring location. During sampling activities, the purged groundwater was continuously monitored using the multi-parameter water quality meter for pH, temperature, specific conductivity (SC), dissolved oxygen (DO), and oxidation/reduction potential (ORP), while turbidity was monitored using the Hach 2100P turbidity meter. Well purging continued at each location until these field parameters stabilized as indicated in Appendix A of the IRSWP.

No readings were noted outside the 2010 USEPA low flow stabilization guidelines. Monitoring locations PZ-16RR and PZ-17RRR went dry upon purging and could not be low flow sampled. Locations that draw down are typically purged dry and sampled upon recharging. The final low flow purging field parameter measurements are presented in **Table 3**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon stabilization of groundwater parameters, groundwater samples were collected by directly filling the laboratory prepared sample bottles. A 0.45-micron pore diameter, in-line Teflon™ filter was used to field filter groundwater for dissolved metal analysis in accordance with the IRSWP. The samples were placed on ice and transferred to TestAmerica Laboratories, Inc. (TAL) of Westfield, Massachusetts, under chain-of-custody for chemical analyses as summarized in **Table 4**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the January 2016 Semi-Annual Status Report.

Purged groundwater from each monitoring well was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

2.1.3 Surface Water Sampling

On August 19, 2015, Amec Foster Wheeler collected seven surface water samples from downstream to upstream from the East Ditch and South Ditch. The locations are identified as ISCO-3, ISCO-2, PZ-16RR, PZ-17RRR, SD-17, PZ-18R, and ISCO-1 as shown on **Figure 1**.

Before field activities began, a YSI-556 water quality meter and Hach 2100P turbidity meter was properly calibrated to monitor surface water quality parameters at each location. The calibration records can be found in **Appendix A**. No readings were noted outside the manufacturer calibration ranges.

At each of the seven field locations, surface water parameter measurements (pH, temperature, SC, ORP, DO, and turbidity) were collected. Readings were collected by directly submersing the YSI probe into the surface water until parameter stabilization. The final surface water field parameters are summarized in **Table 5**. Field data records from each surface water sample location are attached in **Appendix A**.

Filtered surface water samples (for dissolved metals analysis) were collected by submerging dedicated tubing attached to a peristaltic pump into the water (approximately from 0.15 feet to 0.5 feet into the surface water). A peristaltic pump was used to reduce the entrapment of floating or suspended sediment and provide positive pressure for field filtering the water through the 0.45-micron pore diameter filter for dissolved metal analysis.

Surface water samples were collected by directly filling the laboratory prepared glassware. The samples were then placed on ice for delivery to TAL of Westfield, Massachusetts, under chain-of-custody for chemical analyses summarized in **Table 6**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the January 2016 Semi-Annual Status Report.

2.1.4 Data Logger Data Download

Data loggers are deployed in 10 monitoring wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S, to continuously monitor groundwater elevation proximate to the cap area. Amec Foster Wheeler

downloaded data from the 10 data loggers, along with data from the barometric pressure data logger deployed in GW-35S. Downloaded data from the loggers are presented in the January 2016 Semi-Annual Status Report.

2.1.5 Cap Inspection

The temporary cap is composed of ten large and three small scrim reinforced polyethylene sheets of 8 mil thickness (**Figure 2**). These sheets were factory fabricated with double welded seams from smaller, narrower panels. The seams between the large sheets were field fabricated by folding and sewing the edges of the sheets together with an ultraviolet (UV) -resistant thread. The original temporary cap was installed in 2001 and consisted of a 6 mil thick sheet. Due to deterioration of the 6 mil sheet, it was replaced by the current 8 mil thick cover in 2003. The 8 mil cover was placed directly over the 6 mil cover and re-ballasted with sand bags to resist wind uplift. Quarterly inspections of the 8 mil cover were instituted in 2003 to evaluate the need for periodic maintenance and to document maintenance and repair activities. Since that time Olin has replaced sections of the temporary cap sheeting damaged due to wind up lift on May 7, 2012 and April 30, 2013.

On August 20, 2015, Amec Foster Wheeler field personnel performed a visual inspection of the Temporary Cap surface. Photographs taken during the inspection are presented in **Appendix C**. In general, the temporary cap was observed to be in good condition and repairs previously completed by Olin personnel were intact. Major repairs (replacement / re-stitching of several cap panels, replacing and adding sandbags; and adding ballast along the perimeter) to the cap also appear to be in good condition. The temporary cap surface contains some sediment from previously deteriorated sand bags, small areas of vegetation, small areas of water, some minor fraying to the edges of some sheets that do not compromise the welded seams, and some minor perforations. However, a large tear in the top layer of the cap was noted in the northeast section of the cap just west of monitoring wells GW-CA3S and GW-CA3D. Amec Foster Wheeler's observations are summarized in **Figure 2**. Temporary cap monitoring activities are summarized below.

2.1.5.1 Activities Completed During This Inspection

- Walking and inspecting the sewn seams for evidence of deterioration of the UV–resistant thread.
- Observing areas of sewn seams in low spots.
- Checking sand bags and other areas where vegetation is growing to verify the roots have not penetrated the polyethylene cover.
- Providing photo-documentation of typical cap conditions.

2.1.5.2 Observations During This Inspection

- The scrim reinforced polyethylene cover remains flexible and is generally in good condition; however, several areas were observed where the scrim reinforcement thread (within the polyethylene sheet) is showing signs of deterioration.
- Sewn seams utilizing UV-resistant thread are intact and do not show signs of deterioration.
- Amec Foster Wheeler observed several tears and perforations along cap surface. These locations were identified to the Olin on-Site manager for repair by Olin as part of normal maintenance.

- Several sandbags were observed to be not securely tied. Several other sand bags were ripped open or destroyed.
- Wild seeding from surrounding areas has resulted in vegetation growth from under some sand bags and low lying areas above the cap surface. The plant roots, where observed, do not appear to penetrate the underlying polyethylene sheet; however, it is recommended this vegetation be periodically removed.
- Several small areas and a few larger areas of standing water were observed on the cap surface, including around the main drain.
- A few locations where Olin site personnel have repaired perforations and minor damage to the cap need to be repaired again since the existing patches are starting to lift from the cap preventing a proper seal.
- The gravel ballast placed along the perimeter of the cap remains in place.
- Although some patches of vegetation surround the cap internal drain grate, they do not appear to impede the active draining of standing water from the cap surface. Some of the standing water around the drain grate does not appear to be flowing into the drain.
- Water was not observed between the two “cap” membranes east of the drainage grate.

2.1.5.3 Discussion

The general physical condition of the cap membrane and sewn seams appear in good condition considering its age and direct exposure to sunlight and the elements; however, some areas of the scrim reinforcement thread were observed to be deteriorating.

The areas of vegetation growth that exist above the cap surface do not appear to affect the polyethylene sheeting. The polyethylene sheet continues to perform its intended function as the UV protection provided by its carbon black content has protected the polymer from significant deterioration.

A large tear in the northeast portion of the cap was observed. The tear was large enough for wind to separate the two cap layers which could eventually lead to more or larger tears in the cap. This location was communicated to Olin.

Olin site personnel have repaired perforations and minor damage to the cap with a polyethylene repair tape with mastic backing. These repairs were generally observed to be in good condition, with only a few exceptions noted. Olin continues to repair locations observed by Amec Foster Wheeler that require resealing.

2.1.5.4 Recommendations

It is recommended that the current program of cap inspections and maintenance (including: patching the perforations, and tears noted during the cap inspection; inspecting the internal drain and removing vegetation within the drainage grate; removing vegetation growth from the cap; and visually monitoring the cap for future changes in condition) be continued.

3.0 PLANT B MONITORING PROGRAM

The purpose of the Plant B groundwater sampling and analysis program is to monitor groundwater quality at select monitoring wells and conduct gauging activities to determine groundwater elevations and light non-aqueous phase liquid (LNAPL) thickness.

3.1 Scope of Work

The Third Quarter Plant B Monitoring Program consisted of measuring groundwater levels in 28 monitoring wells within the Plant B area, gauging LNAPL thickness in monitoring wells where LNAPL was observed, and USEPA low stress (low flow) groundwater sampling at monitoring well GW-16R. Groundwater monitoring wells from the Plant B Monitoring Program are listed in **Table 7** and the monitoring well locations are shown on **Figure 3**.

3.1.1 Groundwater Level Measurements and LNAPL Gauging

On August 20, 2015, Olin personnel completed a site reconnaissance of the monitoring well locations in the Plant B Monitoring Program and collected groundwater level measurements and LNAPL thickness measurements. Depth to groundwater was measured in 28 monitoring wells using a water interface probe. For wells with observed LNAPL, LNAPL thickness was measured using an oil/water interface probe. Groundwater level measurements, groundwater elevations, and LNAPL thickness measurements are summarized in **Table 7**.

3.1.2 Groundwater Sampling

On August 19, 2015, Amec Foster Wheeler personnel sampled groundwater from monitoring well GW-16R following the 2010 USEPA low stress (low flow) groundwater sampling method.

Prior to low flow sampling, a YSI-556 water quality meter and Hach 2100P turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions. The field instrument calibration record is contained in **Appendix A**. A calibration check was also performed at the end of each day and is recorded on the calibration records. No readings were noted outside the manufacturer calibration ranges.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at the sample location. During sampling activities, the purged groundwater was continuously monitored using the YSI-556 multi-parameter water quality meter for pH, temperature, SC, DO, and ORP, while turbidity was monitored using the Hach 2100P turbidity meter. Well purging continued at the sample location until these field parameters stabilized as indicated in Appendix A of the IRSWP. No readings were noted outside the 2010 USEPA low flow stabilization guidelines. The final low flow purging field parameter measurements are presented in **Table 8**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon groundwater parameter stabilization, groundwater samples were collected by directly filling the laboratory prepared glassware. The samples were placed on ice, and were transferred to TAL of Westfield, Massachusetts, under chain-of-custody for chemical analyses as summarized in **Table 9**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the January 2016 Semi-Annual Status Report.

Purged groundwater from sampling activities was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

4.0 REFERENCES

MACTEC Engineering and Consulting, Inc. (MACTEC), August 8, 2008. *Final Interim Response Steps Work Plan*, Olin Chemical Superfund Site, Wilmington, Massachusetts.

MACTEC, August 14, 2009. Final RI/FS Work Plan, Olin Chemical Superfund Site, Wilmington, Massachusetts.

TABLES

Table 1
Groundwater and Surface Water Sampling Locations
Slurry Wall/Cap Monitoring Program
Third Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Groundwater	Surface Water
GW-25	ISCO1
GW-78S	ISCO2
GW-79S	ISCO3
GW-202S	PZ-16RR
GW-202D	PZ-17RRR
PZ-16RR	PZ-18R
PZ-17RRR #	SD-17
PZ-18R	
PZ-24	
PZ-25	
GW-16R ^	

Notes:
* - Well removed for detention basin construction
** - Well destroyed
# - Piezometer replaced in South Ditch
^ - Plant B Monitoring Well

Prepared by: CTM 09/11/2015
Checked by: LCG 11/24/2015

Table 2
Groundwater Elevations
Slurry Wall/Cap Monitoring Program
Third Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL ID	Reference Elevation	Depth to Water (1, 2)	Groundwater Elevation (3)	Notes	Date Measured
I.D.	(ft msl)	(ft)	(feet NGVD)		
GW-10S	89.10	9.23	79.87		8/18/2015
GW-24	83.43	3.08	80.35		8/18/2015
GW-25	85.97	5.60	80.37		8/18/2015
GW-26*	84.93	*	---		---
GW-34D	90.36	9.27	81.09		8/18/2015
GW-34SR	89.13	8.04	81.09		8/18/2015
GW-35S	88.51	7.95	80.56		8/18/2015
GW-39	83.64	4.85	78.79		8/18/2015
GW-42S**	84.18	**	---		---
GW-43SR	87.86	7.14	80.72		8/19/2015
GW-55S	81.70	4.37	77.33		8/18/2015
GW-55D	81.95	4.78	77.17		8/18/2015
GW-76S	88.45	7.88	80.57	TOC	8/18/2015
GW-78S	84.89	4.92	79.97		8/18/2015
GW-79S	81.54	4.86	76.68		8/18/2015
GW-201S	83.29	6.04	77.25		8/18/2015
GW-202S	86.97	6.93	80.04		8/18/2015
GW-202D	86.52	6.34	80.18		8/18/2015
GW-CA1	88.01	7.45	80.56		8/18/2015
PZ-16RR/IN	81.0	4.11	76.89		8/18/2015
PZ-16RR/OUT (4)	81.0	Dry	---		---
PZ-17RRR/IN	***	2.61	---		8/18/2015
PZ-17RRR/OUT (4)	***	3.74	---		8/18/2015
PZ-18R/IN	82.42	2.20	80.22		8/18/2015
PZ-18R/OUT (4)	82.42	2.15	80.27		8/18/2015
PZ-24	89.43	9.18	80.25		8/18/2015
PZ-25	88.90	8.79	80.11		8/18/2015

Prepared by: CTM 09/11//2015
Checked by: LCG 11/24/2015

Notes:
(1) - Measurement from top of PVC. If no PVC, measurement from TOC
(2) - Collected using a Solinst water interface probe
(3) - Groundwater Elevation = Reference Elevation - Depth to Water
(4) - Reported elevation of surface water adjacent to piezometer
TOC - Water level measurement taken from Top of Casing
* - Well removed for detention basin construction
** - Well destroyed during paving
*** - Piezometer replaced in South Ditch. Not surveyed
NGVD - National Geodetic Vertical Datum
msl - mean sea level
ft - feet

Table 3
Final Field Parameters for Groundwater Sampling
Slurry Wall/Cap Monitoring Program
Third Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Quarterly Slurry Wall/Cap Monitoring Well Samples						**Quarterly Slurry Wall/Cap Piezometer Samples**				
Location ID	GW-25	GW-78S	GW-79S	GW-202S	GW-202D	PZ-16RR	PZ-17RRR	PZ-18R	PZ-24	PZ-25
Date	8/18/2015	8/18/2015	8/18/2015	8/18/2015	8/18/2015	8/18/2015	8/18/2015	8/18/2015	8/18/2015	8/18/2015
Depth to Water (ft)	6.10	5.35	4.92	7.01	6.52	Dry	Dry	3.61	9.30	8.82
Temperature (° C)	13.89	14.41	14.95	14.76	13.97	20.05	21.27	20.59	17.25	15.84
Specific Conductivity (µS/cm)	1,012	1,411	2,380	1,015	3,458	2,313	800	1,345	1,980	1,397
pH (standard units)	6.89	6.79	6.63	6.31	4.98	7.17	7.49	6.89	6.78	6.59
Dissolved Oxygen (mg/L)	0.20	0.30	0.33	0.48	0.33	2.47	0.88	0.25	0.23	0.27
Turbidity (NTU)	0.90	1.20	0.64	0.76	3.64	5.61	11.0	4.02	3.51	1.97
ORP (millivolts)	-65.5	20.6	-15.0	-28.7	70.9	-93.5	-149.5	-60.0	-43.0	8.6

Notes:
ft - feet
µS/cm - microSiemens per centimeter
* - mS/cm (milliSiemens per centimeter)
1 µS/cm = 0.001 mS/cm
mg/L - milligrams per liter
NTU - nephelometric turbidity units
ORP - Oxidation/Reduction Potential
mV - millivolts

Prepared by: CTM 09/11/2015
Checked by: LCG 11/24/2015

Table 4
Groundwater Laboratory Analytical Program
Slurry Wall/Cap Monitoring Program
Third Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Chloride	EPA 300.0	0.28	mg/L
Specific Conductivity	SM18 2510B	1.0	µmhos/cm
Sulfate	EPA 300.0	0.35	mg/L
Filtered Metals			
Aluminum, filtered	SW846 6010B	60	µg/L
Chromium, filtered	SW846 6010B	1.0	µg/L

Notes:
mg/L - milligrams per liter
µmhos/cm - micromhos per centimeter
µmhos/cm = µS/cm (microSiemens per centimeter)
1 µS/cm = 0.001 mS/cm (milliSiemens per centimeter)
µg/L - micrograms per liter

Prepared by: CTM 09/11/2015
Checked by: LCG 11/24/2015

Table 5
Final Field Parameters for Surface Water Sampling
Slurry Wall/Cap Monitoring Program
Third Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Surface Water Samples							
Location ID	ISCO1	ISCO2	ISCO3	PZ-16RR	PZ-17RRR	PZ-18R	SD-17
Date	8/19/2015	8/19/2015	8/19/2015	8/19/2015	8/19/2015	8/19/2015	8/19/2015
Sample Depth of Water (ft)	0.40	0.15	0.20	0.15	0.20	0.50	0.15
Temperature (°C)	23.24	21.73	24.63	22.20	19.56	23.40	18.65
Specific Conductivity (µS/cm)	266	931	913	1,696	2,346	523	3,209
pH (standard units)	6.40	6.51	6.83	6.57	5.70	6.40	4.98
Dissolved Oxygen (mg/L)	1.05	4.83	4.42	4.95	3.47	1.45	2.93
Turbidity (NTU)	6.17	3.00	1.30	5.62	17.4	5.82	12.7
ORP (millivolts)	47.1	-62.7	7.8	6.3	86.3	58.4	122.5

Notes:
ft - feet
µS/cm - microSiemens per centimeter
* - mS/cm (milliSiemens per centimeter)
1 µS/cm = 0.001 mS/cm
mg/L - milligrams per liter
NTU - nephelometric turbidity units
ORP - Oxidation/Reduction Potential
mV - millivolts

Prepared by: CTM 09/11/2015
Checked by: LCG 11/24/2015

Table 6
Surface Water Analytical Program
Slurry Wall/Cap Monitoring Program
Third Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	2.0	mg/L
Nitrate	EPA 300.0	0.02	mg/L
Nitrite	EPA 300.0	0.02	mg/L
Chloride	EPA 300.0	0.28	mg/L
Specific Conductivity	SM18 2510B	1.0	µmhos/cm
Sulfate	EPA 300.0	0.35	mg/L
Total Metals			
Aluminum, Total	SW846 6010B	60	µg/L
Chromium, Total	SW846 6010B	1.0	µg/L
Sodium, Total	SW846 6010B	320	µg/L
Filtered Metals			
Aluminum, Filtered	SW846 6010B	60	µg/L
Chromium, Filtered	SW846 6010B	1.0	µg/L
Sodium, Filtered	SW846 6010B	320	µg/L

Notes:
mg/L - milligrams per liter
µmhos/cm - micromhos per centimeter
µmhos/cm = µS/cm (microSiemens per centimeter)
1 µS/cm = 0.001 mS/cm (milliSiemens per centimeter)
µg/L - micrograms per liter

Prepared by: CTM 09/11/2015
Checked by: LCG 11/24/2015

Table 7
Groundwater Elevations
Plant B Monitoring Program
Third Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL ID	Reference Elevation (1)	Depth to Water (2)	Depth to Product (3)	Product Thickness (4)	Groundwater Elevation (5)	Date Measured
I.D.	(ft msl)	(ft)	(ft)	(ft)	(feet NGVD)	
B-2	90.48	11.93	NPD	NA	78.55	8/20/2015
B-3	90.32	11.71	NPD	NA	78.61	8/20/2015
B-5R	91.38	12.22	NPD	NA	79.16	8/20/2015
B-7A	88.81	8.99	NPD	NA	79.82	8/20/2015
B-17	91.55	11.23	NPD	NA	80.32	8/20/2015
GW-13	90.57	11.88	NPD	NA	78.69	8/20/2015
GW-14	88.70	9.96	NPD	NA	78.74	8/20/2015
GW-15	90.01	10.18	NPD	NA	79.83	8/20/2015
GW-16R	91.21	12.09	NPD	NA	79.12	8/20/2015
GW-23	91.04	12.63	12.32	0.31	78.70	8/20/2015
GW-52S	87.95	9.52	NPD	NA	78.43	8/20/2015
GW-100	90.15	11.80	NPD	NA	78.35	8/20/2015
GW-101	90.14	11.89	NPD	NA	78.25	8/20/2015
GW-102	89.00	10.66	NPD	NA	78.34	8/20/2015
IW-1	90.71	12.18	NPD	NA	78.53	8/20/2015
IW-2	90.53	12.20	NPD	NA	78.33	8/20/2015
IW-3	90.76	12.33	NPD	NA	78.43	8/20/2015
IW-6	89.15	11.02	NPD	NA	78.13	8/20/2015
IW-7	90.10	11.96	NPD	NA	78.14	8/20/2015
IW-8	89.94	11.78	NPD	NA	78.16	8/20/2015
IW-9	89.78	11.51	NPD	NA	78.27	8/20/2015
IW-10	90.43	12.04	NPD	NA	78.39	8/20/2015
IW-11	89.92	14.22	14.20	0.02	75.72	8/20/2015
IW-12	90.31	13.91	NPD	NA	76.40	8/20/2015
IW-13	89.90	19.60	NPD	NA	70.30	8/20/2015
PID	89.97	11.89	NPD	NA	78.08	8/20/2015
P5	90.45	12.21	NPD	NA	78.24	8/20/2015
12-IN	89.84	11.43	NPD	NA	78.41	8/20/2015

Notes:

Prepared by: CTM 09/11/2015
Checked by: LCG 11/24/2015

(1) - Reference elevations surveyed 11/97. New TOC survey by Dana Perkins 4-5/98
(2) - Top of PVC. If no PVC, measurement from top of steel casing
(3) - Collected using a Solinst water interface probe or Geotech oil/water interface probe
(4) - If sheen is noted, a product thickness of 0.01 feet will be used to calculate the groundwater elevation
(5) - Groundwater Elevation = Reference Elevation - (Depth to Water - (Product Thickness x 0.95))
TOC - Top of Casing
NPD - No Product Detected
NA - Not Applicable
NGVD - National Geodetic Vertical Datum
msl - mean sea level
ft - feet
East Ditch - No sheen noted; Observed OK

Table 8
Final Field Parameters for Groundwater Sampling
Plant B Monitoring Program
Third Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Plant B Monitoring Well Samples	
Location	GW-16R
Date	8/19/2015
Depth to Water (ft)	12.79
Temperature (° C)	18.71
Specific Conductivity (µS/cm)	200
pH (standard units)	6.24
Dissolved oxygen (mg/L)	0.69
Turbidity (NTU)	1.30
Oxidation Reduction Potential (mV)	-3.9

Notes:
ft - feet
µS/cm - microSiemens per centimeter
* - mS/cm (milliSiemens per centimeter)
1 µS/cm = 0.001 mS/cm
mg/L - milligrams per liter

Prepared by: CTM 09/11/2015
Checked by: LCG 11/24/2015

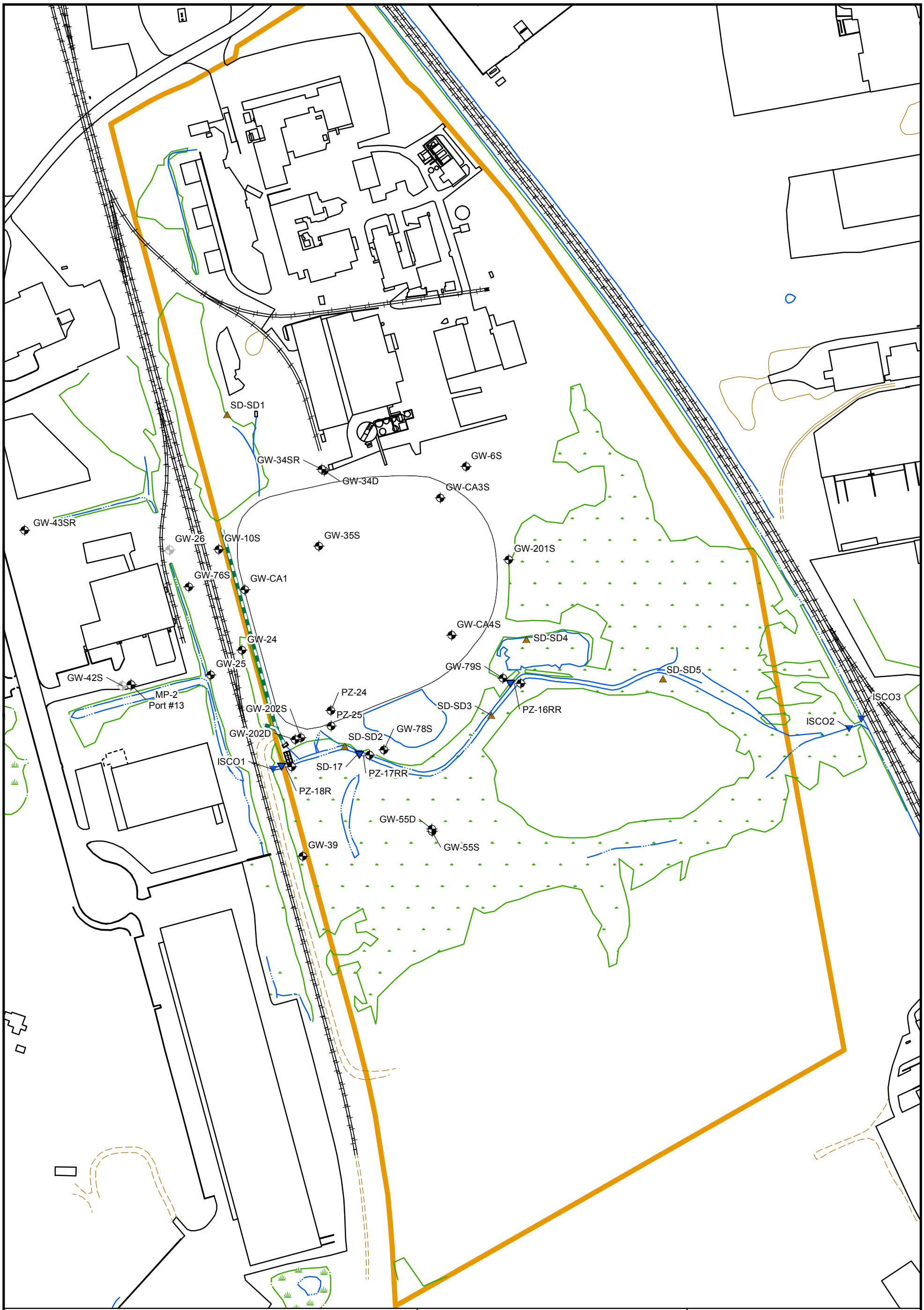
Table 9
Groundwater Laboratory Analytical Program
Plant B Monitoring Program
Third Quarter 2015 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Volatile organic compounds (VOC)			
2,4,4-Trimethyl-1-pentene	SW846 8260B	0.40	µg/L
2,4,4-Trimethyl-2-pentene	SW846 8260B	0.43	µg/L
Semivolatile organic compounds (SVOC)			
N-nitrosodiphenylamine	SW846 8270C	0.7	µg/L
bis(2-ethylhexyl)phthalate	SW846 8270C	0.4	µg/L
Volatile Petroleum Hydrocarbons (VPH)			
C5-C8 Aliphatics	MA VPH	1.5	µg/L
C5-C8 Aliphatics, Unadjusted	MA VPH	1.5	µg/L
C9-C12 Aliphatics	MA VPH	1.5	µg/L
C9-C12 Aliphatics, Unadjusted	MA VPH	1.5	µg/L
C9-C10 Aromatics	MA VPH	0.50	µg/L
Methyl-tert-butyl-ether (MTBE)	MA VPH	0.25	µg/L
Benzene	MA VPH	0.25	µg/L
Ethylbenzene	MA VPH	0.25	µg/L
m,p-Xylene	MA VPH	0.50	µg/L
o-Xylene	MA VPH	0.25	µg/L
Toluene	MA VPH	0.25	µg/L
Naphthalene	MA VPH	0.25	µg/L
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.50	mg/L
pH	SM 4500 H+ B	0.10	SU
Filtered Metals			
Iron, Filtered	SW846 6010B	19	µg/L

Notes:
µg/L - micrograms per liter
mg/L - milligrams per liter
SU - standard units

Prepared by: CTM 09/11/2015
Checked by: LCG 11/24/2015

FIGURES



Legend

- Groundwater Monitoring Location
- Groundwater and Surface Water Monitoring Location
- Surface Water Location
- Sediment Sample Location
- Destroyed Monitoring Well
- Paved Road
- Unpaved Road
- Site Boundary
- Wetland Boundary
- Railroad
- Structure
- Water
- Culvert
- Trail

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Amec Foster Wheeler
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271 Mill Road
Chelmsford, MA 01824

N

0 90 180 360 Feet

Figure 1
Slurry Wall / Cap Monitoring Program Sampling Locations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 6/22/15 | Checked/Date: CTM 6/22/15

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_IRWP2.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\Figures\Figure 1 - Slurry Wall Cap Monitoring Program Sampling Locations.pdf

Legend

- CapSeams
- Monitoring Well

H-# = Hole
P-# = Perforations
SB-# = Sandbag Not Tied
TOP-# = Top layer of cap missing
V-# = Vegetation
W-# = Ponding Water

Note:
Figure based on changes since last inspection.

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N

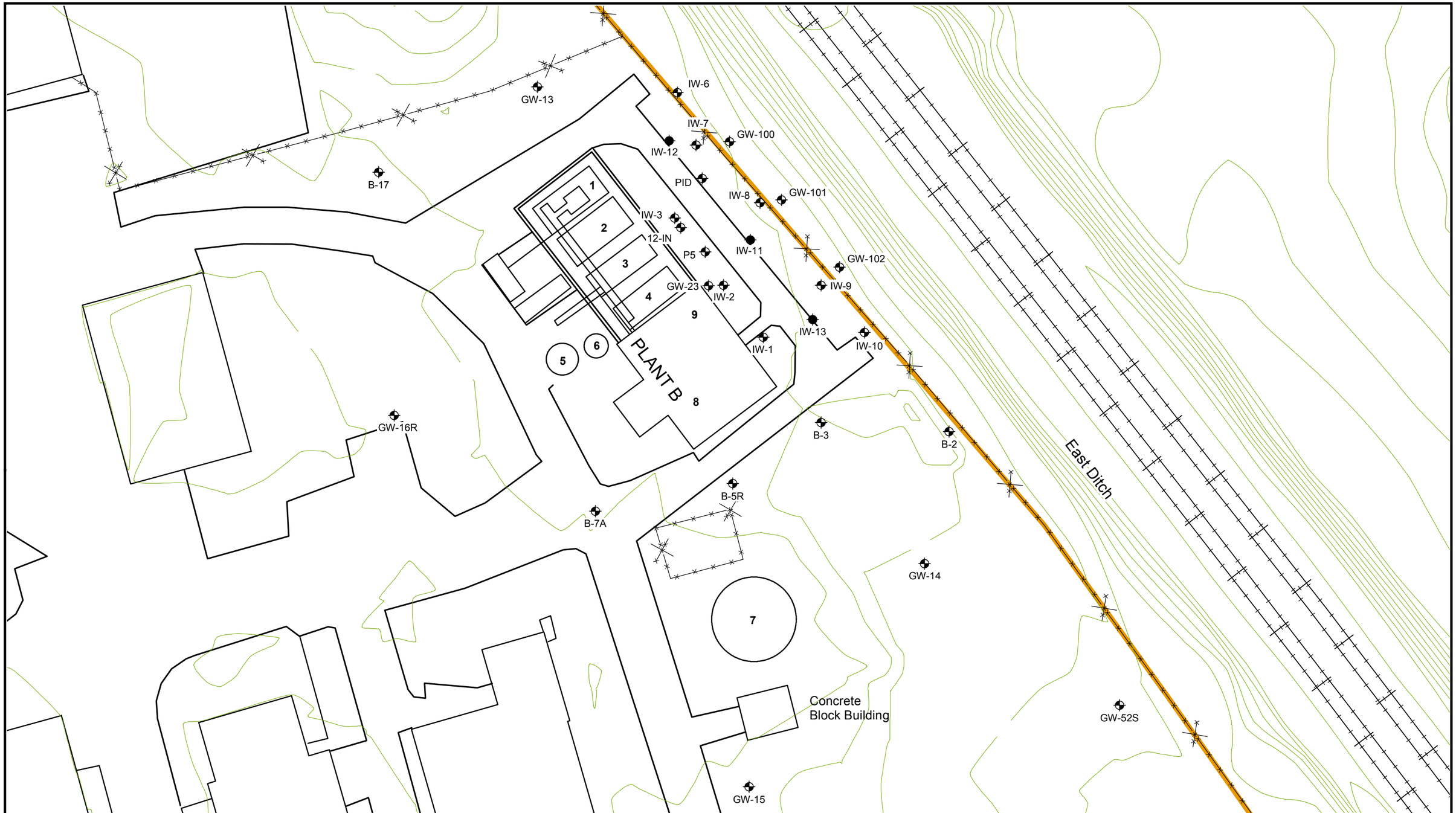
0 30 60 120 Feet

Figure 2
Third Quarter 2015 Temporary Cap Inspection Observations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared by BJR | Checked by CTM

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Olin_11X17_LS.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\2015 Quarterly\2nd Quarter 2015\Report\Figures\Figure 2 - Second Quarter 2015 Temporary Cap Inspection Observations.pdf



Tank #1 - Receives gravity overflow from Tank 2
and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Monitoring Well
- Recovery Well
- Elevation Contours

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Amec Foster Wheeler
Environment & Infrastructure
271 Mill Rd
Chelmsford, MA 01824

N

0 15 30 60 Feet

Figure 3
Plant B Monitoring Program
Sampling Locations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 06/22/15 | Checked/Date: CTM 06/22/15

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_PlantB_11X17_LS.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\Figures\Figure 3 - Plant B Monitoring Program Sampling Locations.pdf

APPENDIX A

Field Data Records and
Field Instrument Calibration Records

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME:	Olin Chemical Superfund Site - 3rd Quarter Sampling Event	TASK NO:	DATE: 8/18/2015
PROJECT NUMBER:	6107150016	FIELD CREW:	CTM - AmecFW
PROJECT LOCATION:	Wilmington, MA	SAMPLER NAME:	Chris Mazzolini
WEATHER CONDITIONS (AM):	Hot/ humid ~ 86°F	SAMPLER SIGNATURE:	
WEATHER CONDITIONS (PM):	Hot/ humid ~ 90°F	CHECKED BY: LCG	DATE: 11/24/2015

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: YSI
MODEL NO.: 556-MPS
UNIT ID NO.: MO15-04

AM CALIBRATION — Start Time: 8:40 End Time: 8:50

PM CALIBRATION CHECK — Start Time: 17:15 End Time: 17:25

	Units	Standard Value	Meter Value	*Acceptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
pH (4)	SU	4.0	4.08	+/- 0.1 pH Units			
pH (7)	SU	7.0	7.06	+/- 0.1 pH Units	7.0	7.09	+/- 0.3 pH Units
pH (10)	SU	10.0	-	+/- 0.1 pH Units			
Redox	+/- mV	240	240	+/- 10 mV	240	234.2	+/- 10 mV
Sp. Conductivity	µS/cm	1413	1429	+/- 3% of standard	1413	1458	+/- 5% of standard
DO (saturated)	%	100	94.8	+/- 2% of standard		90.0	%
DO (saturated)	mg/L[1] (see Chart 1)		7.88	+/- 0.2 mg/L		6.60	+/- 0.5 mg/L of sat. value
DO (<0.1)	mg/L	<0.1	-	< 0.5 mg/L	DO (<0.1)	-	< 0.5 mg/L
Temperature	°C		24.22			31.59	°C
Baro. Press.	mmHg		760.9			760.4	mmHg

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100P
UNIT ID NO.: MO24-03

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	< 0.1	0.2	< 0.1	0.09	+/- 5% of standard
Standard	NTU	20	19.9	20	20.2	
Standard	NTU	100	99.3	100	98.8	
Standard	NTU	800	783	800	776	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50		+/- 10% of standard
O_2	%	20.9		20.9		
H_2S	ppmv	25		25		
CO	ppmv	50		50		

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.

[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L)
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	5AA923	1/17
pH (7)	5AA543	1/17
pH (10)	-	-
ORP	7760	6/19
Conductivity	5AB544	2/16
< 0.1 Turb. Stan.	A5043	5/16
20 Turb. Stan.	A5106	7/16
100 Turb. Stan.	A5104	7/16
800 Turb. Stan.	A5104	7/16
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

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* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME:	Olin Chemical Superfund Site - 3rd Quarter Sampling Event	TASK NO:	DATE: 8/19/2015
PROJECT NUMBER:	6107150016	FIELD CREW:	CTM - AmecFW
PROJECT LOCATION:	Wilmington, MA	SAMPLER NAME:	Chris Mazzolini
WEATHER CONDITIONS (AM):	Sunny/ hot ~ 85°F	SAMPLER SIGNATURE:	
WEATHER CONDITIONS (PM):	Hot/ humid ~ 90°F	CHECKED BY: LCG	DATE: 11/24/2015

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: YSI
MODEL NO.: 556-MPS
UNIT ID NO.: MO15-04

AM CALIBRATION — Start Time: 8:10 End Time: 8:20

PM CALIBRATION CHECK — Start Time: 12:15 End Time: 12:25

	Units	AM Standard Value	AM Meter Value	*Acceptance Criteria (AM)	PM Standard Value	PM Meter Value	*Acceptance Criteria (PM)
pH (4)	SU	4.0	4.00	+/- 0.1 pH Units			
pH (7)	SU	7.0	7.00	+/- 0.1 pH Units	7.0	7.02	+/- 0.3 pH Units
pH (10)	SU	10.0	-	+/- 0.1 pH Units			
Redox	+/- mV	240	241.2	+/- 10 mV	240	238.6	+/- 10 mV
Sp. Conductivity	µS/cm	1413	1413	+/- 3% of standard	1413	1469	+/- 5% of standard
DO (saturated)	%	100	90.0	+/- 2% of standard		90.2	%
DO (saturated)	mg/L[1] (see Chart 1)		7.41	+/- 0.2 mg/L		7.03	+/- 0.5 mg/L of sat. value
DO (<0.1)	mg/L	<0.1	-	< 0.5 mg/L	DO (<0.1)	-	< 0.5 mg/L
Temperature	°C		25.08			28.16	°C
Baro. Press.	mmHg		762.2			763.8	mmHg

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100P
UNIT ID NO.: MO24-03

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	< 0.1	0.11	< 0.1	0.20	+/- 5% of standard
Standard	NTU	20	19.6	20	20.8	
Standard	NTU	100	98.7	100	98.7	
Standard	NTU	800	786	800	782	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50		+/- 10% of standard
O_2	%	20.9		20.9		
H_2S	ppmv	25		25		
CO	ppmv	50		50		

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L)
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	5AA923	1/17
pH (7)	5AA543	1/17
pH (10)	-	-
ORP	7760	6/19
Conductivity	5AB544	2/16
< 0.1 Turb. Stan.	A5043	5/16
20 Turb. Stan.	A5106	7/16
100 Turb. Stan.	A5104	7/16
800 Turb. Stan.	A5104	7/16
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

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* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

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FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-25	ROUND NO.	3
SAMPLE ID	OC-GW-25	SITE TYPE	Superfund	DATE	8/18/2015
TIME	START 14:42 END 15:35	JOB NUMBER	6107150016	BOTTLE TIME	15:25

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 5.60 FT.

WELL DEPTH (TOR): 12.50 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 6.10 FT.

SCREEN LENGTH: 3 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.046 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 2.01 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

0.02

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
14:44	6.10	180	14.32	1122	7.23	1.81	1.00	-128.7	~ 11 ft.	
14:54	6.10	180	14.24	1056	7.37	0.70	0.98	-114.0		Hard rain/ storm
15:15	6.10	180	14.17	1021	6.96	0.21	0.88	-71.1		
15:20	6.10	180	13.91	1014	6.92	0.19	0.86	-68.9		
15:25	6.10	180	13.89	1012	6.89	0.20	0.90	-65.5		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 2.0 gal.

NOTES Dissolved Al/ Cr field filtered

SIGNATURE:

LOCATION SKETCH

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-78S	ROUND NO.	3
SAMPLE ID	OC-GW-78S	SITE TYPE	Superfund	DATE	8/18/2015
TIME	START 12:33 END 13:15	JOB NUMBER	6107150016	BOTTLE TIME	13:05

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 4.92 FT.

WELL DEPTH (TOR): 10.4 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 5.35 FT.

SCREEN LENGTH: 9 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.069 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.50 GAL.

0.05

(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
12:35	5.28	180	14.76	1422	6.81	1.21	39.0	22.2	~ 9 ft.	
12:45	5.32	180	14.36	1410	6.80	0.60	8.03	22.4		
12:55	5.35	180	14.48	1409	6.81	0.37	4.21	20.2		
13:00	5.35	180	14.43	1411	6.81	0.33	2.16	18.6		
13:05	5.35	180	14.41	1411	6.79	0.30	1.20	20.6		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.5 gal.

LOCATION SKETCH

NOTES Dissolved Al/ Cr field filtered

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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SIGNATURE:

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-79S	ROUND NO.	3
SAMPLE ID	OC-GW-79S	SITE TYPE	Superfund	DATE	8/18/2015
TIME	START 15:40 END 16:10	JOB NUMBER	6107150016	BOTTLE TIME	16:02

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 4.86 FT.

WELL DEPTH (TOR): 11.24 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 4.92 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.01 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.15 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

<0.01

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
15:42	4.92	200	15.24	2348	6.70	1.15	5.25	-10.4	~ 9 ft.	
15:52	4.92	200	15.06	2367	6.64	0.47	1.85	-13.1		
15:57	4.92	200	15.03	2374	6.64	0.40	1.02	-14.8		
16:02	4.92	200	14.95	2380	6.63	0.33	0.64	-15.0		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.1 gal.

LOCATION SKETCH

NOTES Dissolved Al/ Cr field filtered

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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SIGNATURE:

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-202S	ROUND NO.	3
SAMPLE ID	OC-GW-202S	SITE TYPE	Superfund	DATE	8/18/2015
TIME	START 8:58 END 9:50	JOB NUMBER	6107150016	BOTTLE TIME	9:45

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 6.93 FT.

WELL DEPTH (TOR): 13.30 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 7.01 FT.

SCREEN LENGTH: 5 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.013 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 2.44 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

<0.01

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:00	7.01	200	15.05	982	6.05	1.33	6.84	51.5	~ 11 ft.	
9:10	7.02	200	14.67	969	6.32	1.45	2.57	18.9		
9:20	7.01	200	14.74	983	6.32	1.09	2.02	-3.8		
9:25	7.01	200	14.74	992	6.31	0.80	1.63	-14.9		
9:30	7.01	200	14.67	997	6.31	0.64	1.25	-18.1		
9:35	7.01	200	14.65	1005	6.30	0.50	0.98	-20.8		
9:40	7.01	200	14.72	1008	6.31	0.51	0.89	-26.9		
9:45	7.01	200	14.76	1015	6.31	0.48	0.76	-28.7		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 2.4 gal.

NOTES Dissolved Al/ Cr field filtered

SIGNATURE:

LOCATION SKETCH

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-202D	ROUND NO.	3
SAMPLE ID	OC-GW-202D	SITE TYPE	Superfund	DATE	8/18/2015
TIME	START 9:50 END 10:35	JOB NUMBER	6107150016	BOTTLE TIME	10:25

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 6.34 FT.

WELL DEPTH (TOR): 23.73 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 6.52 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.029 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.82 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

0.02

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:52	6.52	200	14.59	3815	5.03	2.35	14.20	68.5	~ 20 ft.	
10:15	6.52	200	13.97	3481	4.98	0.39	4.48	73.2		
10:20	6.52	200	13.97	3469	4.98	0.35	3.75	71.4		
10:25	6.52	200	13.97	3458	4.98	0.33	3.64	70.9		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.8 gal.

NOTES Dissolved Al/ Cr field filtered

SIGNATURE:

LOCATION SKETCH

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-16RR	ROUND NO.	3
SAMPLE ID	OC-PZ-16RR	SITE TYPE	Superfund	DATE	8/18/2015
TIME	START 16:40 END 17:10	JOB NUMBER	6107150016	BOTTLE TIME	17:00

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 4.11 FT.

WELL DEPTH (TOR): 5.00 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 0.75 IN.

FINAL DEPTH TO WATER: Dry FT.

SCREEN LENGTH: 1 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP		X	
CASING	X		
LOCKED		X	
COLLAR		X	

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: ~ 0.1 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
16:42	--	150	20.05	2313	7.17	2.47	104.0	-93.5	~ 5 ft.	
	Well dry; Sample recharge									
17:00	Collect Sample						5.61			

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 0.1 gal.

NOTES Dissolved Al/ Cr field filtered

SIGNATURE:

LOCATION SKETCH

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-17RRR	ROUND NO.	3
SAMPLE ID	OC-PZ17RRR	SITE TYPE	Superfund	DATE	8/18/2015
TIME	START 13:15 END 13:40	JOB NUMBER	6107150016	BOTTLE TIME	13:30

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT:
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 2.61 FT.

WELL DEPTH (TOR): 6.87 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 0.75 IN.

FINAL DEPTH TO WATER: Dry FT.

SCREEN LENGTH: 1 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP		X	
CASING	X		
LOCKED		X	
COLLAR		X	

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: ~ 0.1 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
13:17	--	150	21.27	800	7.49	0.88	210	-149.5	~ 6 ft.	
	Well dry; Sample recharge									
13:30	Collect Sample						11.0			

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 0.1 gal.

NOTES Dissolved Al/ Cr field filtered

SIGNATURE:

LOCATION SKETCH

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-18R	ROUND NO.	3
SAMPLE ID	OC-PZ-18R	SITE TYPE	Superfund	DATE	8/18/2015
TIME	START 10:40 END 11:40	JOB NUMBER	6107150016	BOTTLE TIME	11:30

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 2.20 FT.

WELL DEPTH (TOR): 5.97 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1 IN.

FINAL DEPTH TO WATER: 3.61 FT.

SCREEN LENGTH: 1.6 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED		X	
COLLAR		X	

DRAWDOWN VOLUME: 0.058 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.87 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

0.03

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:43	3.46	150	20.72	1695	7.00	0.32	121	-113.0	~ 5 ft.	
11:18	3.61	150	20.59	1355	6.91	0.24	4.98	-69.8		
11:23	3.61	150	20.69	1349	6.89	0.23	4.77	-61.2		
11:28	3.61	150	20.69	1345	6.89	0.25	4.02	-60.0		
11:30	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.8 gal.

NOTES Dissolved Al/ Cr field filtered

SIGNATURE:

LOCATION SKETCH

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-24	ROUND NO.	3
SAMPLE ID	OC-PZ-24	SITE TYPE	Superfund	DATE	8/18/2015
TIME	START 13:55 END 14:40	JOB NUMBER	6107150016	BOTTLE TIME	14:30

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 9.18 FT.

WELL DEPTH (TOR): 17.56 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 9.30 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.01 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.37 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
13:57	9.30	150	18.70	2169	6.42	2.84	20.4	-41.4	~ 14 ft.	
14:07	9.30	150	17.54	2062	6.74	0.69	10.7	-42.9		
14:20	9.30	150	17.39	1997	6.78	0.29	4.94	-44.4		
14:25	9.30	150	17.30	1989	6.79	0.26	4.03	-44.1		
14:30	9.30	150	17.25	1980	6.78	0.23	3.51	-43.0		
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.3 gal.

NOTES Dissolved Al/ Cr field filtered

SIGNATURE:

LOCATION SKETCH

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-25	ROUND NO.	3
SAMPLE ID	OC-PZ-25	SITE TYPE	Superfund	DATE	8/18/2015
TIME	START 11:50 END 12:30	JOB NUMBER	6107150016	BOTTLE TIME	12:20

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 8.79 FT.

WELL DEPTH (TOR): 17.70 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 8.82 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.05 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
11:52	8.82	150	16.76	1159	6.45	2.42	8.72	4.3	~ 15 ft.	
12:02	8.82	150	15.86	1392	6.59	0.48	4.36	9.4		
12:12	8.82	150	15.80	1398	6.58	0.36	2.43	8.3		
12:17	8.82	150	15.84	1397	6.59	0.27	1.97	8.6		
12:20	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.0 gal.

NOTES Dissolved Al/ Cr field filtered

SIGNATURE: [signature]

LOCATION SKETCH

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-16R	ROUND NO.	3
SAMPLE ID	OC-GW-16R	SITE TYPE	Superfund	DATE	8/19/2015
TIME	START 8:50 END 10:00	JOB NUMBER	6107150016	BOTTLE TIME	9:35

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 12.08 FT.

WELL DEPTH (TOR): 17.20 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 12.79 FT.

SCREEN LENGTH: 5 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.114 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.43 GAL.

0.079

(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:52	12.67	180	18.36	227	5.92	2.25	7.48	-30.5	~ 15 ft.	
9:02	12.75	120	18.02	205	6.03	1.27	2.84	-10.9		
9:12	12.76	110	18.30	201	6.17	0.90	2.81	1.1		
9:22	12.77	110	18.50	199	6.21	0.72	2.11	-0.5		
9:27	12.78	110	18.66	199	6.23	0.70	1.81	-2.4		
9:32	12.79	110	18.71	200	6.24	0.69	1.30	-3.9		
9:35	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[X] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[X] VOCs
[X] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[X] SVOCs
[X] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[X] VPH
[X] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Fe
[X] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[X] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[ ] Chloride	300.0	4 DEG. C	1 X 500 mL	[ ] Chloride
[ ] Sulfate	300.0	4 DEG. C	1 X 500 mL	[ ] Sulfate
[ ] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[ ] Specific Conductivity
[ ] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.4 gal.

NOTES Dissolved Fe field filtered

SIGNATURE:

LOCATION SKETCH

Sampled by: CTM

Prepared by: CTM

Checked by: LCG

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AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 8/19/2015
FIELD SAMPLE ID: OC-SW-ISCO1
ACTIVITY TIME: START 11:55 END 12:05
BOTTLE TIME: 12:00
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.80 ft.	SPEC. COND	266 uS/cm
DEPTH OF SAMPLE FROM SURFACE	0.40 ft.	D.O.	1.05 mg/L
TEMPERATURE	23.24 DEG C	SALINITY	--- %
TURBIDITY	6.17 NTU	ORP	47 mV
pH	6.40 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [ ] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [X] OTHER: Weir Area

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [X] NONE

Notes: Up-stream of PZ-18R; No flow

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

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SIGNATURE: _____

Sampled by: CTM
Prepared by: CTM
Checked by: LCG

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 8/19/2015
FIELD SAMPLE ID: OC-SW-ISCO2
ACTIVITY TIME: START 10:40 END 10:50
BOTTLE TIME: 10:45
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.30 ft.	SPEC. COND	931 uS/cm
DEPTH OF SAMPLE FROM SURFACE	0.15 ft.	D.O.	4.83 mg/L
TEMPERATURE	21.73 DEG C	SALINITY	--- %
TURBIDITY	3.00 NTU	ORP	-62.7 mV
pH	6.51 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [X] NONE

Notes: Location prior to discharge into the East Ditch; No flow; Orange color noted (F

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]
SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

amec foster wheeler

SIGNATURE: _____

Sampled by: CTM
Prepared by: CTM
Checked by: LCG

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 8/19/2015
FIELD SAMPLE ID: OC-SW-ISCO3
ACTIVITY TIME: START 10:15 END 10:25
BOTTLE TIME: 10:20
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.40 ft.	SPEC. COND	913 uS/cm
DEPTH OF SAMPLE FROM SURFACE	0.20 ft.	D.O.	4.42 mg/L
TEMPERATURE	24.63 DEG C	SALINITY	--- %
TURBIDITY	1.30 NTU	ORP	7.8 mV
pH	6.83 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [X] NONE

Notes: East Ditch; Up-stream of South Ditch confluence; Along Railway; Good flow

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]
SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

amec foster wheeler

SIGNATURE: _____

Sampled by: CTM
Prepared by: CTM
Checked by: LCG

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 8/19/2015
FIELD SAMPLE ID: OC-SW-PZ16RR
ACTIVITY TIME: START 10:55 END 11:05
BOTTLE TIME: 11:00
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.30 ft.	SPEC. COND	1,696 uS/cm
DEPTH OF SAMPLE FROM SURFACE	0.15 ft.	D.O.	4.95 mg/L
TEMPERATURE	22.20 DEG C	SALINITY	--- %
TURBIDITY	5.62 NTU	ORP	6.3 mV
pH	6.57 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [X] NONE

Notes: At location PZ-16RR; Good flow; Orange color noted (Fe?)

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

amec foster wheeler

SIGNATURE: _____

Sampled by: CTM
Prepared by: CTM
Checked by: LCG

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 8/19/2015
FIELD SAMPLE ID: OC-SW-PZ17RRR
ACTIVITY TIME: START 11:10 END 11:20
BOTTLE TIME: 11:15
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.40 ft.	SPEC. COND	2,346 uS/cm
DEPTH OF SAMPLE FROM SURFACE	0.20 ft.	D.O.	3.47 mg/L
TEMPERATURE	19.56 DEG C	SALINITY	--- %
TURBIDITY	17.4 NTU	ORP	86.3 mV
pH	5.70 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [X] NONE

Notes: At location PZ-17RRR; Slow flow; Orange/ milky color noted

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER_____

CLEAR OF LEAF LITTER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

amec foster wheeler

SIGNATURE: _____

Sampled by: CTM
Prepared by: CTM
Checked by: LCG

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 8/19/2015

FIELD SAMPLE ID: OC-SW-PZ18R
ACTIVITY TIME: START 11:40 END 11:50
BOTTLE TIME: 11:45

QC SAMPLES COLLECTED: NA

SURFACE WATER DATA

WATER DEPTH AT LOCATION	1.0 ft.	SPEC. COND	523 uS/cm
DEPTH OF SAMPLE FROM SURFACE	0.50 ft.	D.O.	1.45 mg/L
TEMPERATURE	23.40 DEG C	SALINITY	--- %
TURBIDITY	5.82 NTU	ORP	58.4 mV
pH	6.40 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [ ] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [X] OTHER: Weir Area

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [X] NONE

Notes: At location PZ-18R; No flow

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER_____

CLEAR OF LEAF LITTER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

amec foster wheeler

SIGNATURE: _____

Sampled by: CTM
Prepared by: CTM
Checked by: LCG

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107150016
DATE: 8/19/2015

FIELD SAMPLE ID: OC-SW-SD17
ACTIVITY TIME: START 11:25 END 11:35
BOTTLE TIME: 11:30

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.30 ft.	SPEC. COND	3,209 uS/cm
DEPTH OF SAMPLE FROM SURFACE	0.15 ft.	D.O.	2.93 mg/L
TEMPERATURE	18.65 DEG C	SALINITY	--- %
TURBIDITY	12.7 NTU	ORP	122.5 mV
pH	4.98 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [X] NONE

Notes: Up-stream of location PZ-17RRR; Slow flow; Orange/ milky color noted

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER_____

CLEAR OF LEAF LITTER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

amec foster wheeler

SIGNATURE: [signature]

Sampled by: CTM
Prepared by: CTM
Checked by: LCG

APPENDIX B

Chains of Custody

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Chris Mazzolini	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-70913-18027.1
Client Contact: Mr. James Cashwell	Phone: 339 927 3793	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested: Standard			Preservation Codes:
City: Charleston	TAT Requested (days): Standard			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
State, Zip: TN, 37310-0248				M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Phone: 423-336-4012(Tel)	PO #: REWI0025			
Email: jmcashwell@olin.com	WO #:			
Project Name: Groundwater Quarterly Event Desc: Groundwater Quarterly (Mar	Project #: 48006612			Other:
Site: Massachusetts	SSOW#:			

480-85895 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Sulfate/Chloride	350.1 - Ammonia	6010MCP - Dissolved Al/Cr	2510B - Specific Conductance	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	N		
OC-GW-202S	8/18/15	0945	G	Water	Y	N	1	1	1	1	4	
OC-GW-202D	8/18/15	1025	G	Water	Y	N	1	1	1	1	4	
OC-GW-25	8/18/15	1525	G	Water	Y	N	1	1	1	1	4	
OC-GW-78S	8/18/15	1305	G	Water	Y	N	1	1	1	1	4	
OC-GW-79S	8/18/15	1602	G	Water	Y	N	1	1	1	1	4	
OC-PZ-16RR	8/18/15	1700	G	Water	Y	N	1	1	1	1	4	
OC-PZ-17RRR	8/18/15	1330	G	Water	Y	N	1	1	1	1	4	
OC-PZ-18R	8/18/15	1130	G	Water	Y	N	1	1	1	1	4	
PZ-24	8/18/15	1430	G	Water	Y	N	1	1	1	1	4	
PZ-25	8/18/15	1220	G	Water	Y	N	1	1	1	1	4	
				Water								8/18/15

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/19/15 1450	Amec FW		8/19/15 1450	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/19/15 1700	TA		20 Aug 15 0250	TAB
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 0.0 #1

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Chris Mazzolini	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-70914-18028.1
Client Contact: Mr. James Cashwell	Phone: 339 927 3796	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested: Standard			
City: Charleston	TAT Requested (days): Standard			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0025			
Email: jmcashwell@olin.com	WO #:			
Project Name: Surface Water Quarterly Event Desc: Surfacewater Quarterly (Ma	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requeste

480-85896 Chain of Custody

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Sulfate/Chloride	350.1 - Ammonia	6010MCP - Total Al/Cr/Na	6010MCP - Dissolved Al/Cr/Na	2510B, 353.2, 353.2_Nitrite, Nitrate_Calc	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	D	N		
OC-ISCO1	8/19/15	1200	G	Water	Y	N	1	1	1	1	1	5	
OC-ISCO2		1045	G	Water	Y	N	1	1	1	1	1	5	
OC-ISCO3		1020	G	Water	Y	N	1	1	1	1	1	5	
OC-PZ-16RRSW		1100	G	Water	Y	N	1	1	1	1	1	5	
OC-PZ-17RRSW		1115	G	Water	Y	N	1	1	1	1	1	5	
OC-PZ-18RSW		1145	G	Water	Y	N	1	1	1	1	1	5	
OC-SD-17		1130	G	Water	Y	N	1	1	1	1	1	5	
				~~Water~~									

orm 8/19/15

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/19/15 1450	Amec FW		8-19-15 1450	
	8-19-15 1700			20 Aug 15 0250	TAB

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.5 #1

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Chris Marrolini	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-70915-18029.1
Client Contact: Mr. James Cashwell	Phone: 339-927-3796	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1

Company: Olin Corporation
Address: PO BOX 248
City: Charleston
State, Zip: TN, 37310-0248
Phone: 423-336-4012(Tel)
Email: jmcashwell@olin.com
Project Name: Plant B Event Desc: Plant B quarterly(March/May/August)
Site: Massachusetts

Due Date Requested: Standard
TAT Requested (days): Standard
PO #:
WO #:
Project #: 48006612
SSOW#:

Analysis Requested

480-85897 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 - Ammonia	6010MCP - Iron (D's)	MAVPH - VPH	8260MCP - VOC TMPs	8270_LL_MCP - SVOC NDPA/BEHP	SM4500_H+ - pH	8260MCP - (MOD) Custom 8260 MCP Analyte List Same bottles as Tmps						Total	Special Instructions/Note:
			Preservation Code:				S	D	A	A	N	N	A							
OC-GW-16R	8/19/15	0935	G	Water	Y	N	1	1	3	3	2	1	3						11	(VOC TMP Same Bottles Custom 8260 MCP)
Trip Blank 1	7/17/15	—	G	Water	N	N			2										2	
Trip Blank 2	7/17/15	—	G	Water	N	N				2			2						2	

8/19/15

Preservation Codes:
- HCL
- NaOH
- Zn Acetate
- Nitric Acid
- NaHSO4
- MeOH
- Amchlor
- Ascorbic Acid
- Ice
- DI Water
- EDTA
- EDA

M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)

Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/19/15 1450	Trace FW		8-19-15 1450	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8-19-15 1700	TAB		20Aug15 0250	TAB
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 0.2 #1

APPENDIX C

Third Quarter 2015
Temporary Cap Inspection Photo Log

Photo 1: General Cap Photo (note: cap tear and uplift from wind)

Photo 2: Sandbags (needs repairs)

Photo 3: Significant Tear (needs repair)

Photo 4: Drainage Grate

APPENDIX B

Data Validation Memoranda (*Provided on CD*)

B-1 Second Quarter 2015 Sampling Event
B-2 Third Quarter 2015 Sampling Event
B-3 Additional Sampling Events
- **May 2015 Calcium Sulfate Landfill Sampling**
- **June 2015 Private Well Sampling**
- **September 2015 Private Well Sampling**

B-4 Unvalidated Data
- **April 2015 – September 2015 Plant B RGP and Frac Tank Sampling**

APPENDIX C

Weir Monthly Inspection Reports
April 2015 – September 2015

December 23, 2015

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – April 2015
Amec Foster Wheeler Project No. 6107-15-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) and Olin Corporation. The weekly weir inspection reports for the month of April 2015 are attached. Amec Foster Wheeler conducted an inspection on Friday, April 24, 2015.

West Ditch Off-Property

Station A had high level of clear water for the first three inspections of the month and a normal level of clear water for the final inspection of the month. Station B had high level of clear water for the first three inspections of the month and a normal level of clear water for the final inspection of the month.

Weir

Station D had a high level of clear water for all four inspections of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from a moderate flow to a heavy flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a moderate flow of clear water.

South Ditch Downstream of the Weir

Stations E and F had a heavy flow of clear water for the first three inspections of the month and a moderate flow of clear water during the final inspection of the month. Light foaming was noted near Station F during the final inspection of the month. A moderate flow of clear water was observed at Station G during the first and last inspections of the

month. A heavy flow of clear water was observed at Station G during the second and third inspections of the month.

A moderate flow of clear water was observed, at the haybale line, during first three inspections of the month. A heavy flow of clear water was observed at the haybale line during the final inspection of the month.

Wetland Areas South of the South Ditch

Stations H and I were flooded with clear water during all four inspections of the month.

Wildlife

Birds observed along the South Ditch during the final inspection included robins and a blue jay.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
Amec Foster Wheeler E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
Amec Foster Wheeler Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2015\04-2015\April 2015 Weir Inspection Report.docx]

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 4/3/2015 **Time** 8:30 **Inspectors** Brian Guichard

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a high level of clear water.
	Station A		x	Stn B has a high level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a high level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a heavy flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a moderate flow through the center.
Unnamed Ditch				Stn H is flooded.
	Station H		x	Stn I is flooded.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a high flow from the wier area and a low flow from the outlet pipe. The main area is clear. The stream has a moderate to high flow of clear water.

The Hay Bale line has a moderate flow of clear water.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 4/10/2015 **Time** 11:30 **Inspectors** Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a high level of clear water.
	Station A		x	Stn B has a high level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a high level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a heavy flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a high flow through the center.
Unnamed Ditch				Stn H is flooded.
	Station H		x	Stn I is flooded.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a high flow from the wier area and no flow from the outlet pipe. The main area is lightly cloudy. The stream has a high flow of clear water.

The Hay Bale line has a moderate flow of clear water.

Note: Already picking up Deer Ticks along the trail.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 4/17/2015 Time 9:30 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a high level of clear water.
	Station A		x	Stn B has a high level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a high level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a heavy flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a high flow through the center.
Unnamed Ditch				Stn H is flooded.
	Station H		x	Stn I is flooded.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a high flow from the wier area and a moderate flow from the outlet pipe. The main area is clear. The stream has a high flow of clear water.

The Hay Bale line has a moderate flow of clear water.

Note: Picked up 6 Ticks along the trail.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 4/24/2015 **Time:** 8:00 **Inspectors:** B. Roden

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				
	Station A		X	Station A has a normal level of clear water.
	Station B		X	Station B has a normal level of clear water.
West Ditch Foot Bridge				**Filled in**
	Station C		X	
Weir - Upstream				Station D has a high level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F had a moderate flow of clear water with light foaming near the foot bridge. Station G was flooded with clear water.
	Station E	X		
	Station F	X		
	Station G		X	
Unnamed Ditch				
	Station H		X	Station H has a moderate area of standing water.
	Station I		X	Station I is flooded with clear water.
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is a low flow of clear water from the plant B oulet pipe and a moderate flow from the Weir outlet pipe. The main area has a high level of clear water. A brown or rust color is visible on the bottom.

The haybale line has a heavy flow of clear water.

A blue jay and robins were observed along the ditch.

December 23, 2015

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – May 2015
Amec Foster Wheeler Project No. 6107-15-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) and Olin Corporation. The weekly weir inspection reports for the month of May 2015 are attached. Amec Foster Wheeler conducted an inspection on Friday, May 29, 2015.

West Ditch Off-Property

Station A had a normal level of clear water during the first and fourth inspections of the month and a low level of clear water during the other three inspections of the month. Station B had a normal level of clear water for all inspections of the month.

Weir

Station D had a normal level of clear water during all inspections of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from no flow to a moderate flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a low flow of clear water. The main area had a normal level of clear water during all inspections. A brown or rust color was observed on the bottom of the main area during the final inspection of the month.

South Ditch Downstream of the Weir

Stations E and F had a low flow of clear water for all inspections of the month. Light foaming was noted near Station E during the final inspection of the month. A low flow of clear water through a center channel was observed at Station G during all inspections of the month.

A moderate flow of clear water was observed, at the haybale line, during the first inspection of the month. A low flow of clear water was observed at the haybale line for the final four inspections of the month.

Wetland Areas South of the South Ditch

Station H had standing water for the first three inspections of the month and was saturated soil during the final two inspections of the month. Station I was flooded with clear water during the second inspection of the month and was saturated soil for the other four inspections of the month.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
Amec Foster Wheeler E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
Amec Foster Wheeler Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2015\05-2015\May 2015 Weir Inspection Report.docx]

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 5/1/2015 Time 9:30 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	Filled in
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				Stn H is flooded.
	Station H		x	Stn I is saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate flow from the wier area and no flow from the outlet pipe. The main area is clear. The stream has a moderate flow of clear water. There is some algea growth along the edges of the main area.

The Hay Bale line has a moderate flow of clear water.

Note: Picked up 18 Ticks along the trail.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 5/8/2015 Time 10:30 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				Stn H has standing water.
	Station H		x	Stn I has standing water.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the wier area and no flow from the outlet pipe. The main area is clear. The stream has a trickle flow of clear water. There is some algea growth along the edges of the main area.

The Hay Bale line has a trickle flow of clear water.

Note: Picked up 12 Ticks along the trail.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 5/15/2015 Time 9:00 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	Filled in
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				Stn H has standing water.
	Station H		x	Stn I has saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the wier area and a low flow from the outlet pipe. The main area is clear. The stream has a low flow of clear water. There is some algea growth along the edges of the main area.

The Hay Bale line has a trickle flow of clear water.

Note: Picked up 6 Ticks along the trail. Also noticed canine scat on the path in several locations.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 5/22/2015 Time 10:00 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				
	Station A		x	Stn A has a normal level of clear water.
	Station B		x	Stn B has a normal level of clear water.
West Ditch Foot Bridge				
	Station C		x	Filled in
Weir - Upstream				
	Station D	x		Stn D has a normal level of clear water.
Weir - Downstream				
	Station E	x		Stations E & F have a low flow of clear water.
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				
	Station H		x	Stn H has saturated soil.
	Station I		x	Stn I has saturated soil.
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate flow from the wier area and no flow from the outlet pipe. The main area is clear. The stream has a low flow of clear water.

The Hay Bale line has a low flow of clear water.

Note: Picked up 9 Ticks along the trail.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 5/29/2015 **Time:** 8:00 **Inspectors:** B. Roden

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				
	Station A		X	Station A has a low level of clear water.
	Station B		X	Station B has a normal level of clear water.
West Ditch Foot Bridge				**Filled in**
	Station C		X	
Weir - Upstream				Station D has a normal level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F has a low to moderate flow of
	Station E	X		clear water with light foaming at the check dams.
	Station F	X		Station G is mostly saturated soil
	Station G		X	with a channel in the center.
Unnamed Ditch				
	Station H		X	Station H is saturated soil.
	Station I		X	Station I is saturated soil
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is no flow from the plant B oulet pipe and a low flow from the Weir outlet pipe. The main area has a normal level of clear water. A brown or rust color is visible on the bottom.

The haybale line has a low flow of clear water.

December 23, 2015

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – June 2015
Amec Foster Wheeler Project No. 6107-15-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Amec Foster Wheeler E&I, Inc. (Amec Foster Wheeler) and Olin Corporation. The weekly weir inspection reports for the month of June 2015 are attached. Amec Foster Wheeler conducted an inspection on Friday, June 26, 2015.

West Ditch Off-Property

Station A had a normal level of clear water during two inspections of the month and a low level of clear water during two inspections of the month. Station B had a normal level of clear water for all inspections of the month.

Weir

Station D had a normal level of clear water during all inspections of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from no flow to a moderate flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a low flow of clear water. The main area had a normal level of clear water during all inspections. A brown or rust color was observed on the bottom of the main area during the final inspection of the month.

South Ditch Downstream of the Weir

Stations E and F had a moderate flow of clear water during the first and last inspections of the month and a low flow of clear water during the second and third inspections of the month. Light foaming was noted near Station E during the final inspection of the month. A low flow of clear water was observed at Station G during all inspections of the month.

A low flow of clear water was observed, at the haybale line, during all four inspections of the month.

Wetland Areas South of the South Ditch

Stations H and I had standing water during the first inspection of the month. During the remaining three inspections of the month Stations H and I were saturated soil.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
Amec Foster Wheeler E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
Amec Foster Wheeler Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2015\06-2015\June 2015 Weir Inspection Report.docx]

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 6/5/2015 Time 10:00 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				
	Station A		x	Stn A has a normal level of clear water.
	Station B		x	Stn B has a normal level of clear water.
West Ditch Foot Bridge				
	Station C		x	Filled in
Weir - Upstream				
	Station D	x		Stn D has a normal level of clear water.
Weir - Downstream				
	Station E	x		Stations E & F have a moderate flow of clear water.
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				
	Station H		x	Stn H has some free standing water.
	Station I		x	Stn I has some free standing water.
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate flow from the wier area and a low flow from the outlet pipe. The main area is clear. The stream has a moderate flow of clear water.

The Hay Bale line has a low flow of clear water.

Note: Picked up 8 Ticks along the trail.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 6/12/2015 Time 10:00 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	Filled in
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				Stn H has saturated soil.
	Station H		x	Stn I has saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the wier area and a low flow from the outlet pipe. The main area is clear. The stream has a low flow of clear water.

The Hay Bale line has a low flow of clear water.

Note: Picked up 6 Ticks along the trail.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 6/19/2015 Time 10:00 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				
	Station A		x	Stn A has a normal level of clear water.
	Station B		x	Stn B has a normal level of clear water.
West Ditch Foot Bridge				
	Station C		x	Filled in
Weir - Upstream				
	Station D	x		Stn D has a normal level of clear water.
Weir - Downstream				
	Station E	x		Stations E & F have a low flow of clear water.
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				
	Station H		x	Stn H has saturated soil.
	Station I		x	Stn I has saturated soil.
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate flow from the wier area and no flow from the outlet pipe. The main area is clear with a light scum on the water surface. The stream has a low flow of clear water.

The Hay Bale line has a low flow of clear water.

Note: Picked up 8 Ticks along the trail.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 6/26/2015 **Time:** 8:00 **Inspectors:** B. Roden

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				
	Station A		X	Station A has a low level of clear water.
	Station B		X	Station B has a normal level of clear water.
West Ditch Foot Bridge				**Filled in**
	Station C		X	
Weir - Upstream				Station D has a normal level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F have a moderate flow of clear
	Station E	X		water with light foaming at the check dams.
	Station F	X		Station G has a low flow in the center
	Station G		X	with some flooding.
Unnamed Ditch				
	Station H		X	Station H is saturated soil.
	Station I		X	Station I is saturated soil
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is a low flow of clear water from the plant B outlet pipe and a low flow from the Weir outlet pipe. The main area has a low level of clear water. A brown of rust color is visible on the bottom.

The haybale line has a low flow of clear water.

December 23, 2015

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – July 2015
Amec Foster Wheeler Project No. 6107-15-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Amec Foster Wheeler E&I, Inc. (Amec Foster Wheeler) and Olin Corporation. The weekly weir inspection reports for the month of July 2015 are attached. Amec Foster Wheeler conducted an inspection on Friday, July 31, 2015.

West Ditch Off-Property

Station A had a normal level of clear water for the first four inspections of the month and a low level of clear water during the final inspection of the month. Station B had a normal level of clear water during the first three inspections of the month and a low level of clear water during the final two inspections of the month.

Weir

Station D had a normal level of clear water during all inspections of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from no flow to a moderate flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from a low flow to a moderate flow of clear water. The main area had a normal level of clear water during the first four inspections of the month and a low level of clear water during the final inspection of the month. A brown or rust color was observed on the bottom of the main area during the final inspection of the month.

South Ditch Downstream of the Weir

Stations E and F had a moderate flow of clear water during the first two inspections of the month and a low flow of clear water during the final three inspections of the month. Light foaming was noted near Station E during the third and fifth inspections of the

month. A low flow of clear water was observed at Station G during the first four inspections of the month. During the final inspection of the month, Station G was mostly saturated soil with some standing water but no apparent flow.

A low flow of clear water was observed, at the haybale line, during the first four inspections of the month. During the final inspection of the month no flow was observed at the haybale line and the surrounding area was mostly dry.

Wetland Areas South of the South Ditch

Station H had standing water during the first three inspections of the month and was saturated soil during the final two inspections of the month. Station I had standing water during the first inspection of the month and was saturated soil during the final four inspections of the month.

Wildlife

A great blue heron was observed in the detention basin during the final inspection of the month. Also multiple frogs were observed along the South Ditch during the final inspection of the month.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
Amec Foster Wheeler E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
Amec Foster Wheeler Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2015\07-2015\July 2015 Weir Inspection Report.docx]

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 7/2/2015 Time 0:15 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				
	Station A		x	Stn A has a normal level of clear water.
	Station B		x	Stn B has a normal level of clear water.
West Ditch Foot Bridge				
	Station C		x	Filled in
Weir - Upstream				
	Station D	x		Stn D has a normal level of clear water.
Weir - Downstream				
	Station E	x		Stations E & F have a moderate flow of clear water.
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				
	Station H		x	Stn H has standing water.
	Station I		x	Stn I has standing water.
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate flow from the wier area and a moderate flow from the outlet pipe. The main area is clear. The stream has a moderate flow of clear water.

The Hay Bale line has a low flow of clear water.

Note: Picked up 8 Ticks along the trail and noticed canine scat at several locations.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 7/10/2015 Time 10:30 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	Filled in
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a moderate flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				Stn H has standing water.
	Station H		x	Stn I has saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate flow from the wier area and a low flow from the outlet pipe. The main area is clear. The stream has a moderate flow of clear water.

The Hay Bale line has a low flow of clear water.

Note: Picked up 6 Ticks along the trail.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 7/17/2015 Time 1:00 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				Stn H has standing water.
	Station H		x	Stn I has saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the wier area and a low flow from the outlet pipe. The main area is clear. The stream has a moderate flow of clear water with some mild foaming at the check dams.

The Hay Bale line has a low flow of clear water.

Note: Picked up 3 Ticks along the trail.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 7/24/2015 Time 10:00 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a low level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a low flow through the center.
Unnamed Ditch				Stn H has saturated soil.
	Station H		x	Stn I has saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the wier area and a low flow from the outlet pipe. The main area is clear with a thin layer of white scum on the water surface.. The stream has a moderate flow of clear water.

The Hay Bale line has a low flow of clear water.

Note: Picked up 3 Ticks along the trail.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 7/31/2015 **Time:** 8:00 **Inspectors:** B. Roden

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				
	Station A		X	Station A has a very low level of water.
	Station B		X	Station B has a low level of clear water.
West Ditch Foot Bridge				**Filled in**
	Station C		X	
Weir - Upstream				Station D has a normal level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F has a low flow of clear
	Station E	X		water with light foaming at the check dams.
	Station F	X		Station G is mostly mud and obstructed
	Station G		X	by vegetation.
Unnamed Ditch				
	Station H		X	Station H is saturated soil.
	Station I		X	Station I is saturated soil
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is a low flow of clear water from the plant B outlet pipe and a low flow from the Weir outlet pipe. The main area has a low level of clear water. A brown or rust color is visible on the bottom.

The haybale line has no flow and is dry.

A great blue heron was in the detention basin. Multiple frogs were observed along the South Ditch.

December 23, 2015

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – August 2015
Amec Foster Wheeler Project No. 6107-15-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Amec Foster Wheeler E&I, Inc. (Amec Foster Wheeler) and Olin Corporation. The weekly weir inspection reports for the month of August 2015 are attached. Amec Foster Wheeler conducted an inspection on Friday, August 28, 2015.

West Ditch Off-Property

Station A had a low level of clear water for all inspections of the month. Station B had a normal level of clear water for all inspections of the month.

Weir

Station D had a normal level of clear water for all inspections of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from no flow to a low flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a low flow of clear water.

South Ditch Downstream of the Weir

Stations E and F had a low flow of clear water for all inspections of the month. Station G was obstructed from view by the vegetation growing along the stream during all inspections of the month.

A low flow of clear water was observed at the haybale line for all inspections of the month.

Wetland Areas South of the South Ditch

Station H was saturated soil during three inspections of the month and had some standing water during one inspection of the month. Station I was saturated soil for all inspections of the month except the last. In the last inspection, soil was dry.

Wildlife

A great blue heron was observed near the foot bridge during the second inspection of the month. During the final inspection of the month, a coyote was observed near Station H and multiple frogs were observed along the South Ditch.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
Amec Foster Wheeler E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
Amec Foster Wheeler Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2015\08-2015\August 2015 Weir Inspection Report.docx]

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 8/7/2015 Time 10:00 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered by vegetation.
Unnamed Ditch				Stn H has saturated soil.
	Station H		x	Stn I has saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the weir area and a trickle flow from the outlet pipe. The main area is clear with a thin layer of white scum on the water surface.. The stream has a low flow of clear water.

The Hay Bale line has a trickle flow of clear water.

Note: Picked up 6 Ticks along the trail and noticed animal scat in numerous locations.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 8/14/2015 Time 9:30 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered by vegetation.
Unnamed Ditch				Stn H has some standing water.
	Station H		x	Stn I has saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the weir area and a low flow from the outlet pipe. The main area is clear. The stream has a low flow of clear water.

The Hay Bale line has a trickle flow of clear water.

Note: Picked up 4 Ticks along the trail and noticed animal scat in numerous locations. Also noticed one Blue Heron near the foot bridge.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 8/21/2015 Time 6:30 Inspectors Brian Guichard

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low trickle of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered by vegetation.
Unnamed Ditch				Stn H has saturated soil.
	Station H		x	Stn I has saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the weir area and no flow from the outlet pipe. The main area is clear. The stream has a trickle flow of clear water.

The Hay Bale line has a trickle flow of clear water.

Note: Picked up 5 Ticks along the trail.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 8/28/2015 **Time:** 8:30 **Inspectors:** B. Roden

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				
	Station A		X	Station A has a low level of water.
	Station B		X	Station B has a normal level of clear water.
West Ditch Foot Bridge				**Filled in**
	Station C		X	
Weir - Upstream				Station D has a normal level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F has a low flow of clear
	Station E	X		water.
	Station F	X		Station G is obstructed from sight
	Station G		X	by vegetation.
Unnamed Ditch				
	Station H		X	Station H is saturated soil.
	Station I		X	Station I is dry.
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is no flow from the plant B outlet pipe and a low flow from the Weir outlet pipe. The main area has a normal level of clear water.

There are areas of the water surface covered with a white foam or scum.

A brown or rust color is visible on the bottom.

The haybale line has a low flow of clear water.

A coyote was observed near Station H.

Multiple frogs were observed along the South Ditch.

December 23, 2015

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – September 2015
Amec Foster Wheeler Project No. 6107-15-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Amec Foster Wheeler E&I, Inc. (Amec Foster Wheeler) and Olin Corporation. The weekly weir inspection reports for the month of September 2015 are attached. Amec Foster Wheeler conducted an inspection on Friday, September 25, 2015.

West Ditch Off-Property

Station A had a low level of clear water for two inspections of the month and a normal level of clear water for one inspection of the month. During the final inspection of the month, Station A had no water present and was only saturated soil. Station B had a normal level of clear water for three inspections of the month and a low level of clear water for one inspection of the month.

Weir

Station D had a normal level of water for three inspections of the month and a low level of water during the final inspection of the month. The water at Station D was clear during three of the inspections of the month and had a tannic color during one inspection of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from no flow to a low flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a low flow of clear water. The main area had a normal level of clear water during two inspections of the month and a low level of clear water during two inspection of the month. During the final two inspections of the month, some light foaming was observed in the main area.

South Ditch Downstream of the Weir

Stations E and F had a low flow of clear water during three inspections of the month and a moderate flow of clear water during one inspection of the month. Station G was obstructed from view by the vegetation growing along the stream during the first three inspections of the month. During the final inspection of the month, Station G had very little water and was mostly dry.

A low flow of clear water was observed at the haybale line during two inspections of the month and a moderate flow of clear water was observed during one inspection of the month. During the final inspection of the month there was no flow at the haybale line and the surrounding area was dry.

Wetland Areas South of the South Ditch

Station H was saturated soil during two inspections of the month and had some standing water during one inspection of the month. Station H was dry during the final inspection of the month. Station I had some standing water during one inspection of the month. Station I was dry during the other three inspections of the month.

Wildlife

A turtle was observed near Station D during the third inspection of the month.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
Amec Foster Wheeler E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
Amec Foster Wheeler Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2015\09-2015\September 2015 Weir Inspection Report.docx]

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 9/3/2015 Time 8:30 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have trickle flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered by vegetation.
Unnamed Ditch				Stn H has mildly saturated soil.
	Station H		x	Stn I has dry soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the weir area and no flow from the outlet pipe. The main area is clear. The stream has a trickle flow of clear water.

The Hay Bale line has a trickle flow of clear water.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 9/11/2015 Time 12:30 Inspectors Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a moderate flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered by vegetation.
Unnamed Ditch				Stn H has standing water.
	Station H		x	Stn I has standing water.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is low flow from the weir area and low flow from the outlet pipe. The main area is clear. The stream has a moderate flow of clear water.

The Hay Bale line has a trickle moderate flow of clear water.

Note: picked up 4 ticks along the trail.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 9/18/2015 **Time** 22:00 **Inspectors** Leroy Johnson

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of tannic water.
	Station D	x		See notes.
Weir - Downstream				Stations E & F have a trickle flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered by dying vegetation.
Unnamed Ditch				Stn H has saturated soil.
	Station H		x	Stn I is dry.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the weir area and a trickle flow from the outlet pipe. The main area has a thin layer of white scum on the surface. The stream has a trickle flow of clear water.

The Hay Bale line has a trickle moderate flow of clear water.

Note: Saw a small fish 4"-5" in length and a turtle 5"-6" in diameter in station D water.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 9/25/2015 **Time:** 8:30 **Inspectors:** B. Roden

Station		Precipitate Observation Yes	Precipitate Observation No	Other Observations
Offsite Fenced Ditch System				Station A has no water only saturated soil.
	Station A		X	Station B has a very low level of water
	Station B		X	with some areas of no water.
West Ditch Foot Bridge				**Filled in**
	Station C		X	
Weir - Upstream				Station D has a low level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F have a almost no flow of clear
	Station E	X		water, with light foaming from the main area
	Station F	X		to the foot bridge.
	Station G		X	Station G has no water.
Unnamed Ditch				
	Station H		X	Station H is dry.
	Station I		X	Station I is dry.
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is no flow from the plant B outlet pipe and no flow from the Weir outlet pipe. The main area has a low level of clear water. Most of the water surface in the main area is covered with a white foam or scum.

The haybale line is dry.

APPENDIX D

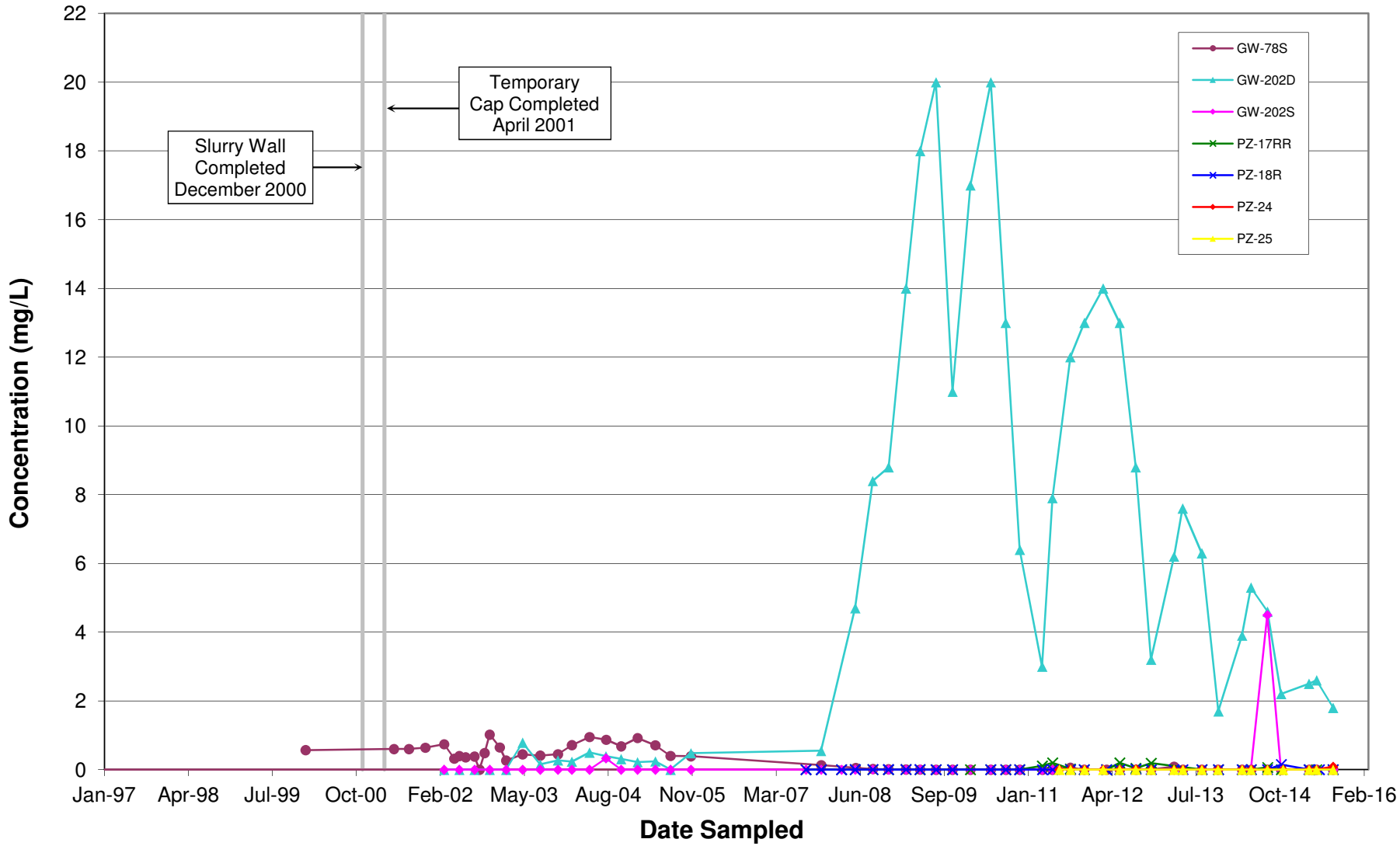
Slurry Wall/Cap Groundwater and Surface Water Time Series Plots

D-1 Groundwater (Aluminum, Ammonia, Chloride, Chromium, Sulfate)
D-2 Surface Water (Aluminum, Ammonia, Chloride, Chromium, Sulfate)

APPENDIX D

Slurry Wall/Cap Groundwater and Surface Water Time Series Plots

D-1 Groundwater (Aluminum, Ammonia, Chloride, Chromium, Sulfate)



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

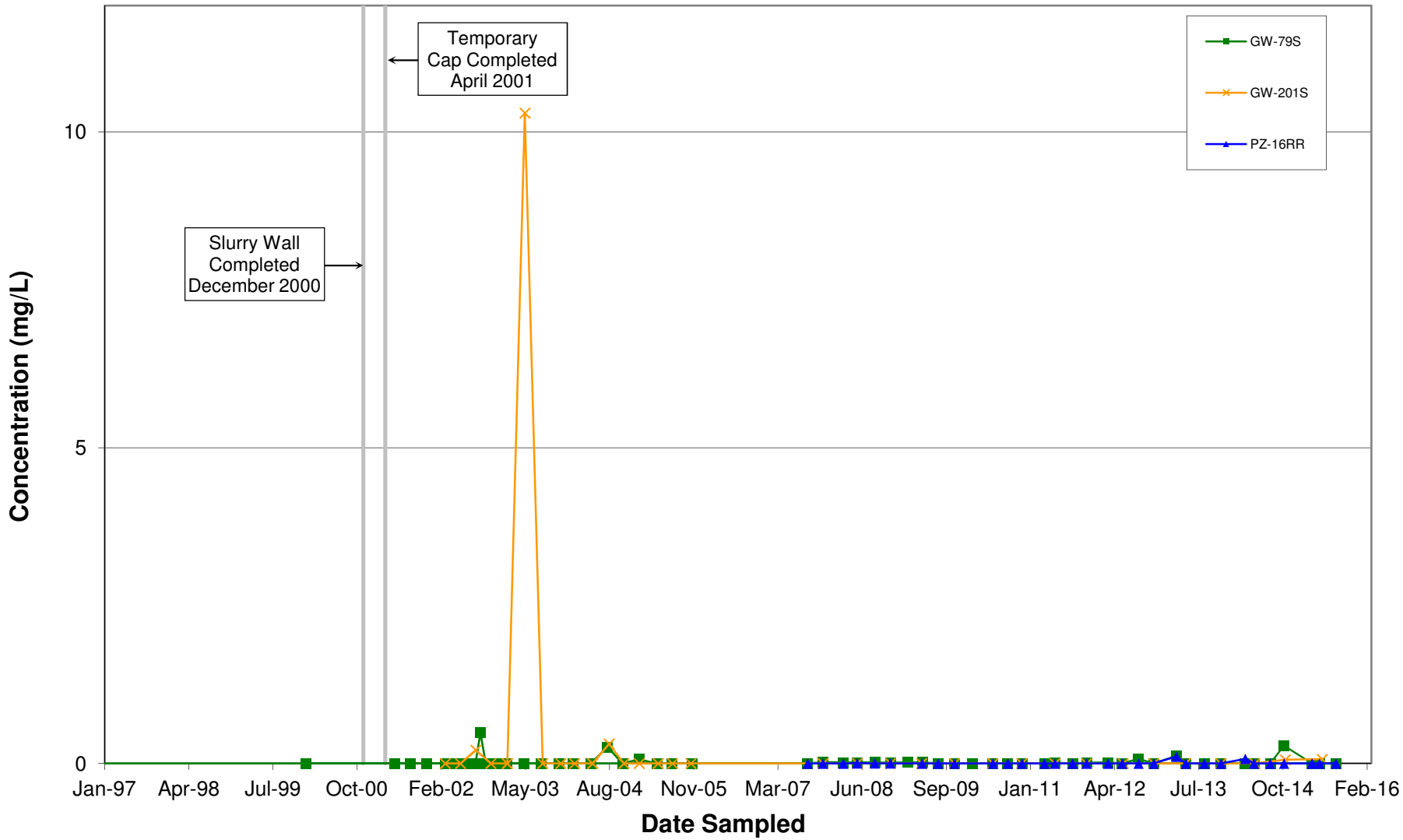
amec foster wheeler

Filtered Aluminum in Groundwater
South of Containment Structure

Figure D-1.1

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum GW S

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

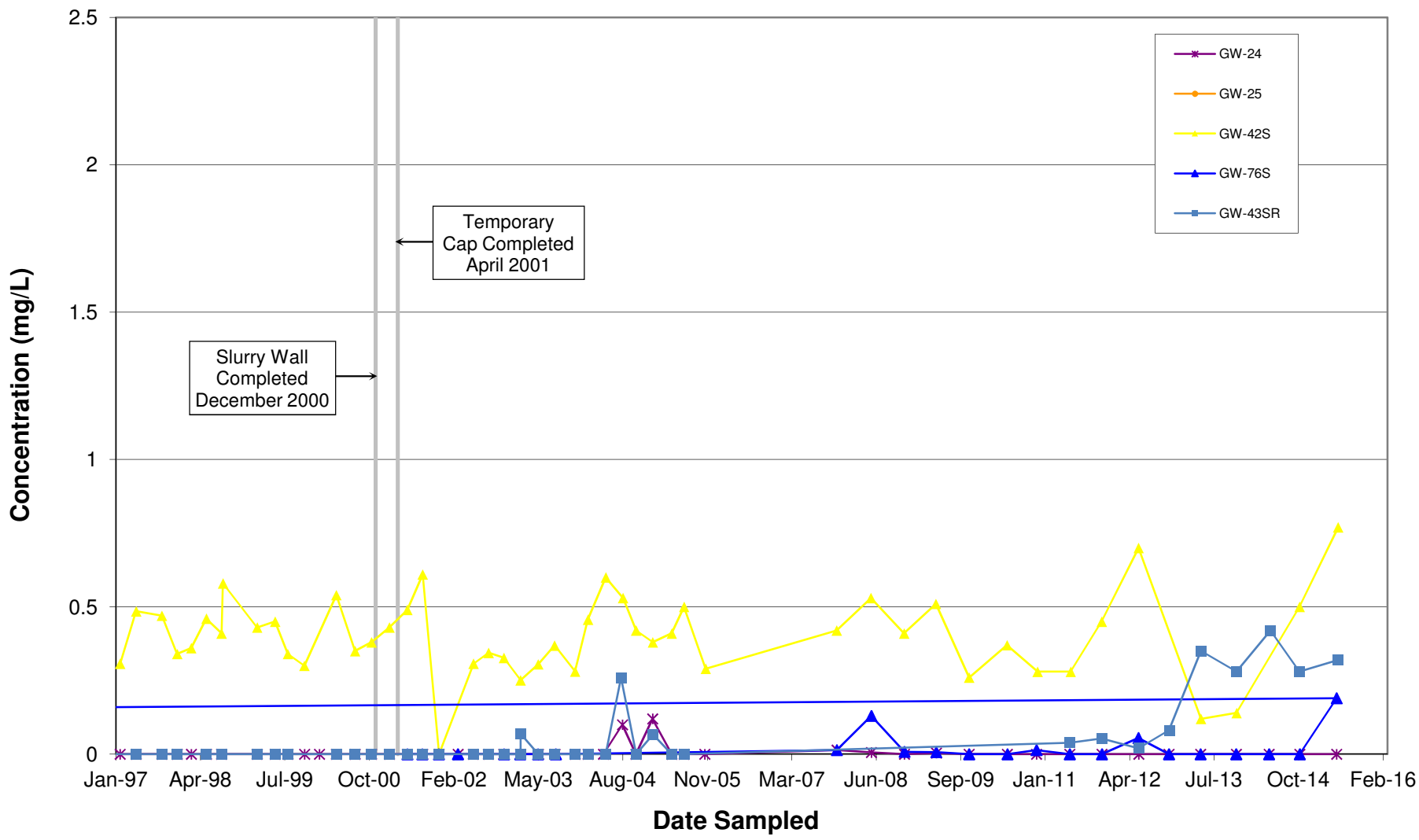
amec foster wheeler

Filtered Aluminum in Groundwater
Southeast of Containment Structure

Figure D-1.2

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum GW SE

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

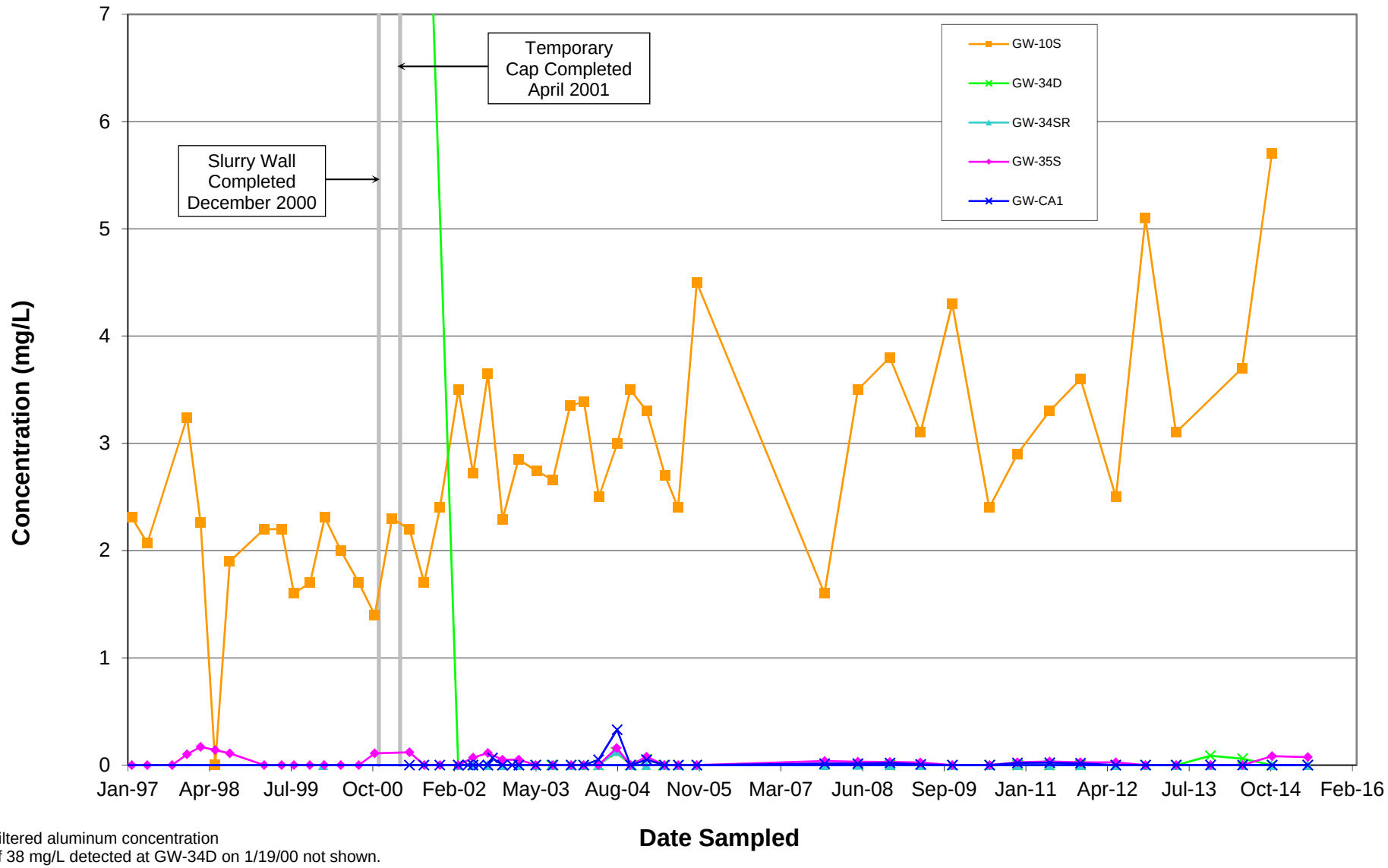
amec foster wheeler

Filtered Aluminum in Groundwater
West of Containment Structure

Figure D-1.3

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum GW W

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015

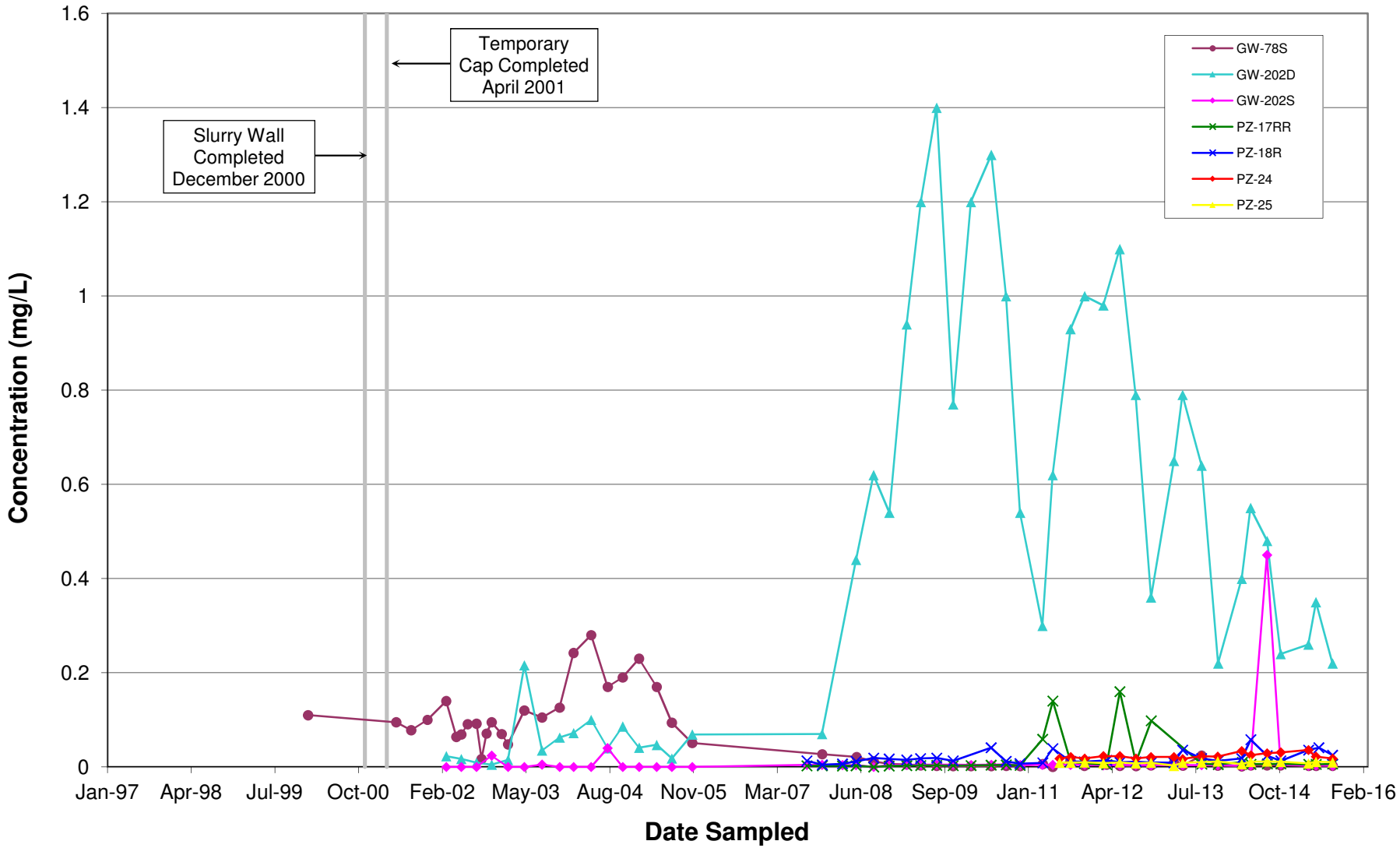


Filtered aluminum concentration of 38 mg/L detected at GW-34D on 1/19/00 not shown.

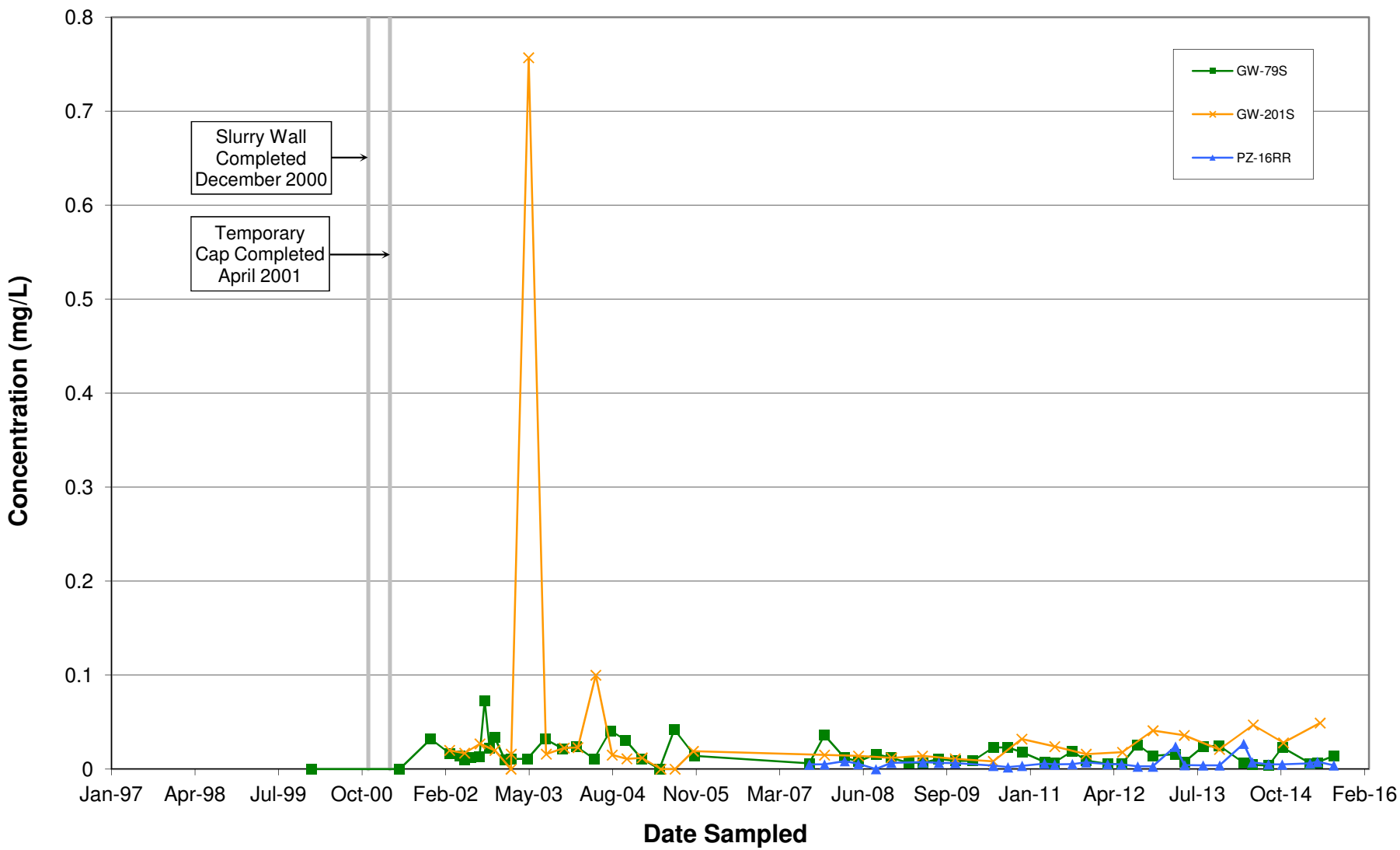
Semi-Annual Status Report No. 17 Olin Chemical Superfund Site Wilmington, Massachusetts	amec foster wheeler	Filtered Aluminum in Groundwater North of Containment Structure Figure D-1.4

P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum GW N

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17 Olin Chemical Superfund Site Wilmington, Massachusetts	amec foster wheeler	Filtered Chromium in Groundwater South of Containment Structure Figure D-1.5



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

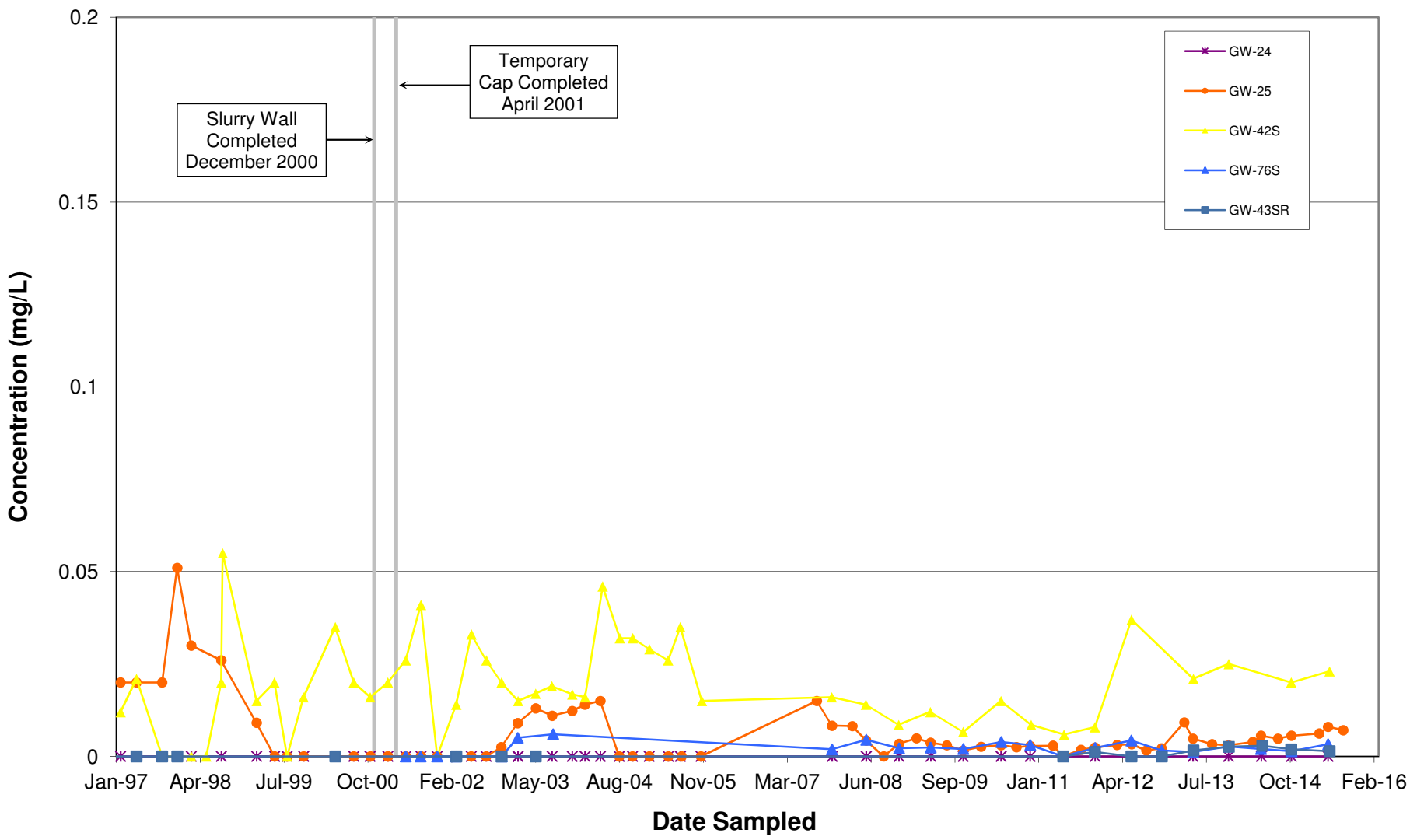
amec foster wheeler

Filtered Chromium in Groundwater
Southeast of Containment Structure

Figure D-1.6

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Dissolved Chromium GW SE

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

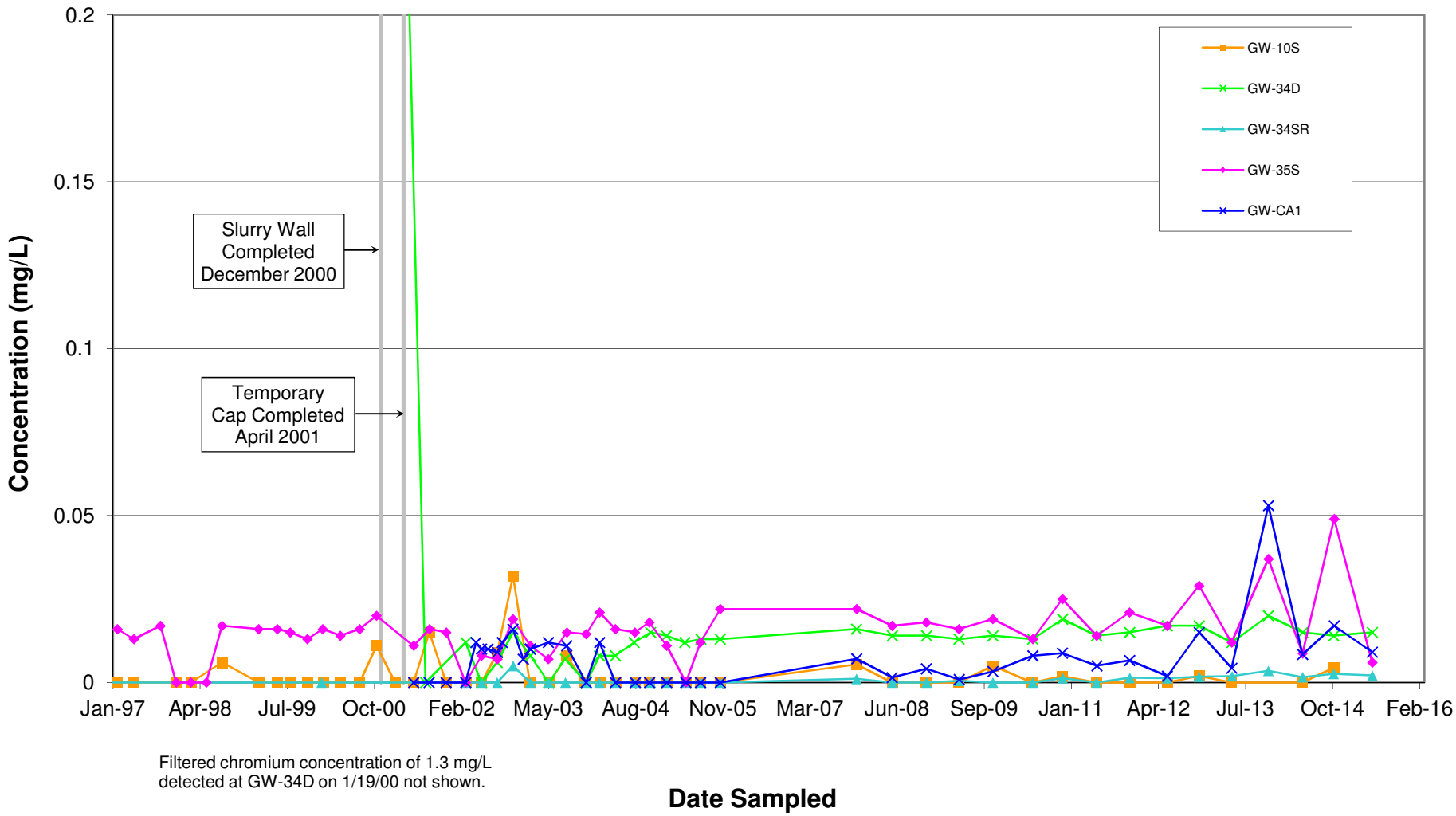
amec foster wheeler

Filtered Chromium in Groundwater
West of Containment Structure

Figure D-1.7

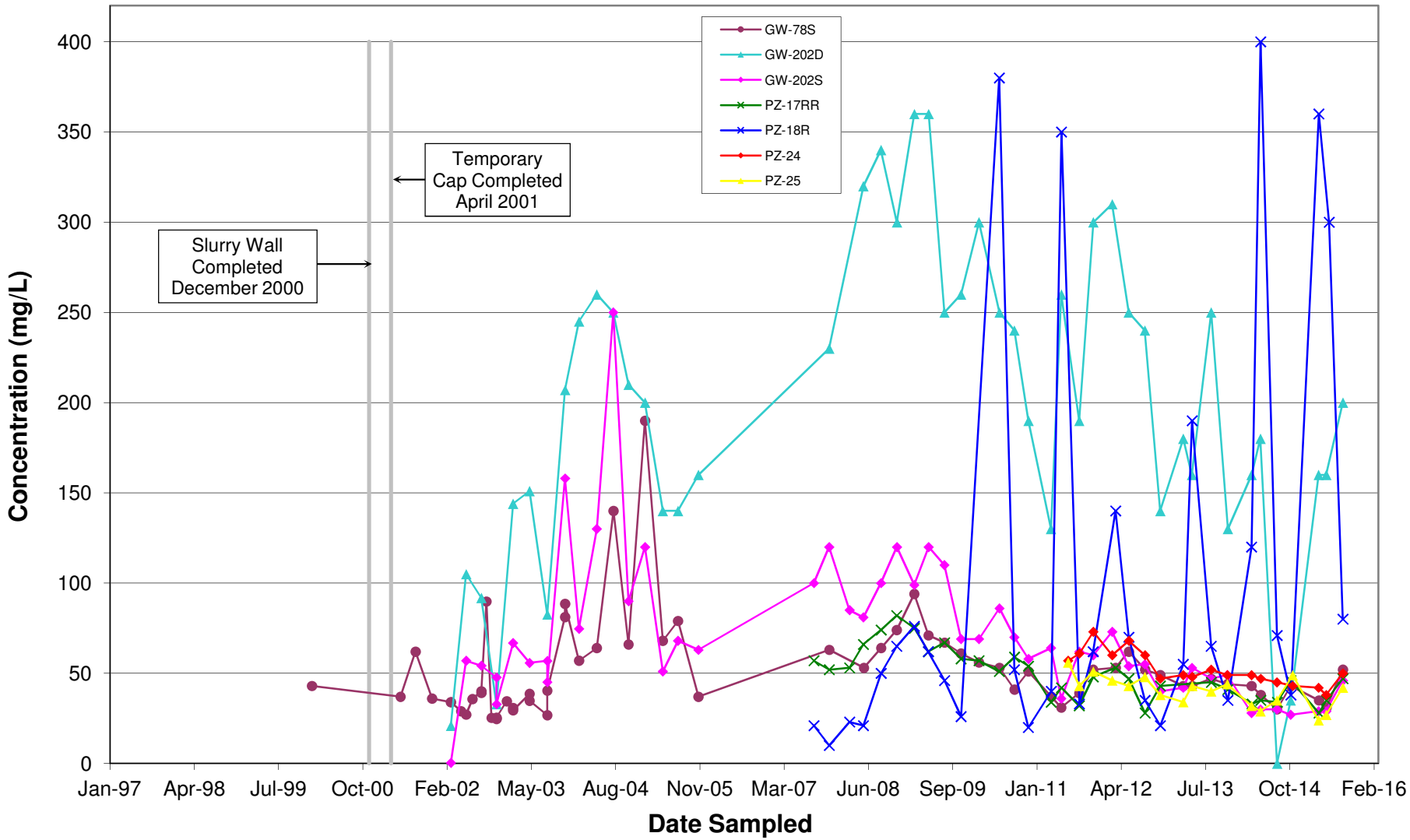
\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Dissolved Chromium GW W

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Filtered chromium concentration of 1.3 mg/L detected at GW-34D on 1/19/00 not shown.

Semi-Annual Status Report No. 17 Olin Chemical Superfund Site Wilmington, Massachusetts	amec foster wheeler	Filtered Chromium in Groundwater North of Containment Structure Figure D-1.8



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

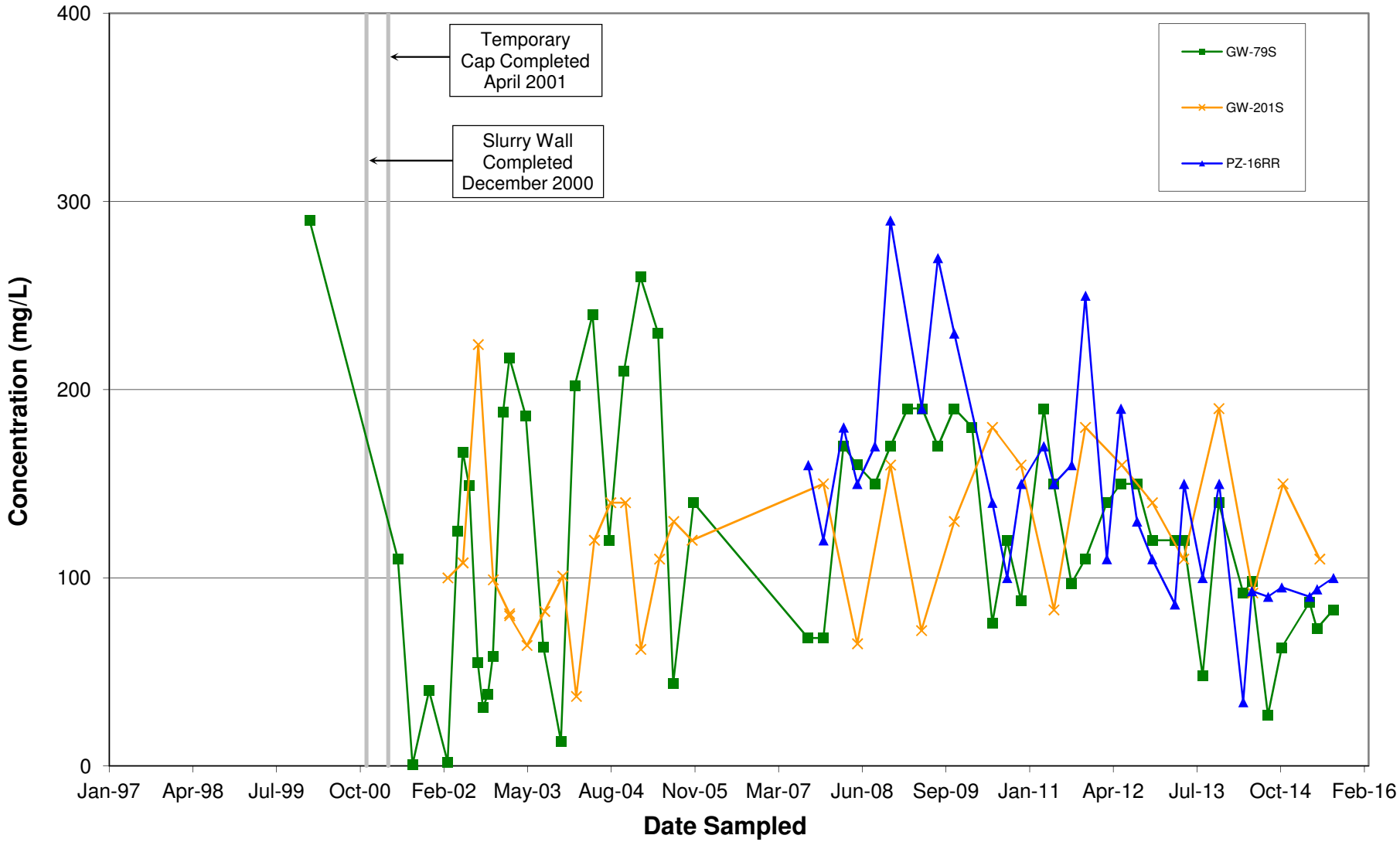
amec foster wheeler

Ammonia in Groundwater
South of Containment Structure

Figure D-1.9

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia GW S

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

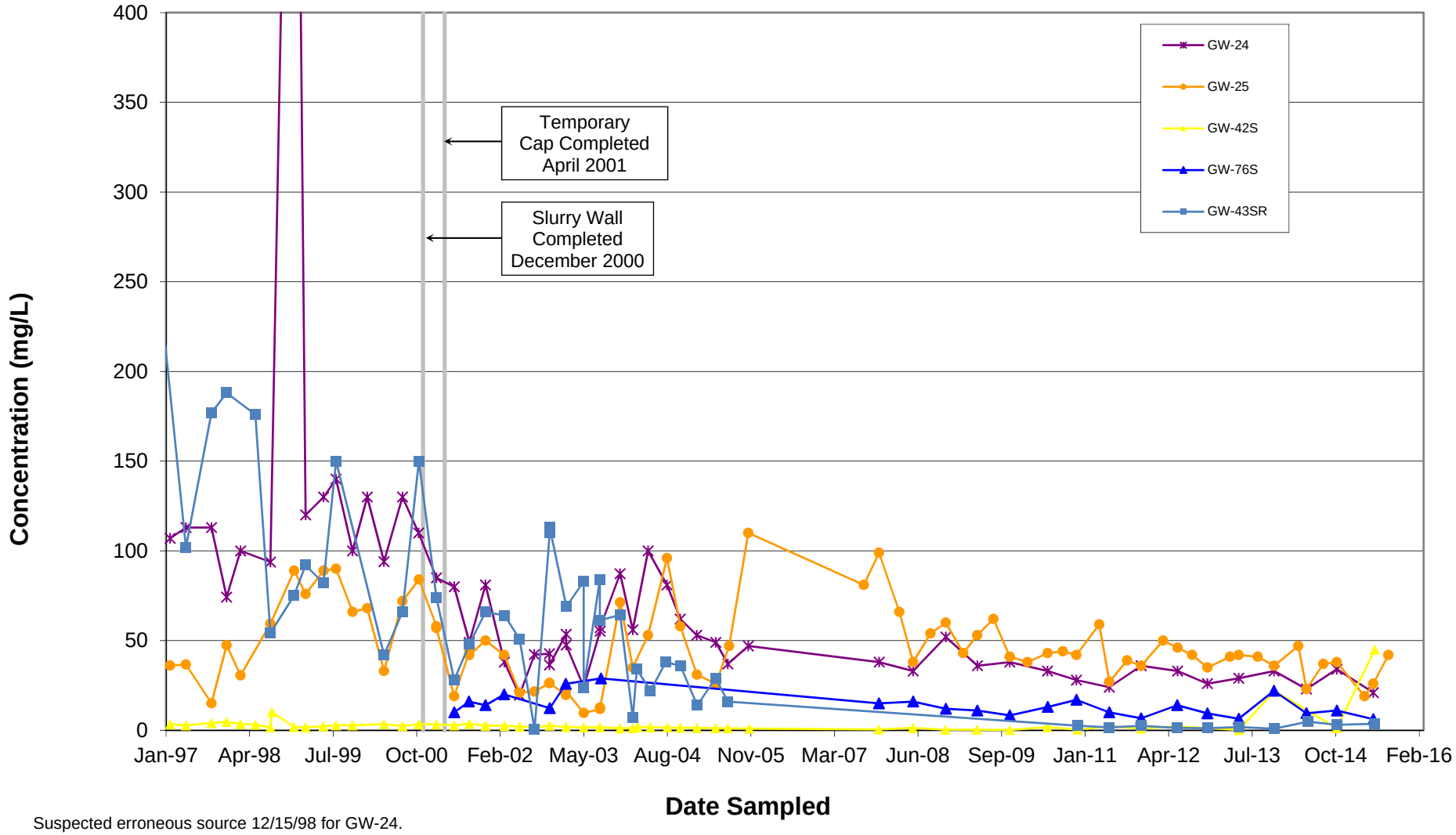
amec foster wheeler

Ammonia in Groundwater
Southeast of Containment Structure

Figure D-1.10

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia GW SE

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015

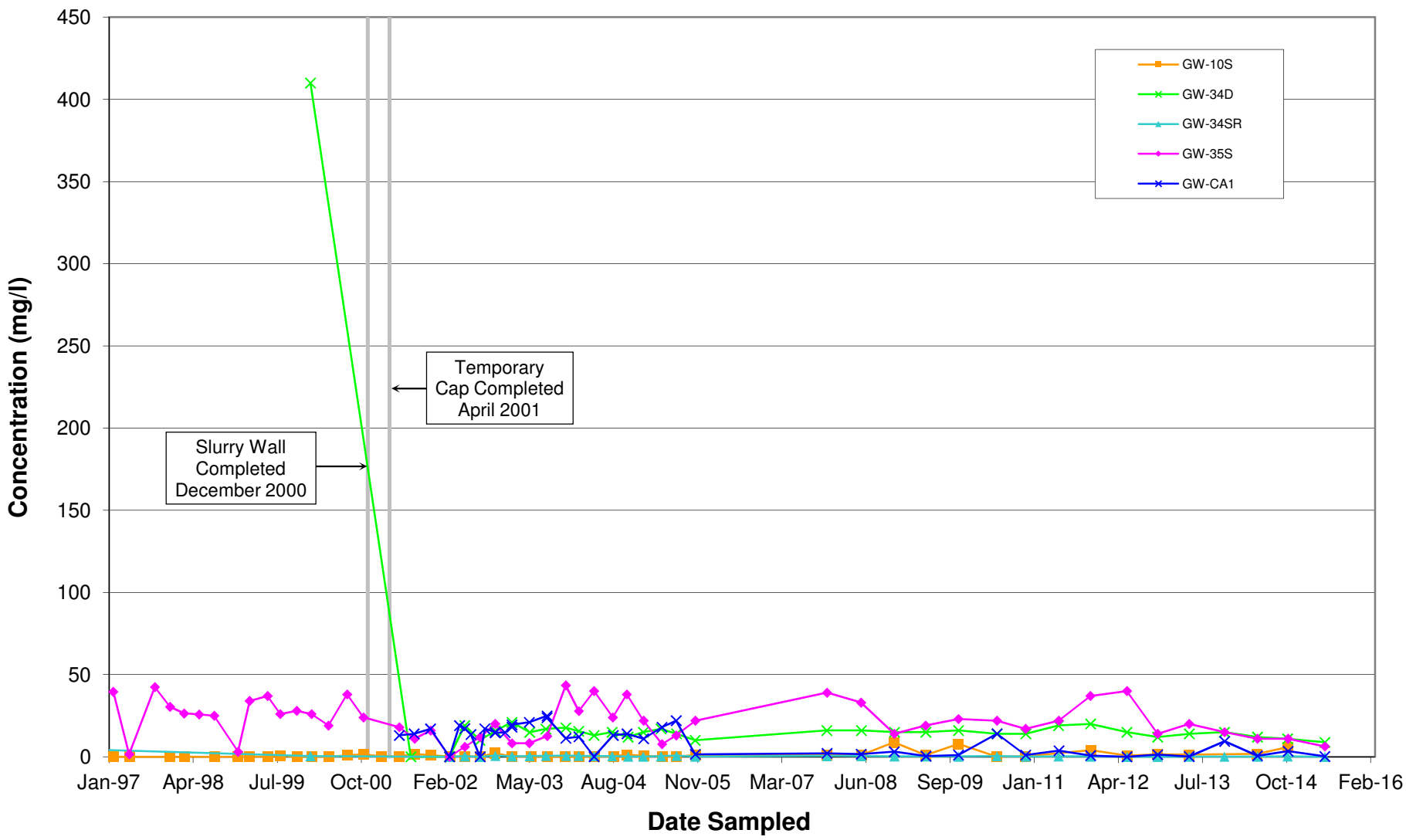


Suspected erroneous source 12/15/98 for GW-24.

Semi-Annual Status Report No. 17 Olin Chemical Superfund Site Wilmington, Massachusetts	amec foster wheeler	Ammonia in Groundwater West of Containment Structure Figure D-1.11

P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia GW W

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

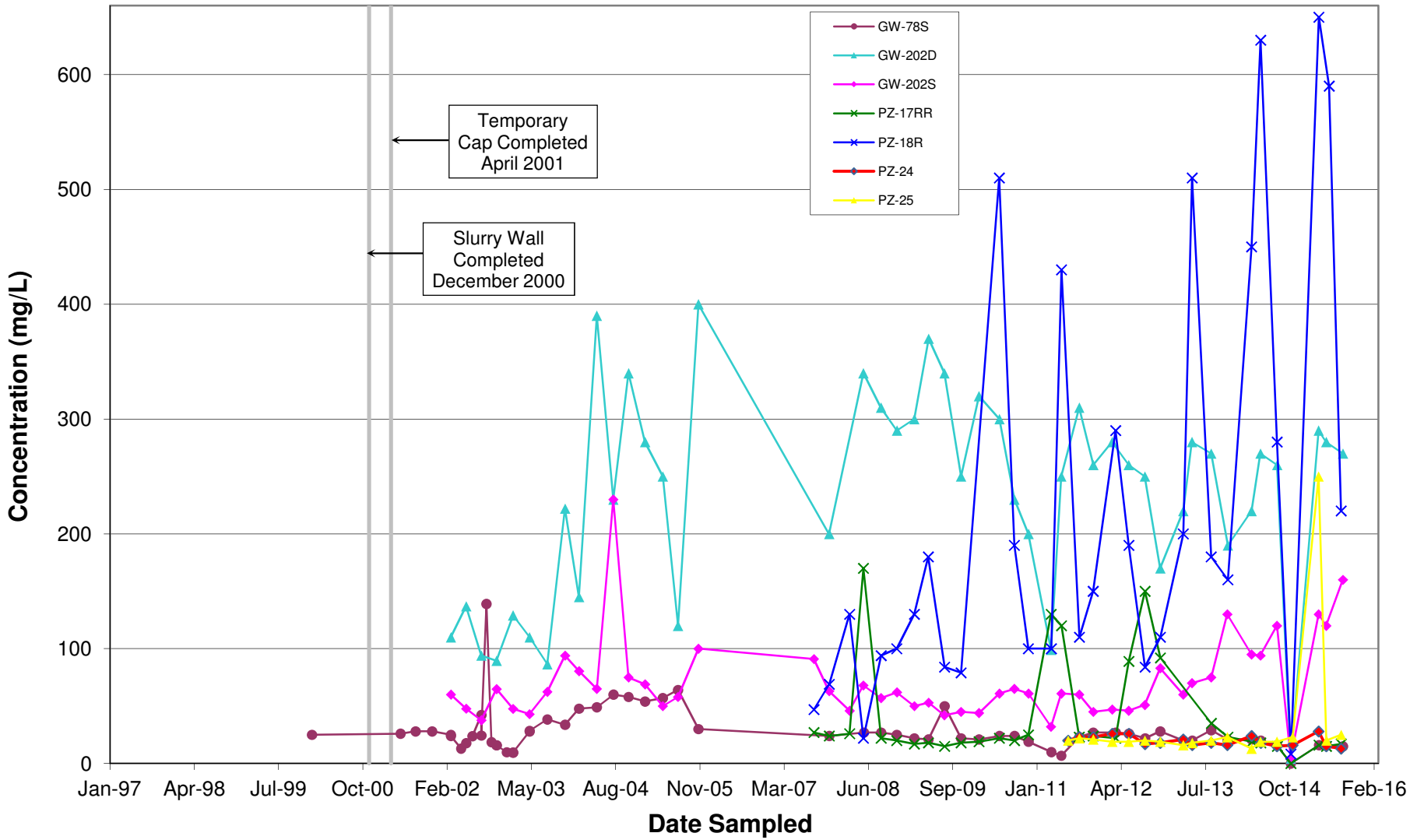
amec foster wheeler

Ammonia in Groundwater
North of Containment Structure

Figure D-1.12

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia GW N

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

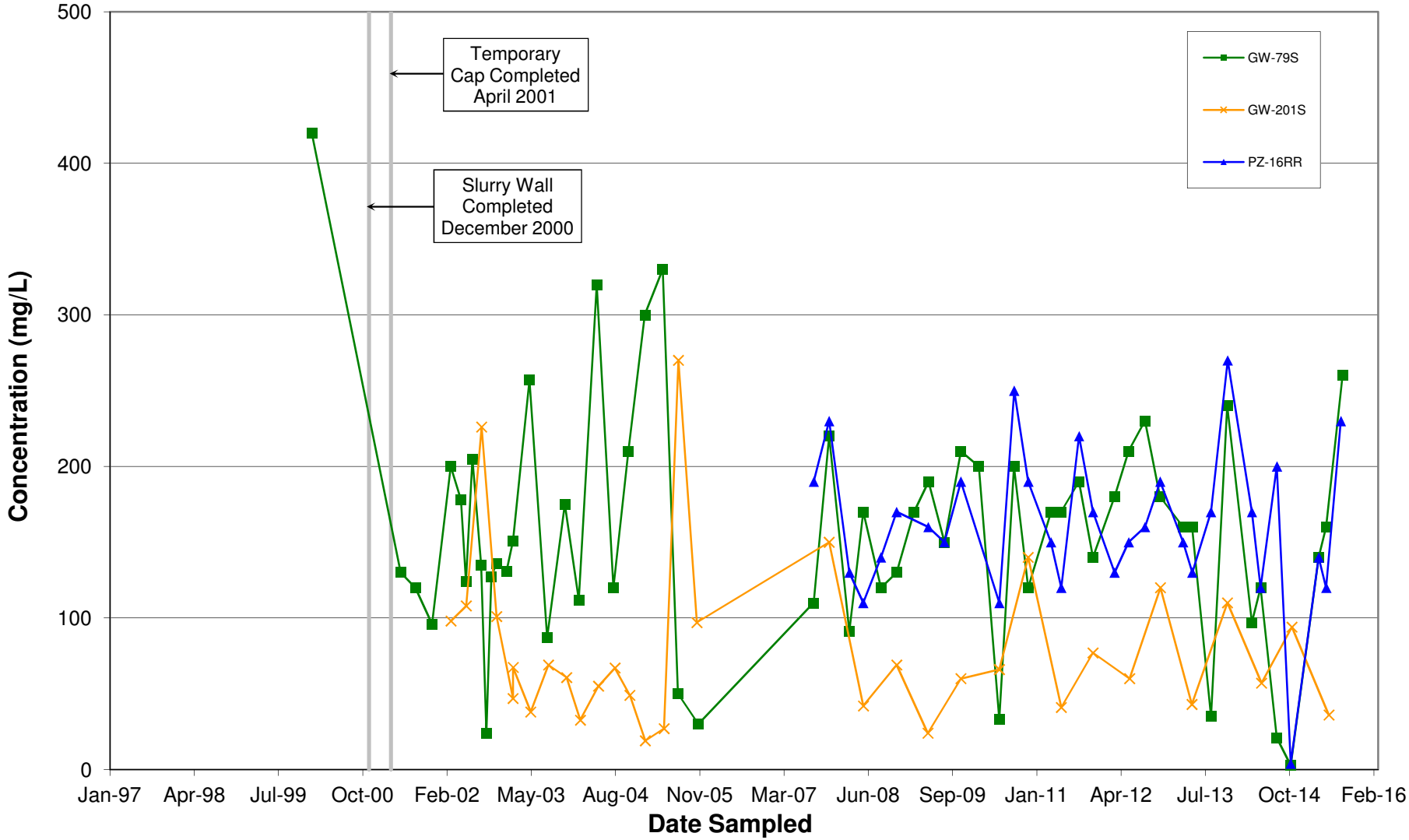
amec foster wheeler

Chloride in Groundwater
South of Containment Structure

Figure D-1.13

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride GW S

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

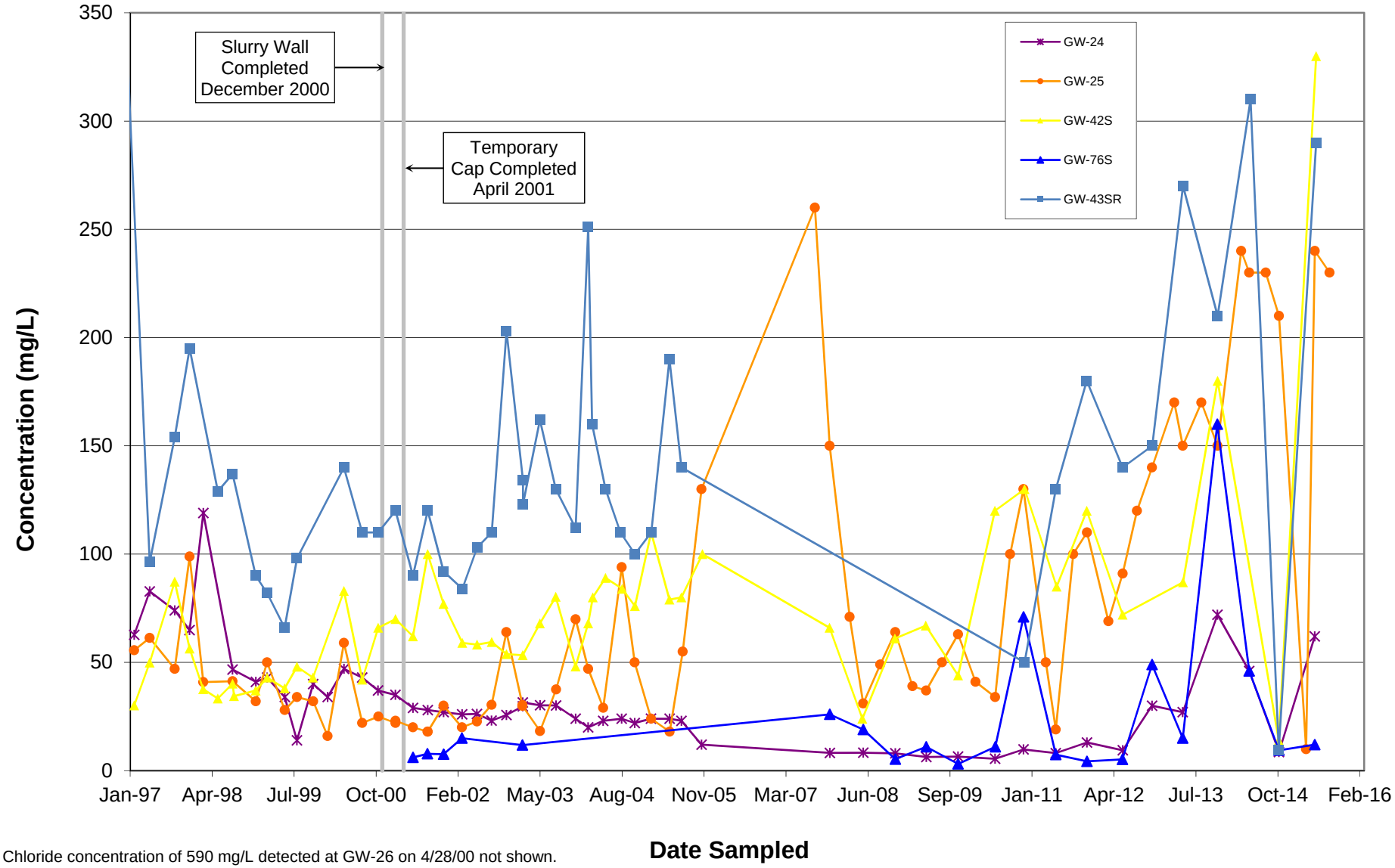
amec foster wheeler

Chloride in Groundwater
Southeast of Containment Structure

Figure D-1.14

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride GW SE

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015

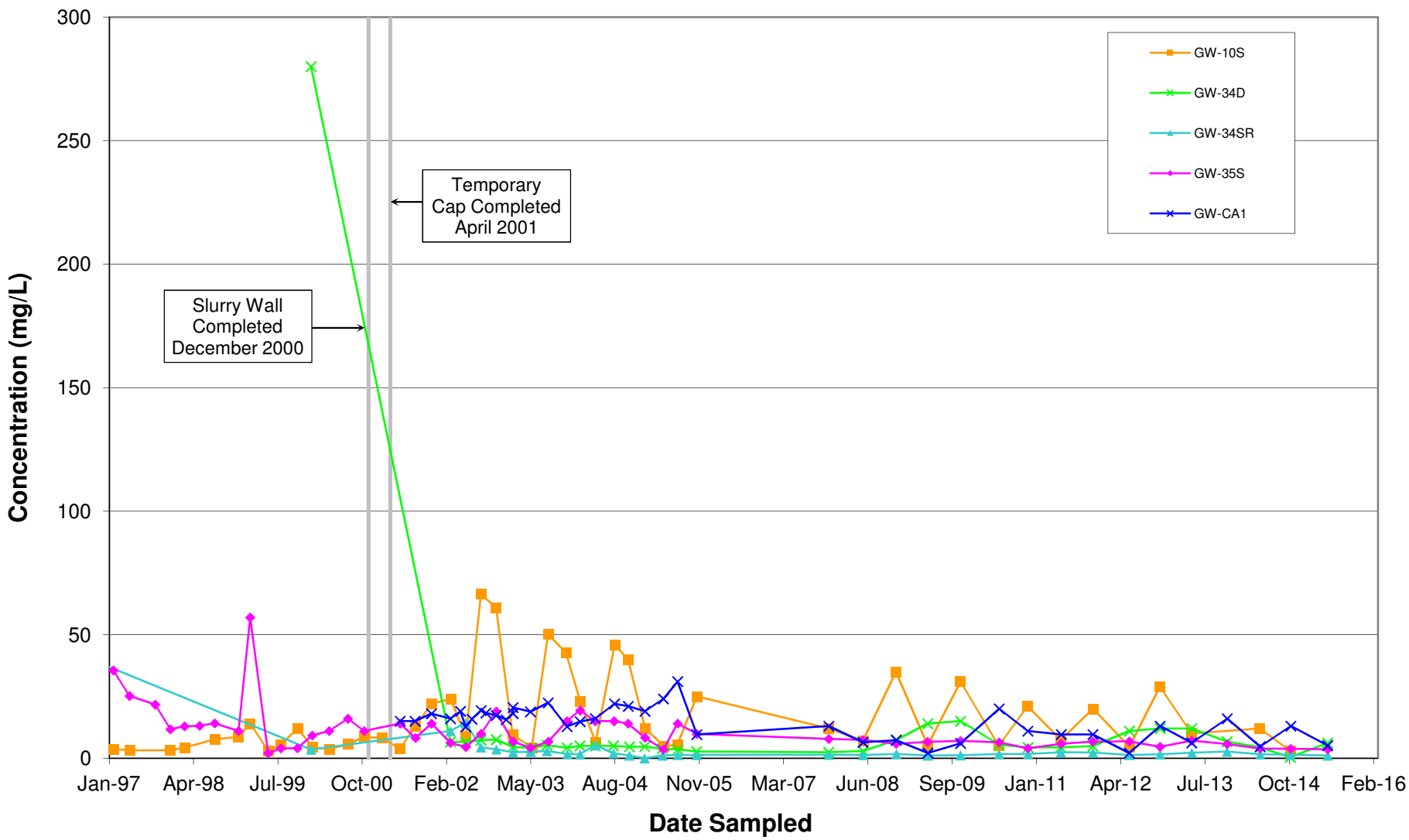


Chloride concentration of 590 mg/L detected at GW-26 on 4/28/00 not shown.

Semi-Annual Status Report No. 17 Olin Chemical Superfund Site Wilmington, Massachusetts	amec foster wheeler	Chloride in Groundwater West of Containment Structure Figure D-1.15

P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\
GW_SW Time Series Plots DAPL constituents.xls, Chloride GW W

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

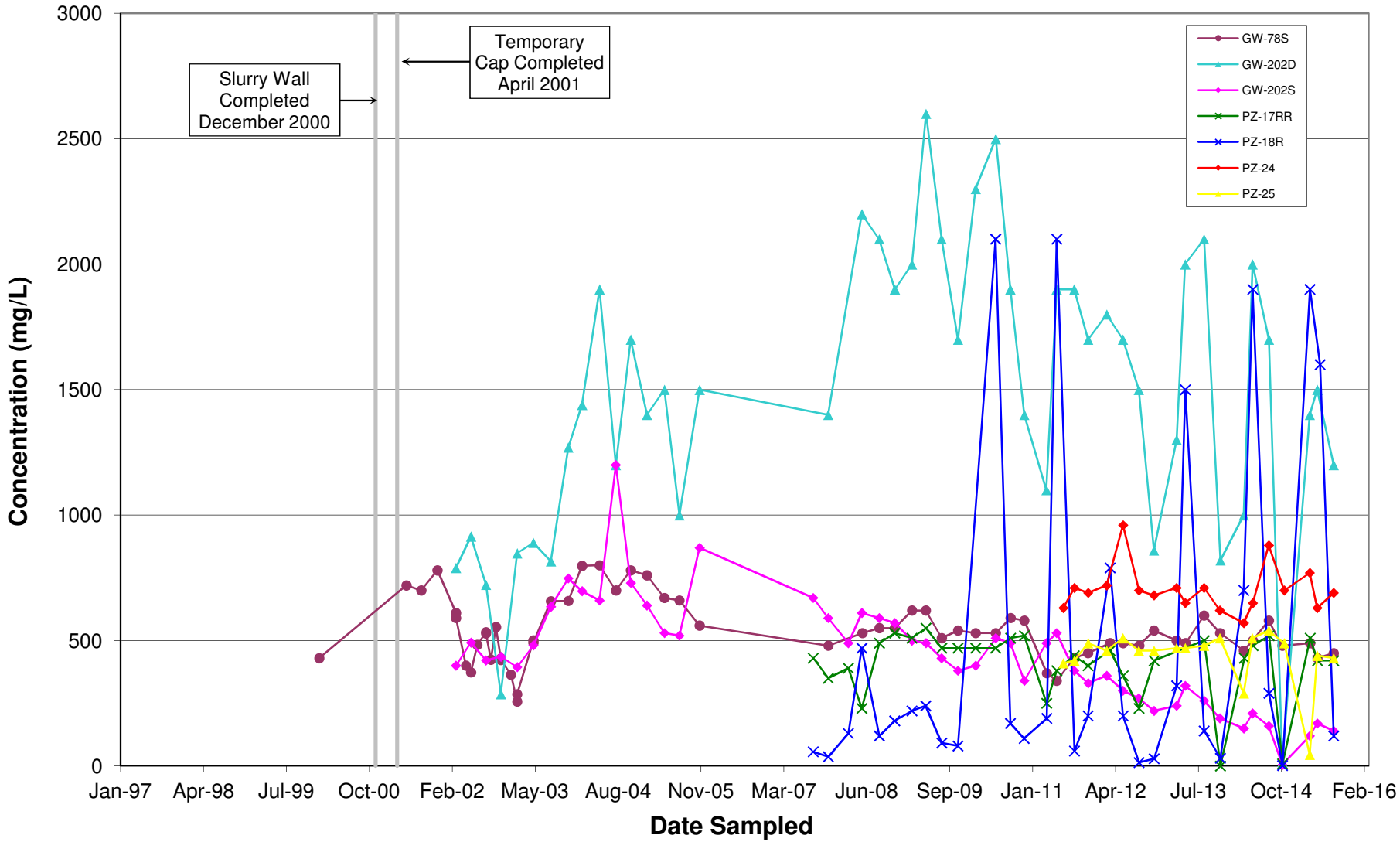
amec foster wheeler

Chloride in Groundwater
North of Containment Structure

Figure D-1.16

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride GW N

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

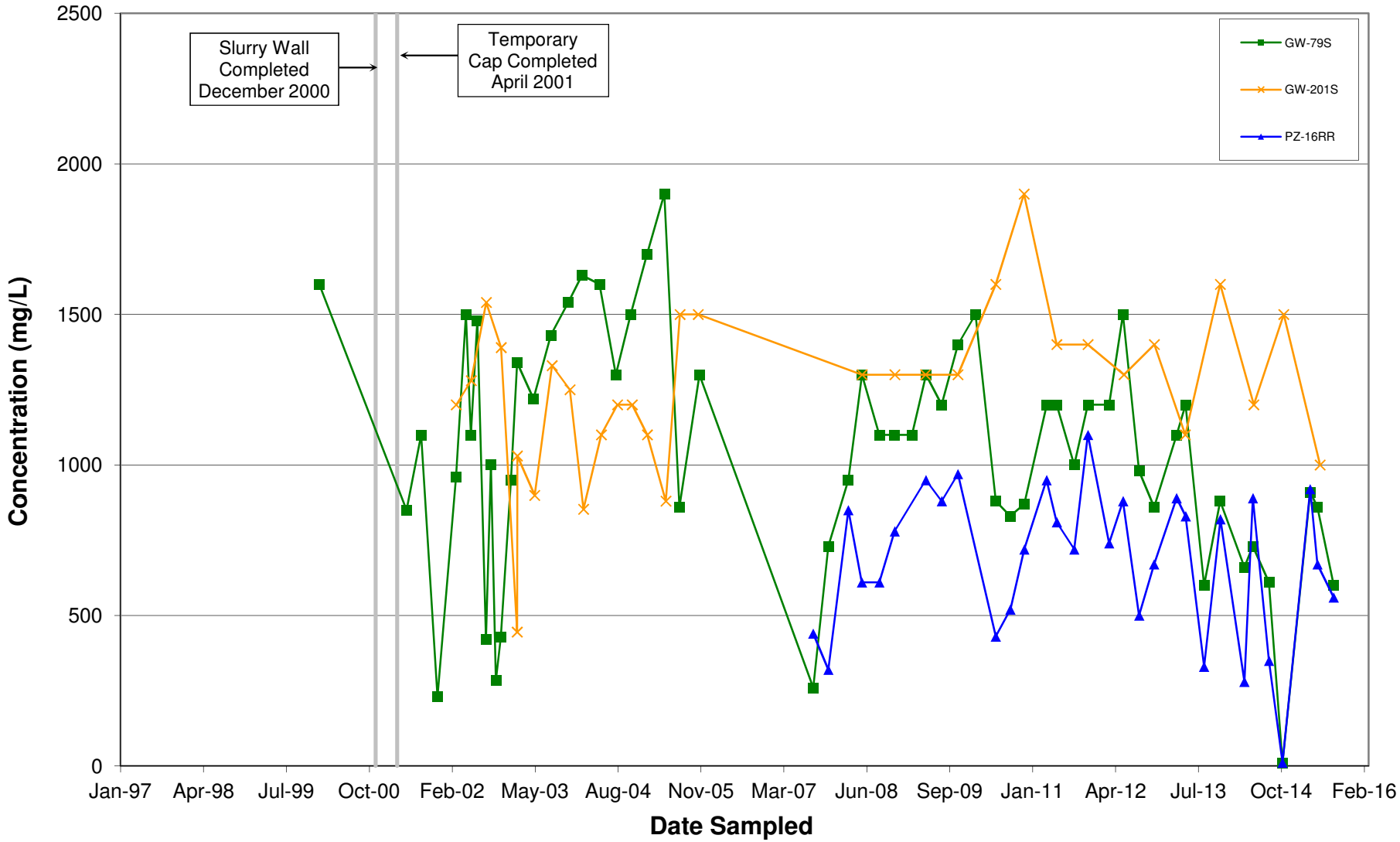
amec foster wheeler

Sulfate in Groundwater
South of Containment Structure

Figure D-1.17

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate GW S

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

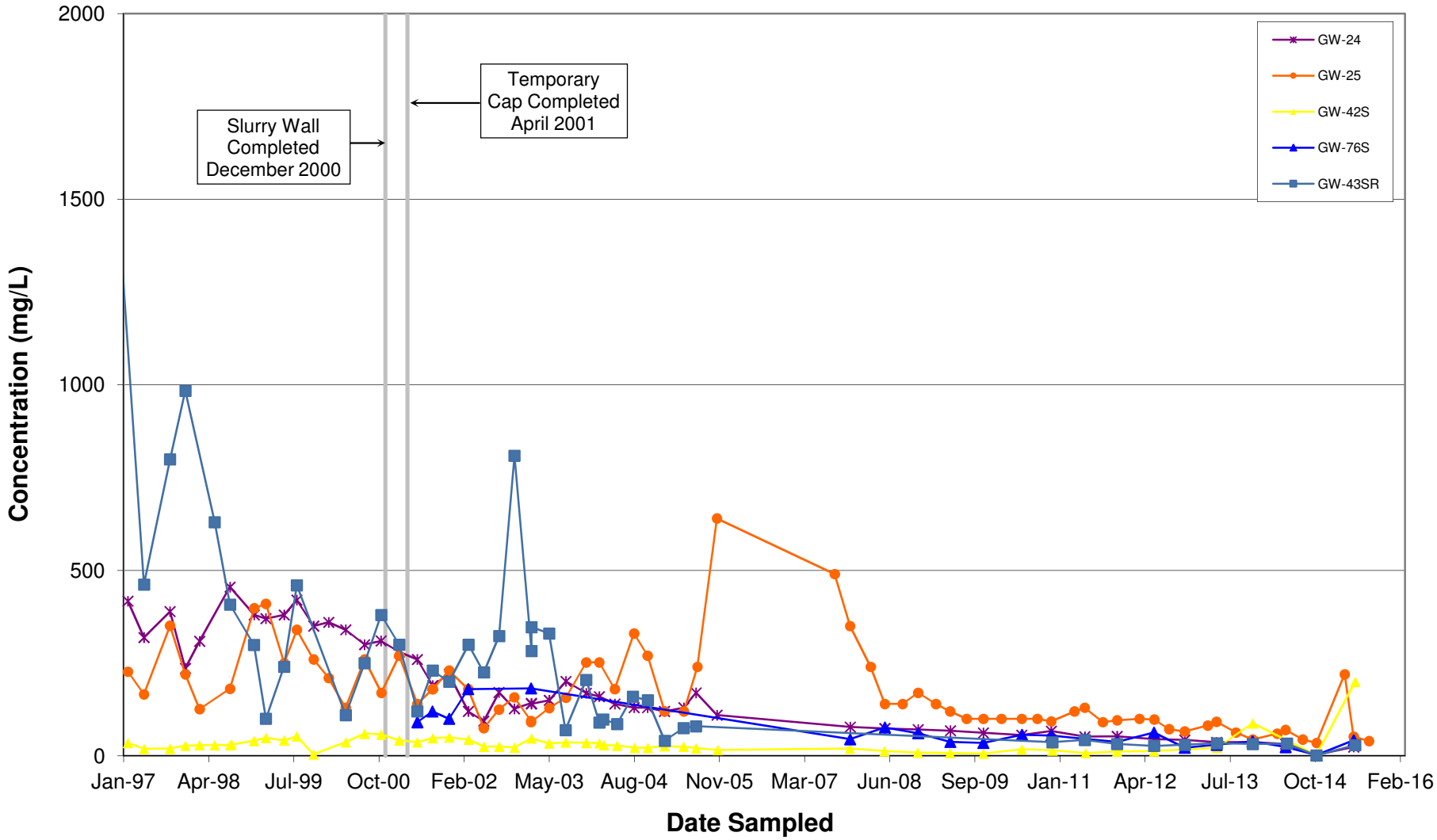
amec foster wheeler

Sulfate in Groundwater
Southeast of Containment Structure

Figure D-1.18

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate GW SE

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

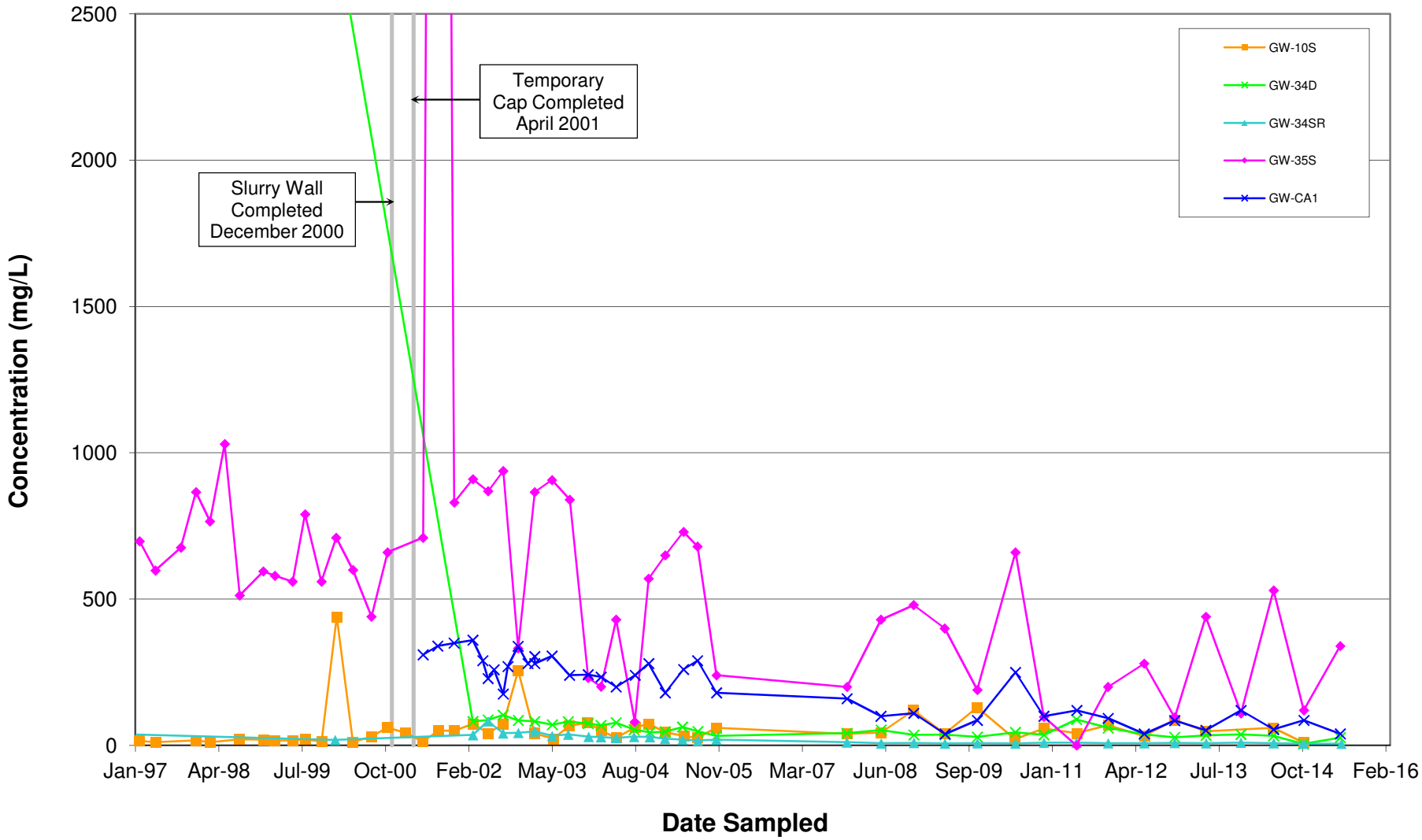
amec foster wheeler

Sulfate in Groundwater
West of Containment Structure

Figure D-1.19

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate GW W

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

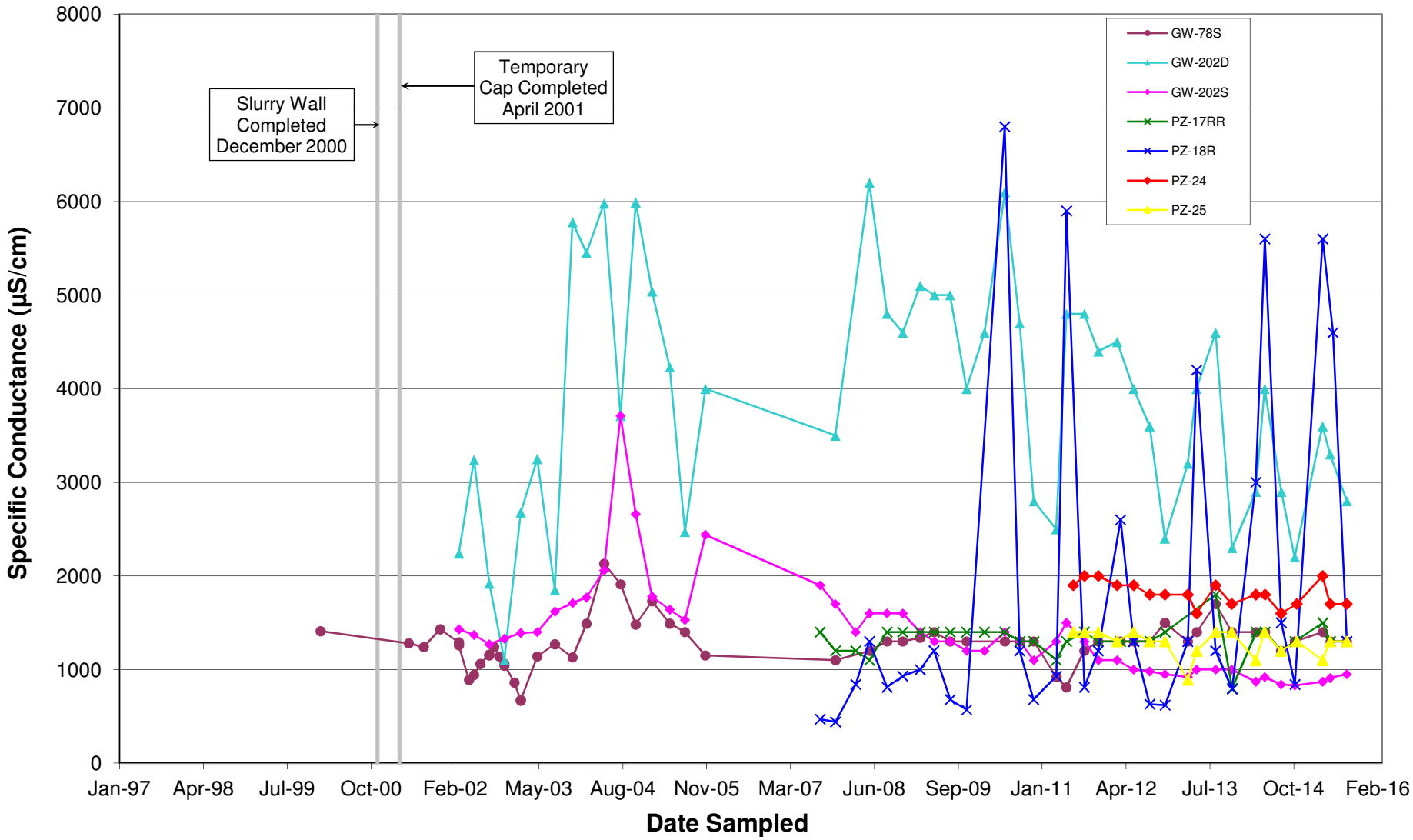
amec foster wheeler

Sulfate in Groundwater
North of Containment Structure

Figure D-1.20

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate GW N

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

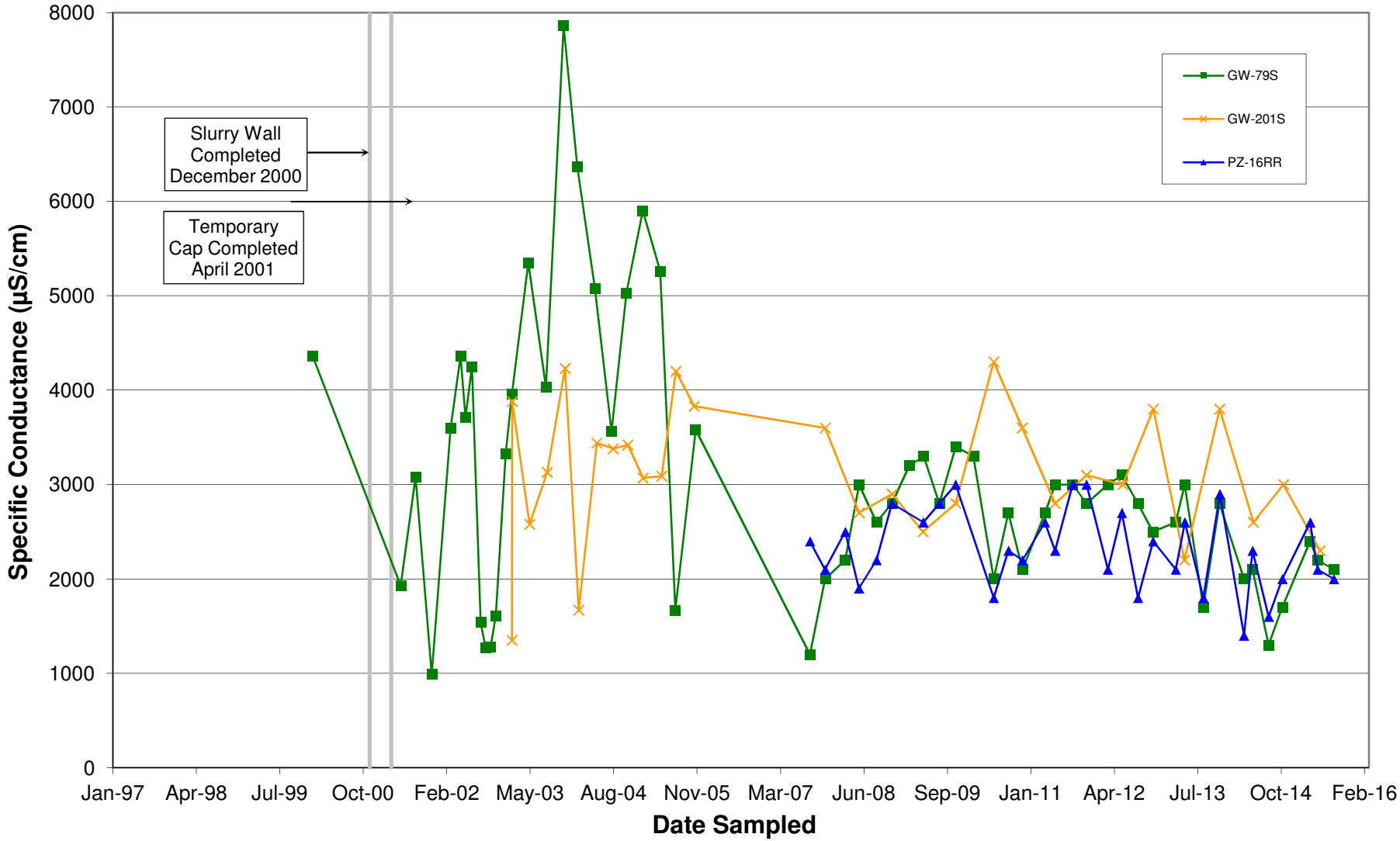
amec foster wheeler

Specific Conductance in Groundwater
South of Containment Structure

Figure D-1.21

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Specific Conductance GW S

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015

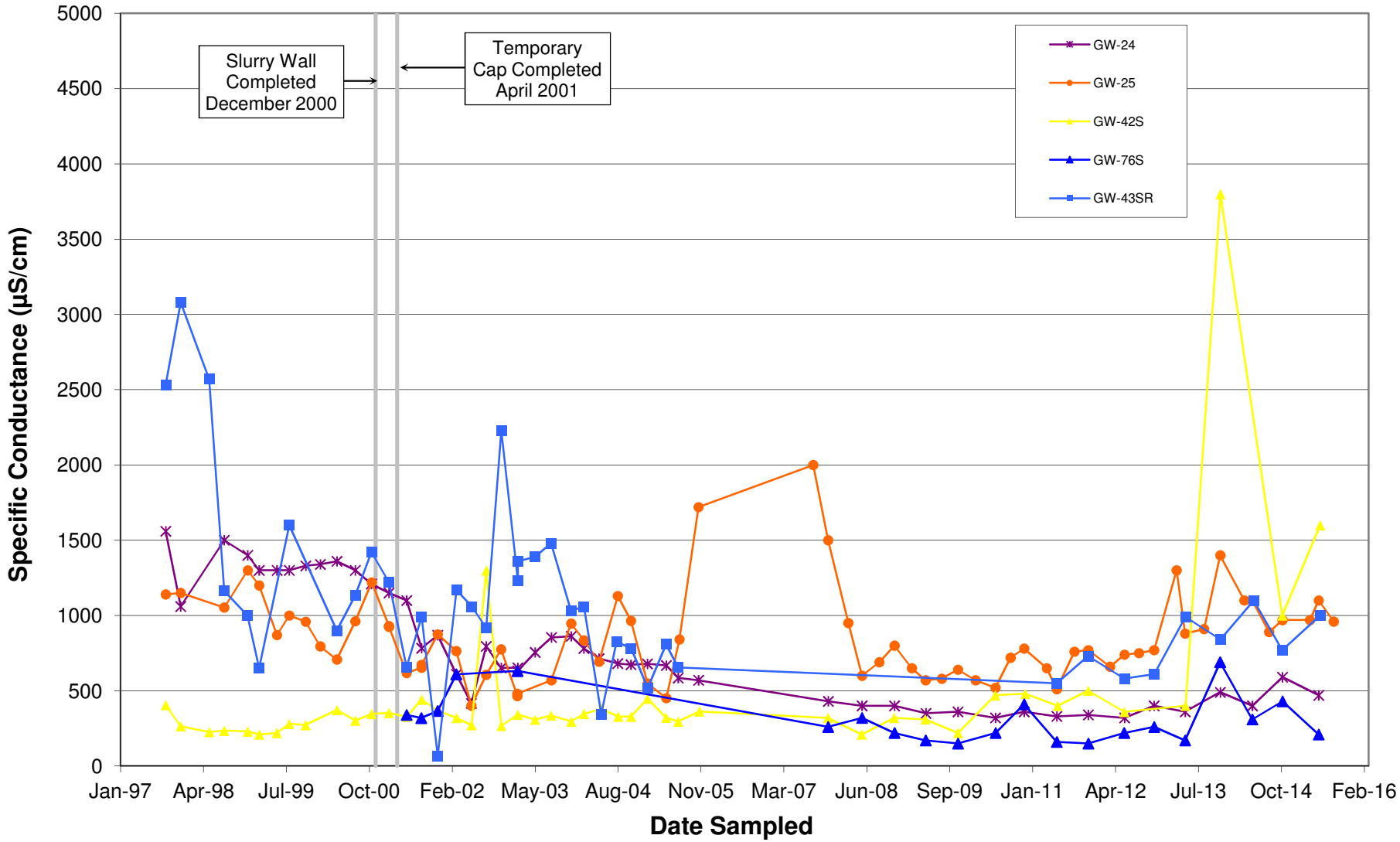


Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

amec foster wheeler

Specific Conductance in Groundwater
Southeast of Containment Structure

Figure D-1.22



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

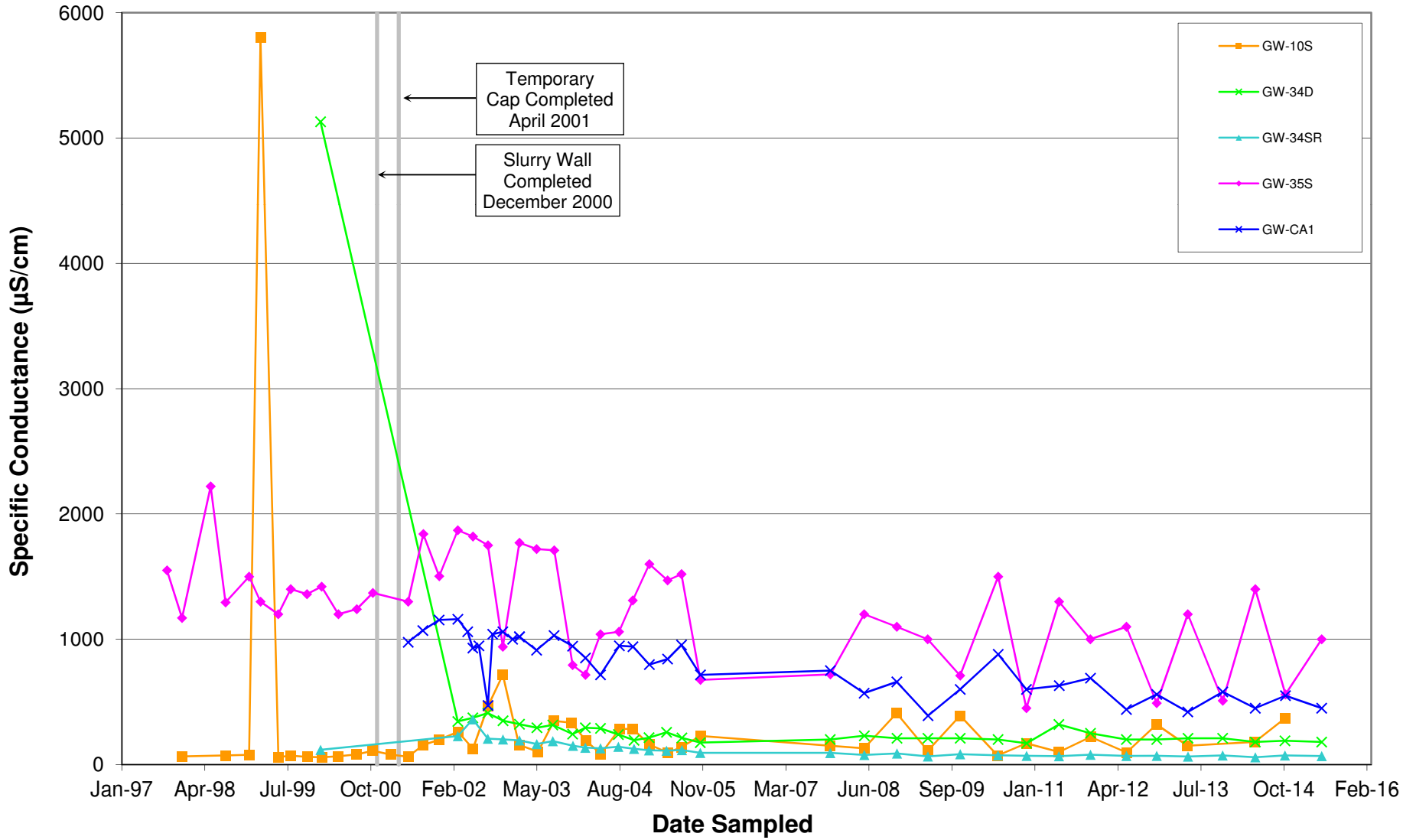
amec foster wheeler

Specific Conductance in Groundwater
West of Containment Structure

Figure D-1.23

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Specific Conductance GW W

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

amec foster wheeler

Specific Conductance in Groundwater
North of Containment Structure

Figure D-1.24

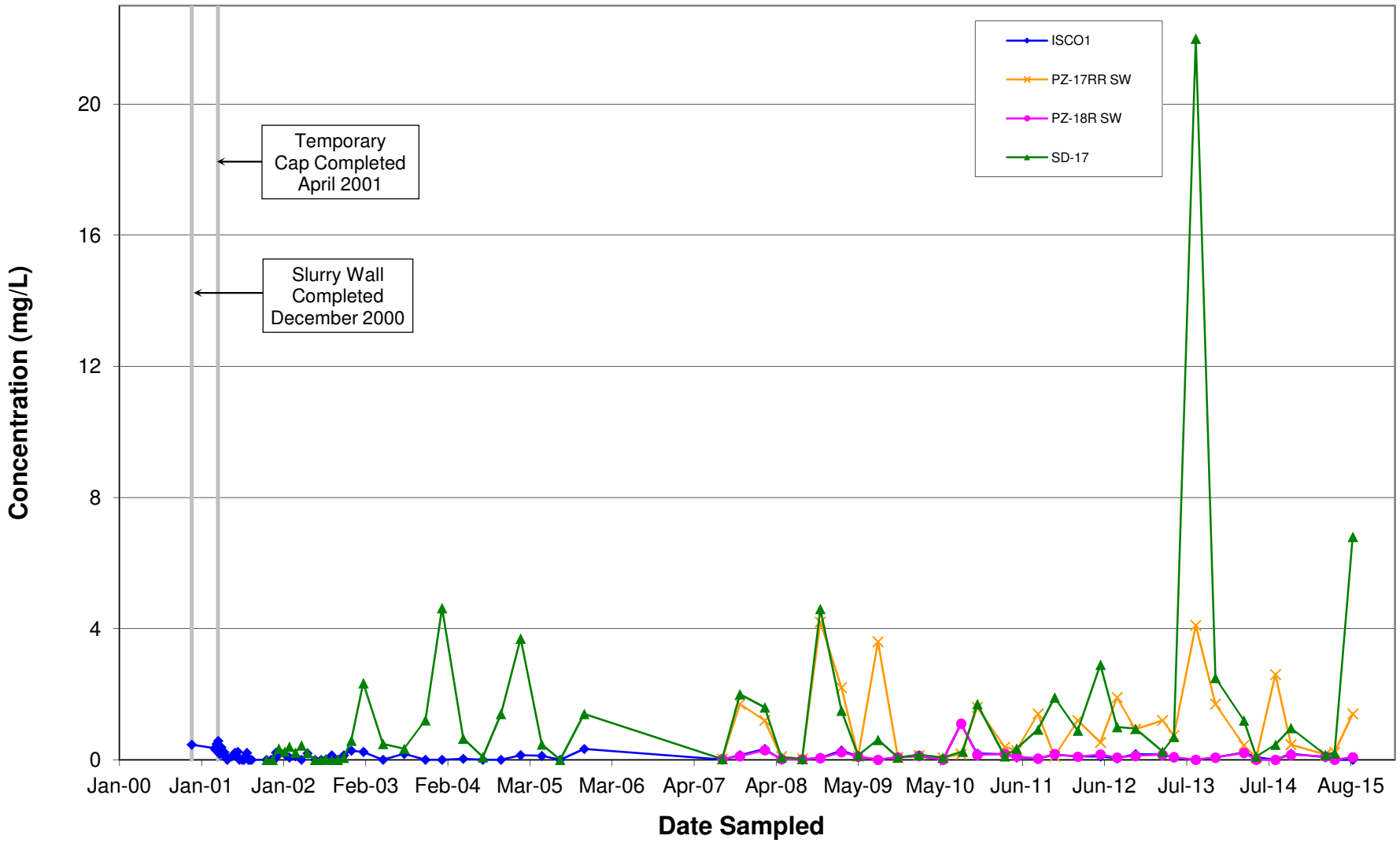
\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Specific Conductance GW N

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015

APPENDIX D

Slurry Wall/Cap Groundwater and Surface Water Time Series Plots

D-2 Surface Water (Aluminum, Ammonia, Chloride, Chromium, Sulfate)



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

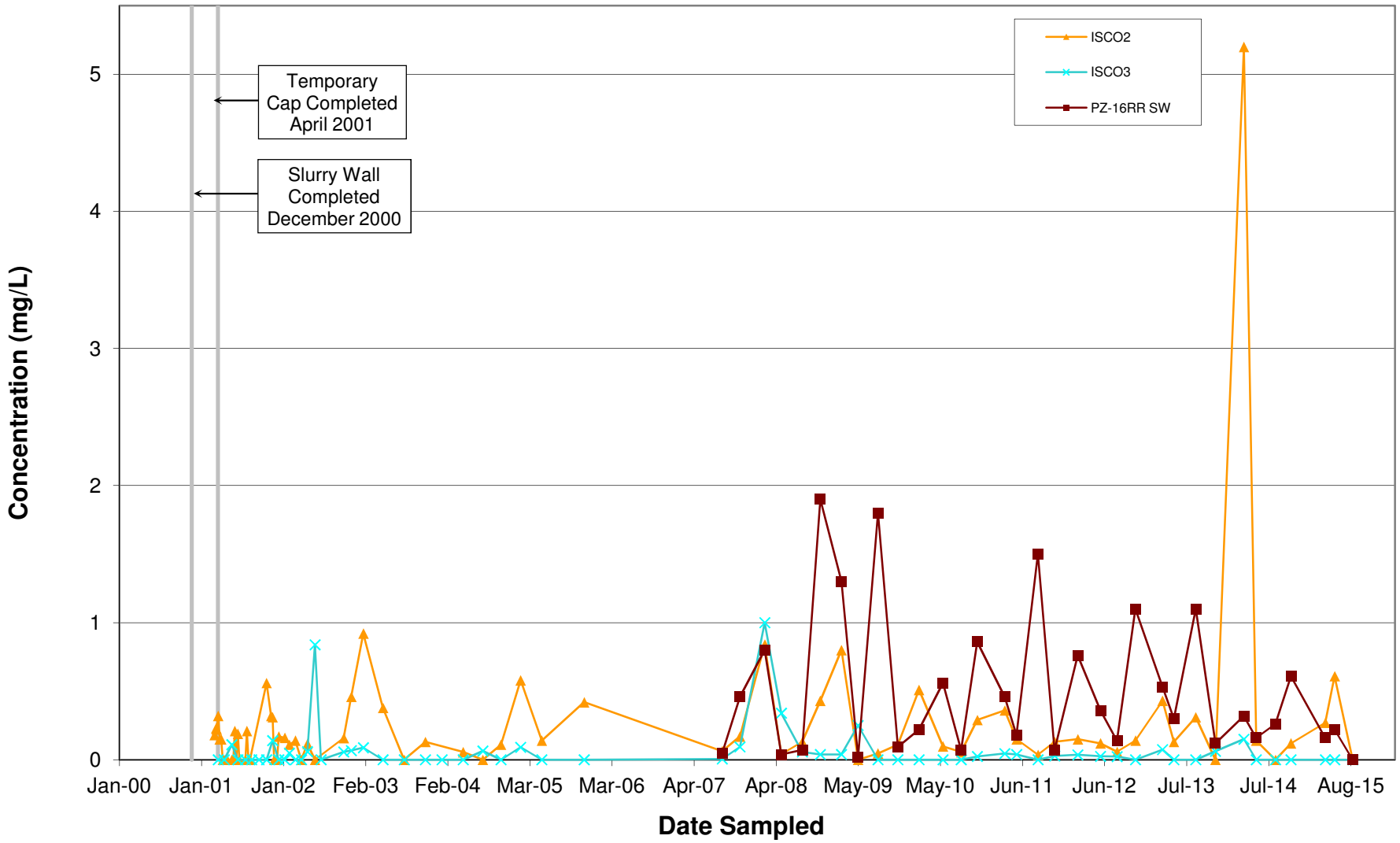
amec foster wheeler

Filtered Aluminum in Surface Water
in the Upper South Ditch

Figure D-2.1

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum SW UpperSD

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

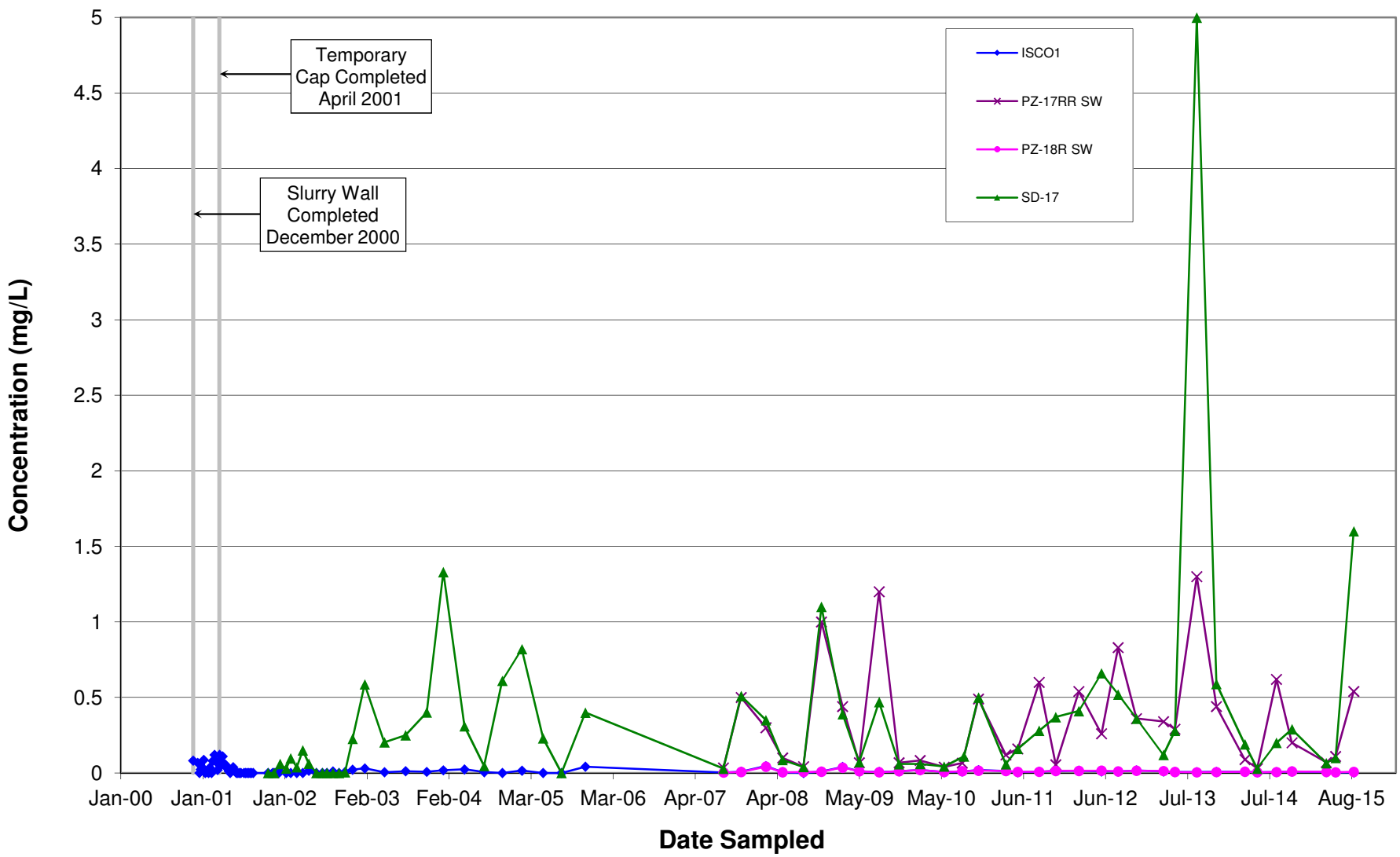
amec foster wheeler

Filtered Aluminum in Surface Water
in the Lower South Ditch

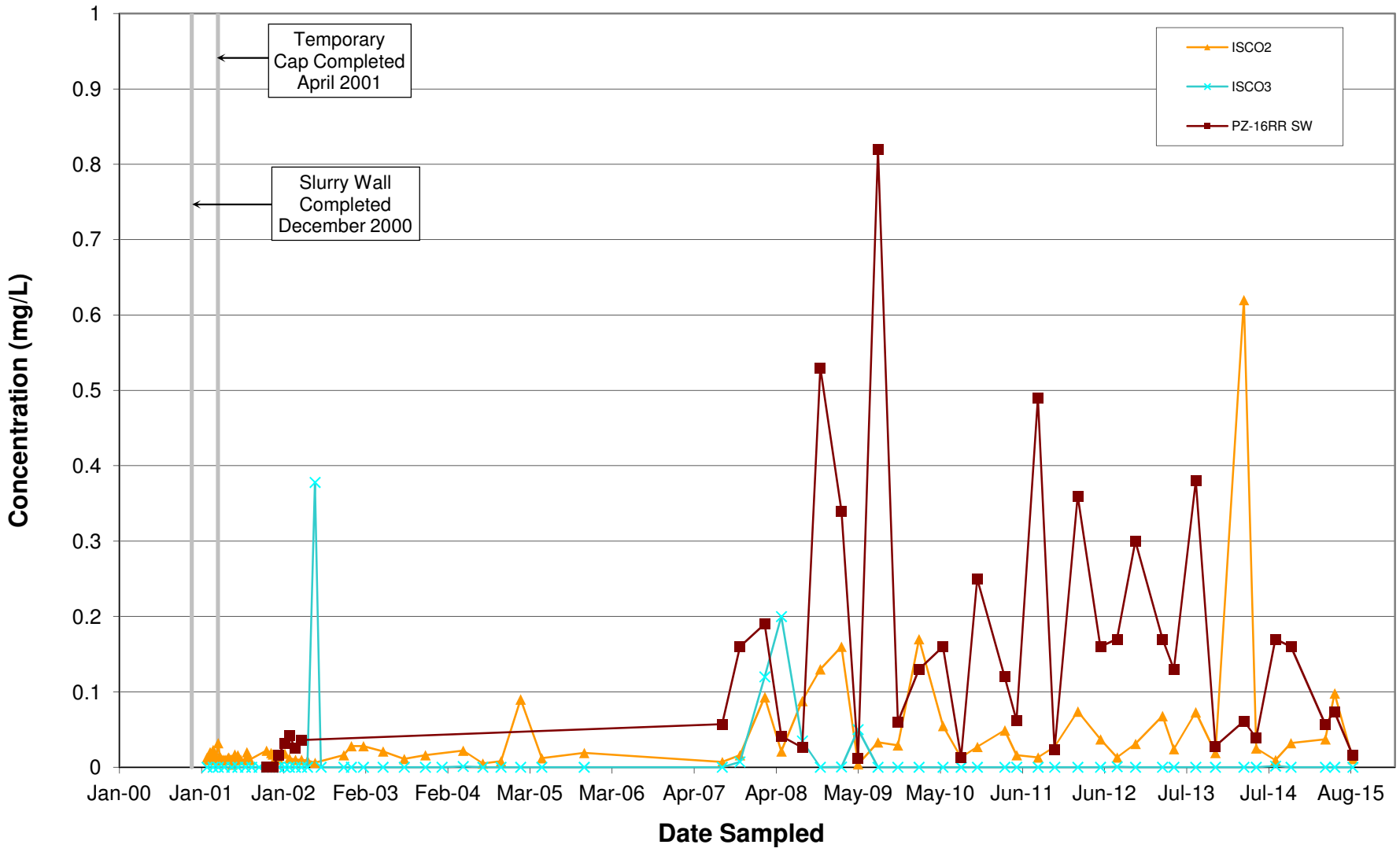
Figure D-2.2

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum SW LowerSD

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17 Olin Chemical Superfund Site Wilmington, Massachusetts	amec foster wheeler	Filtered Chromium in Surface Water in the Upper South Ditch Figure D-2.3



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

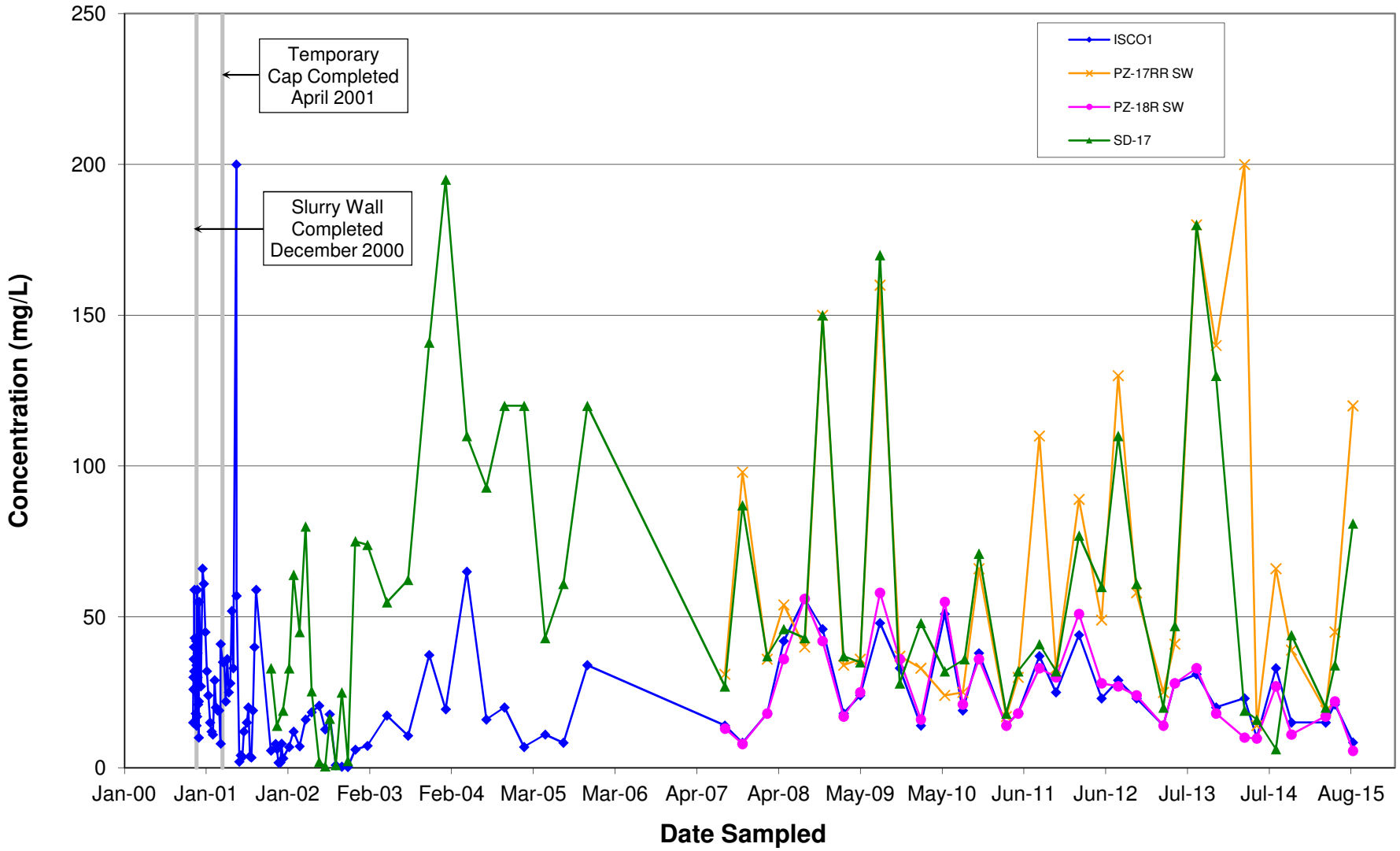
amec foster wheeler

Filtered Chromium in Surface Water
in the Lower South Ditch

Figure D-2.4

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Dissolved Chromium SW LowerSD

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

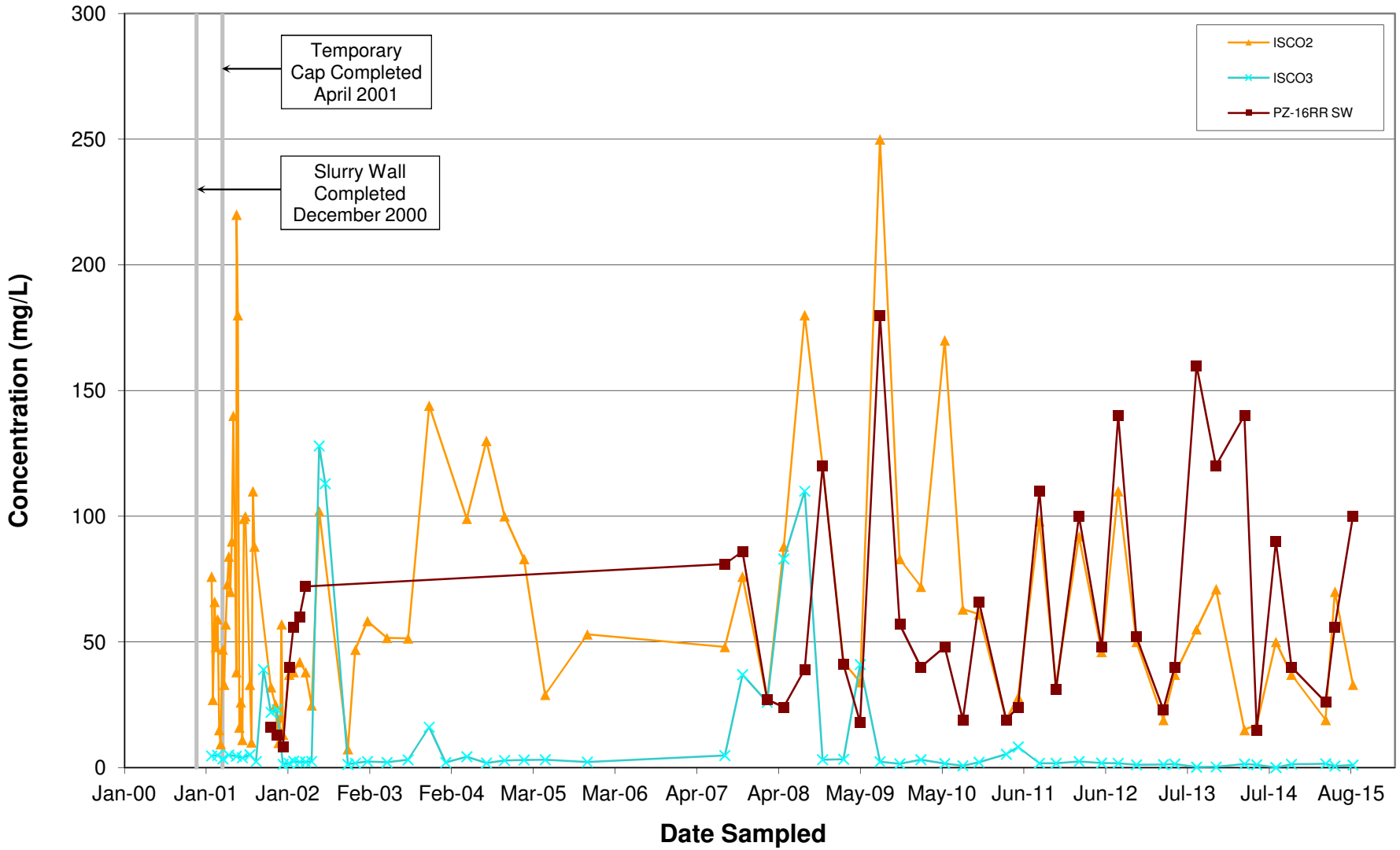
amec foster wheeler

Ammonia in Surface Water
in the Upper South Ditch

Figure D-2.5

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia SW UpperSD

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

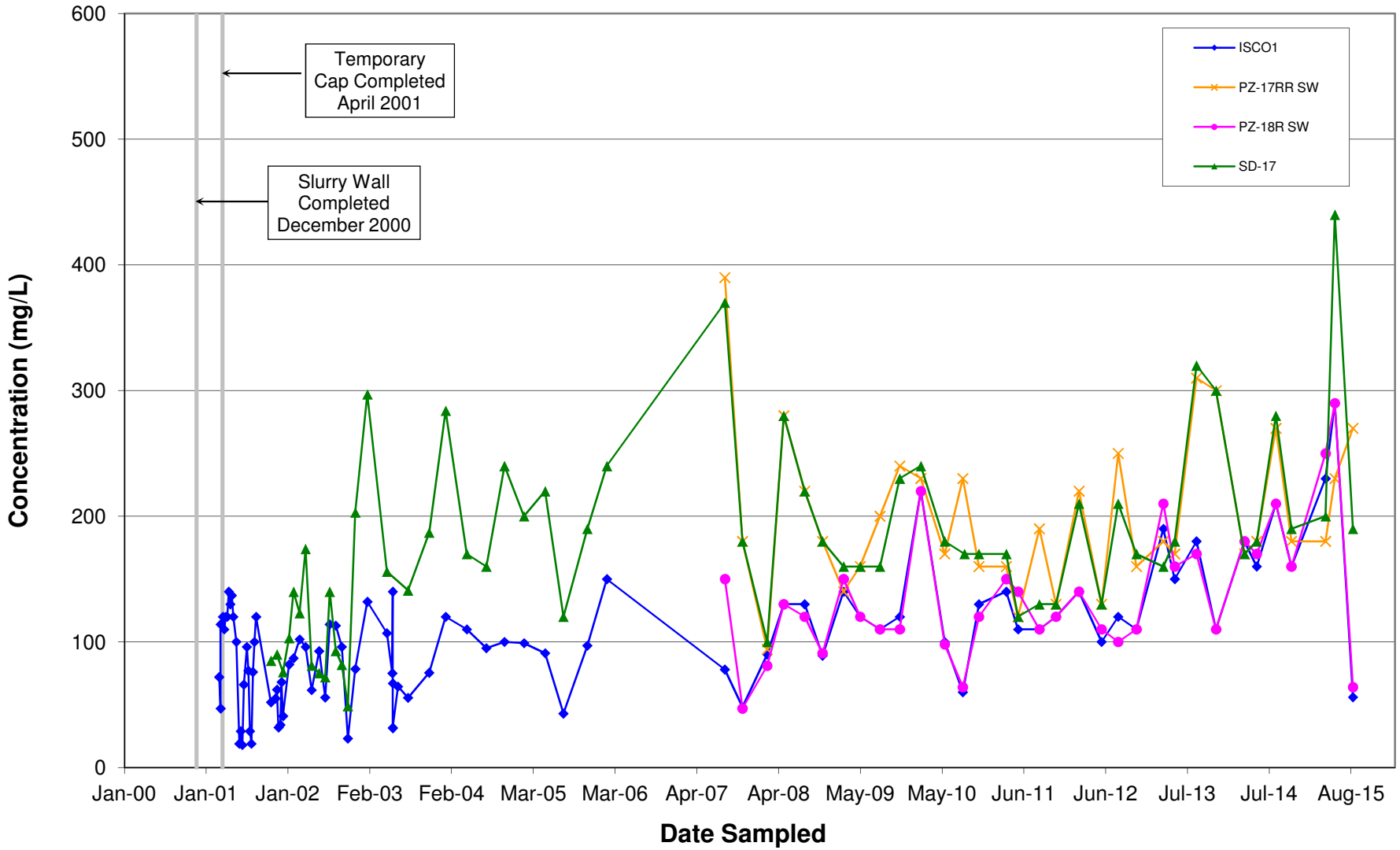
amec foster wheeler

Ammonia in Surface Water
in the Lower South Ditch

Figure D-2.6

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia SW LowerSD

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

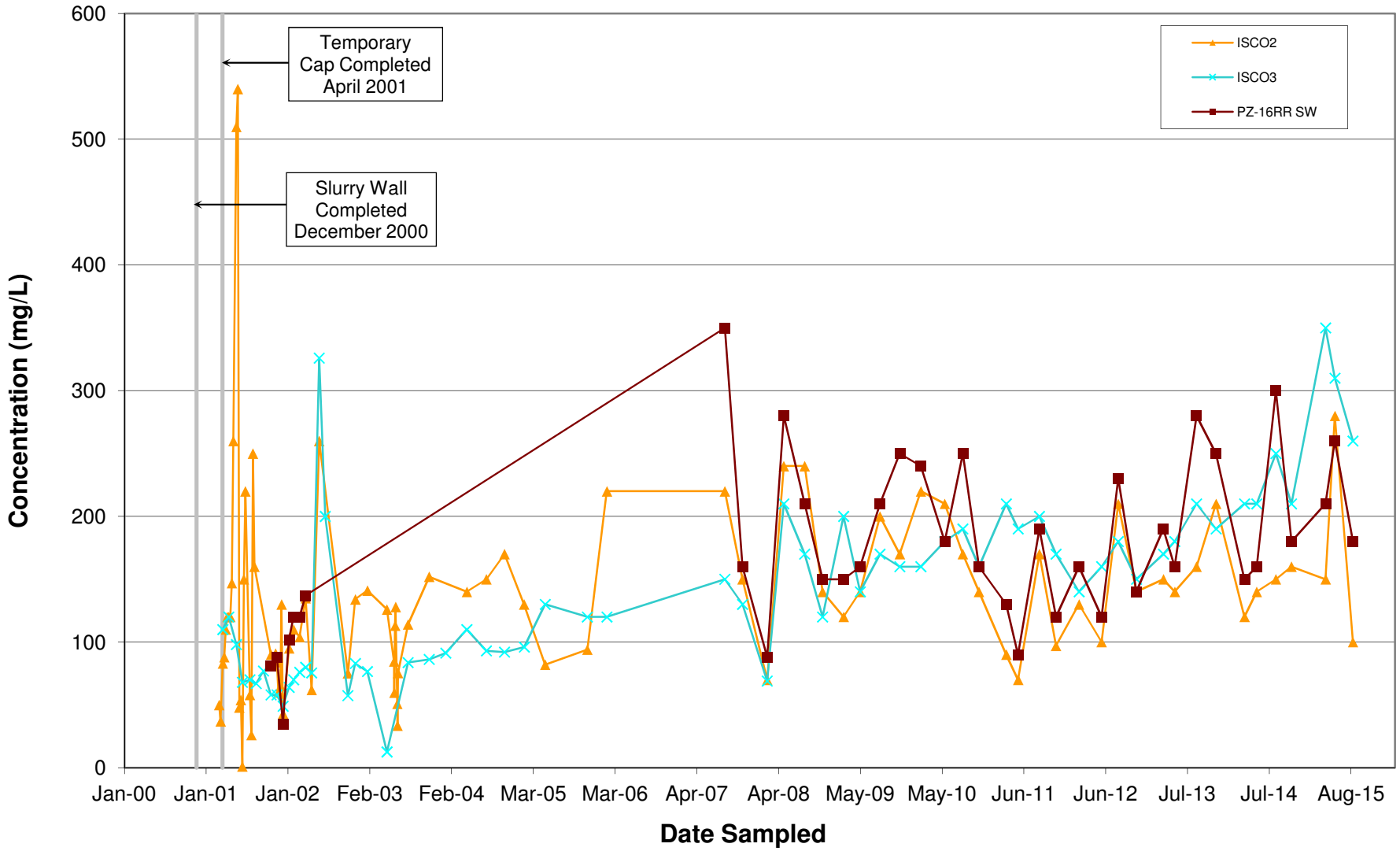
amec foster wheeler

Chloride in Surface Water
in the Upper South Ditch

Figure D-2.7

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride SW UpperSD

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

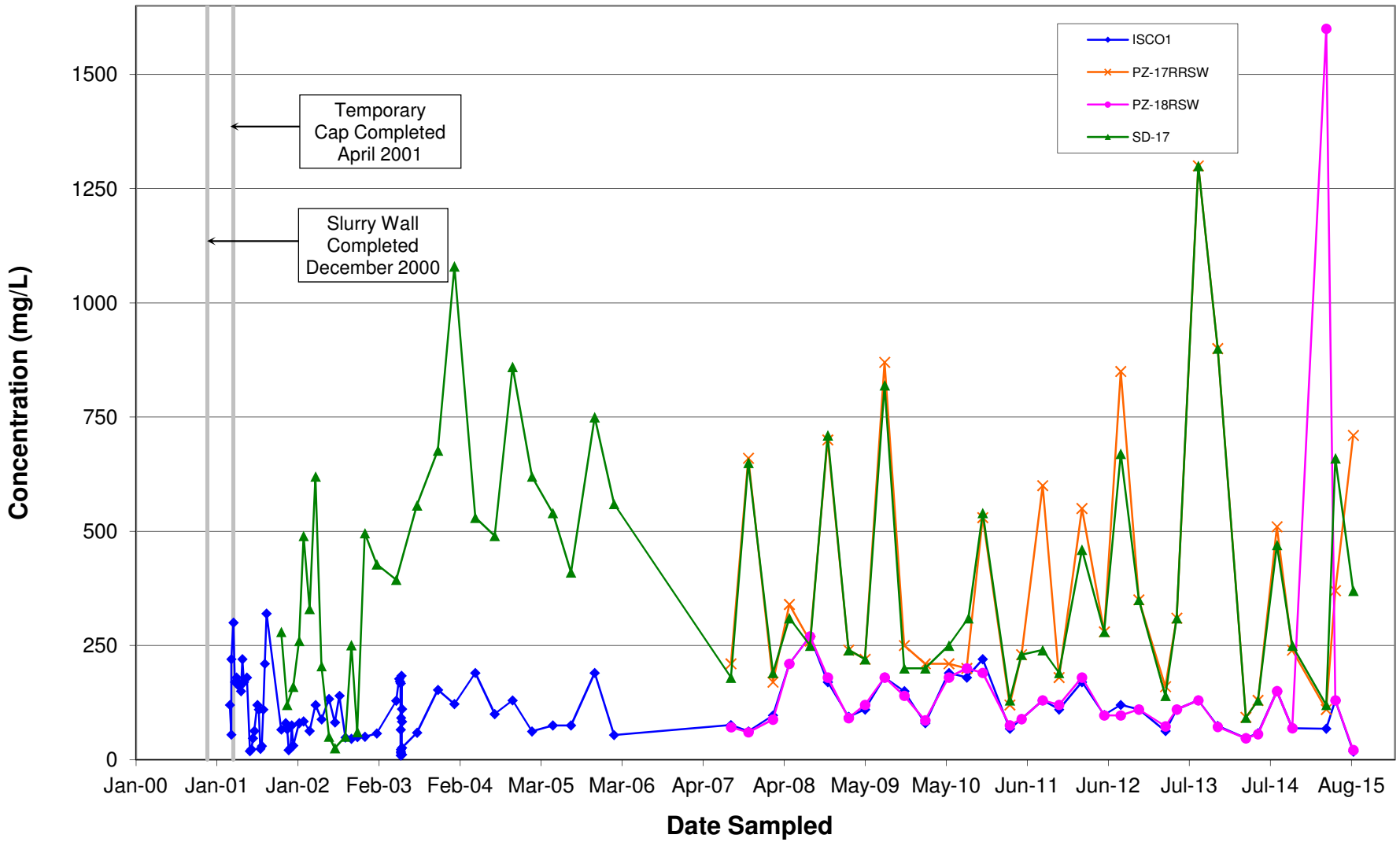
amec foster wheeler

Chloride in Surface Water
in the Lower South Ditch

Figure D-2.8

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride SW LowerSD

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

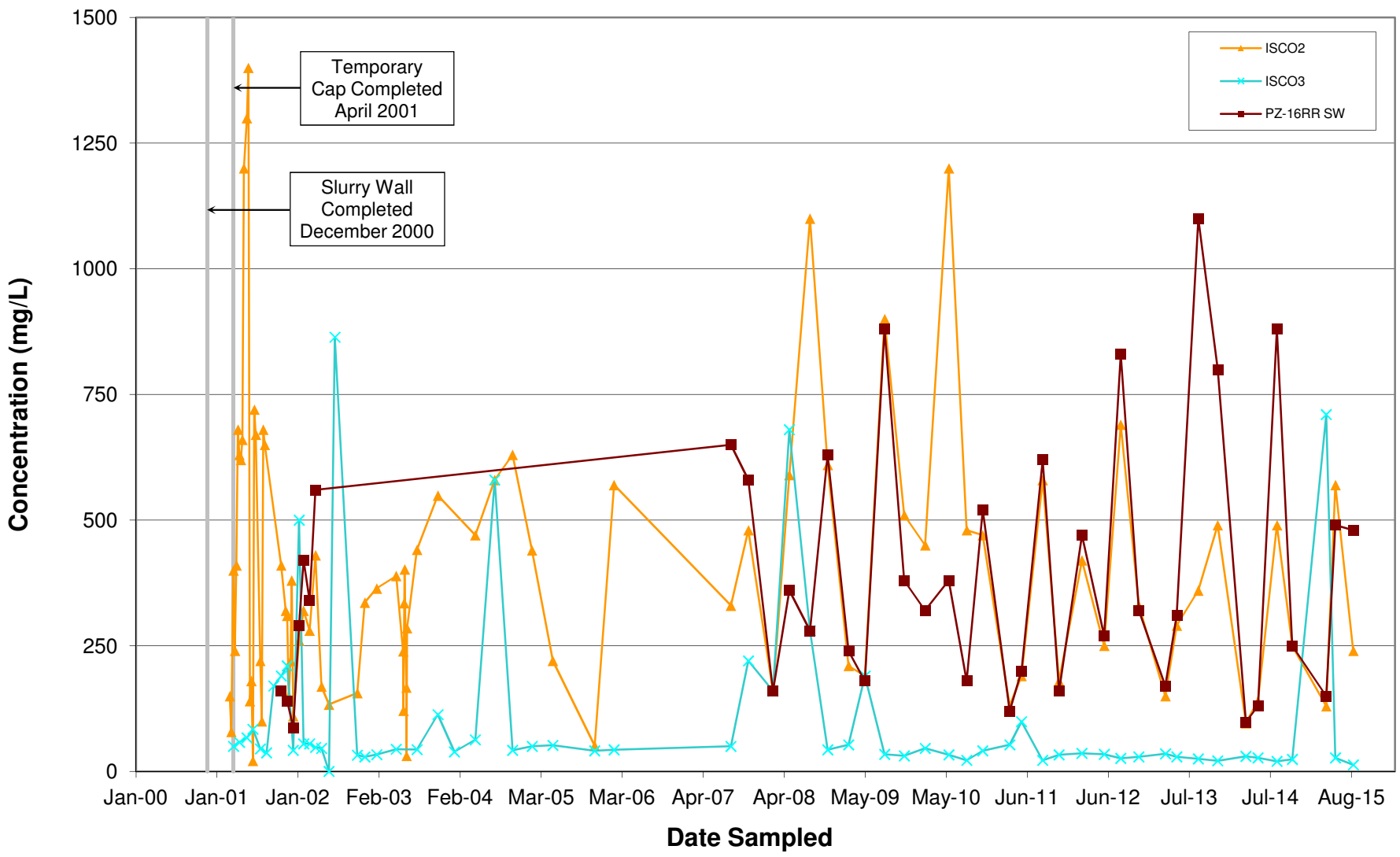
amec foster wheeler

Sulfate in Surface Water
in the Upper South Ditch

Figure D-2.9

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate SW UpperSD

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

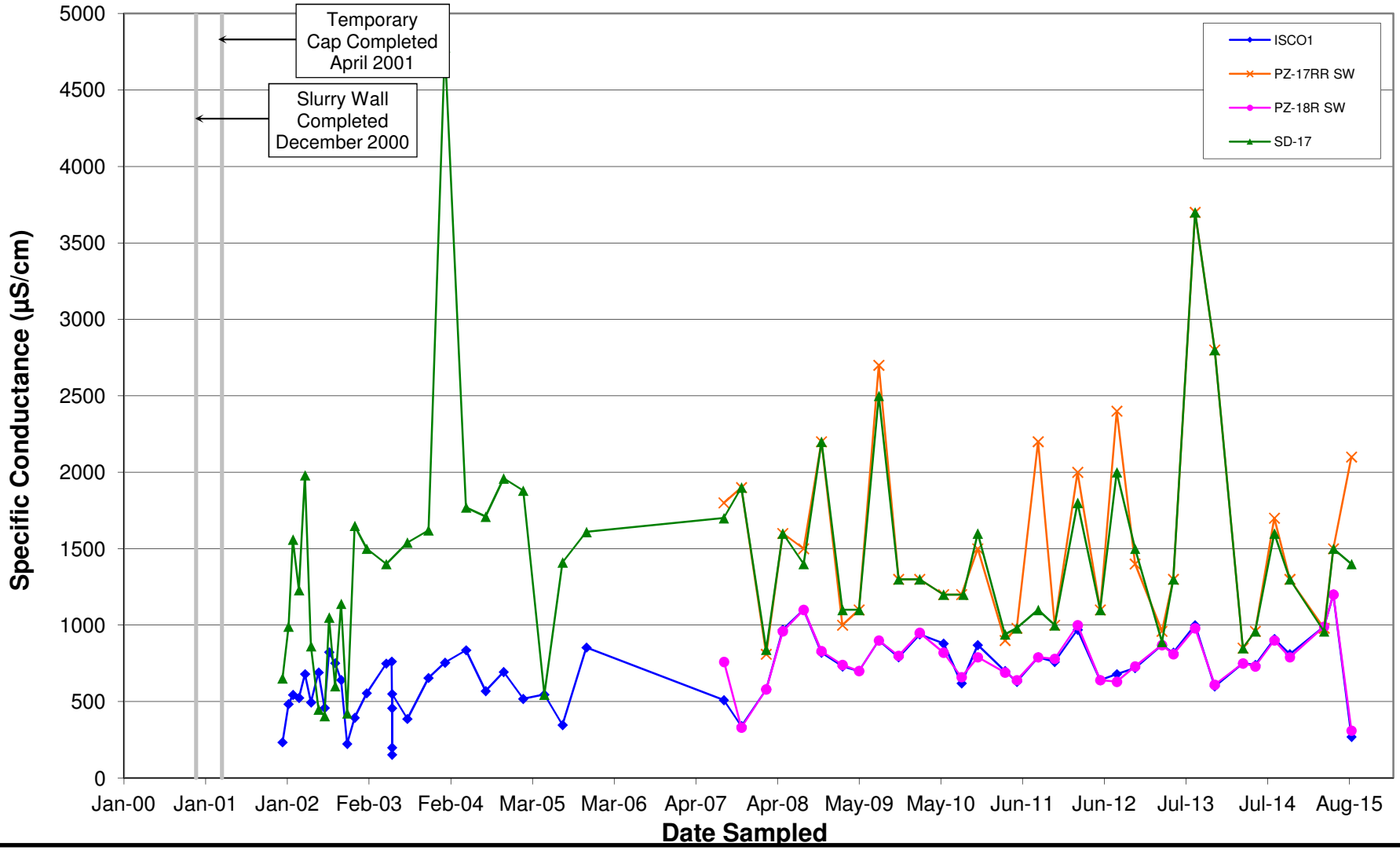
amec foster wheeler

Sulfate in Surface Water
in the Lower South Ditch

Figure D-2.10

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate SW LowerSD

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

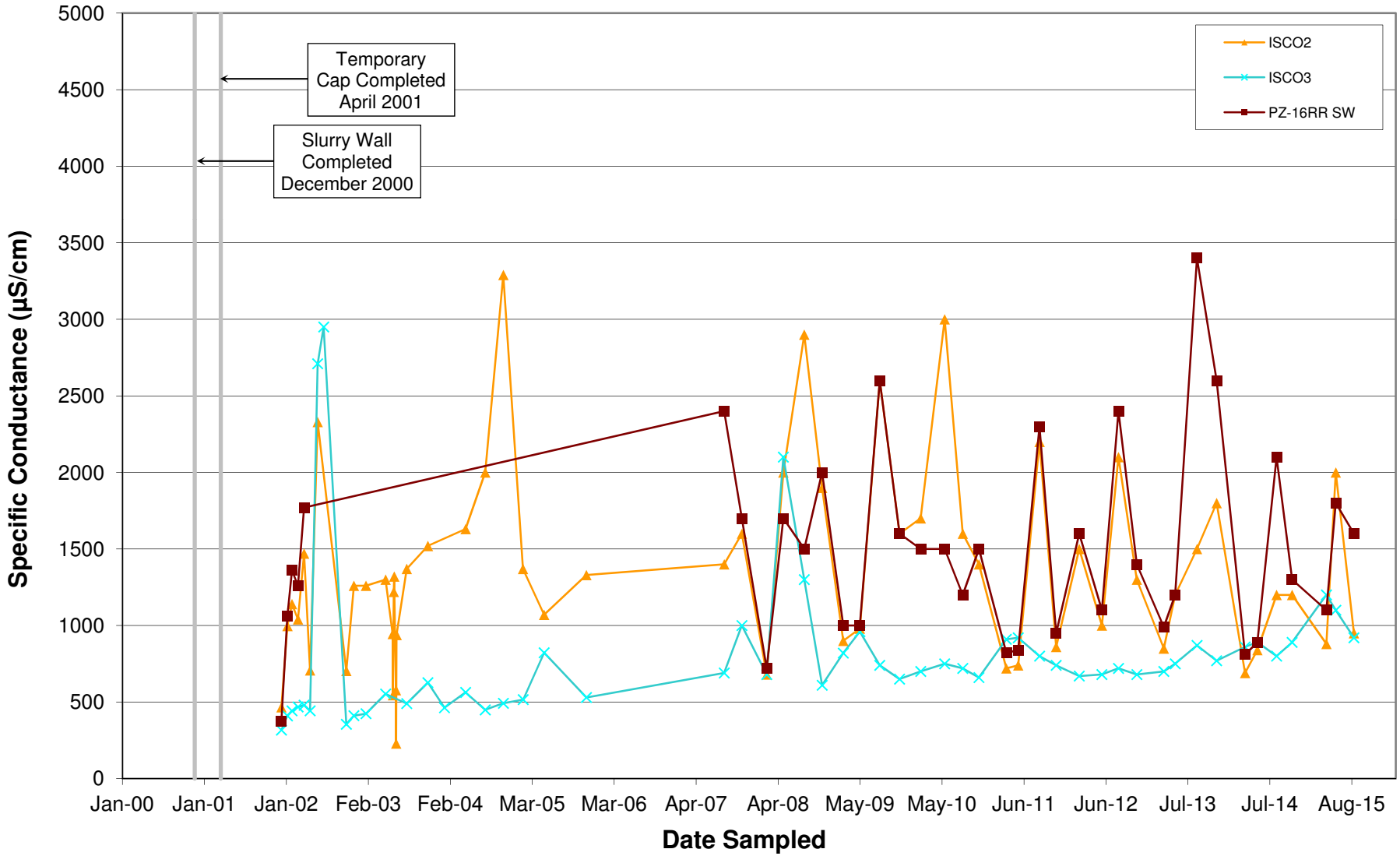
amec foster wheeler

Specific Conductance in Surface Water in the Upper South Ditch

Figure D-2.11

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Specific Conductance SW UpperSD

Prepared by: LCG 06/24/2015
Checked by: CTM 06/24/2015



Semi-Annual Status Report No. 17
Olin Chemical Superfund Site
Wilmington, Massachusetts

amec foster wheeler

Specific Conductance in Surface Water in the Lower South Ditch

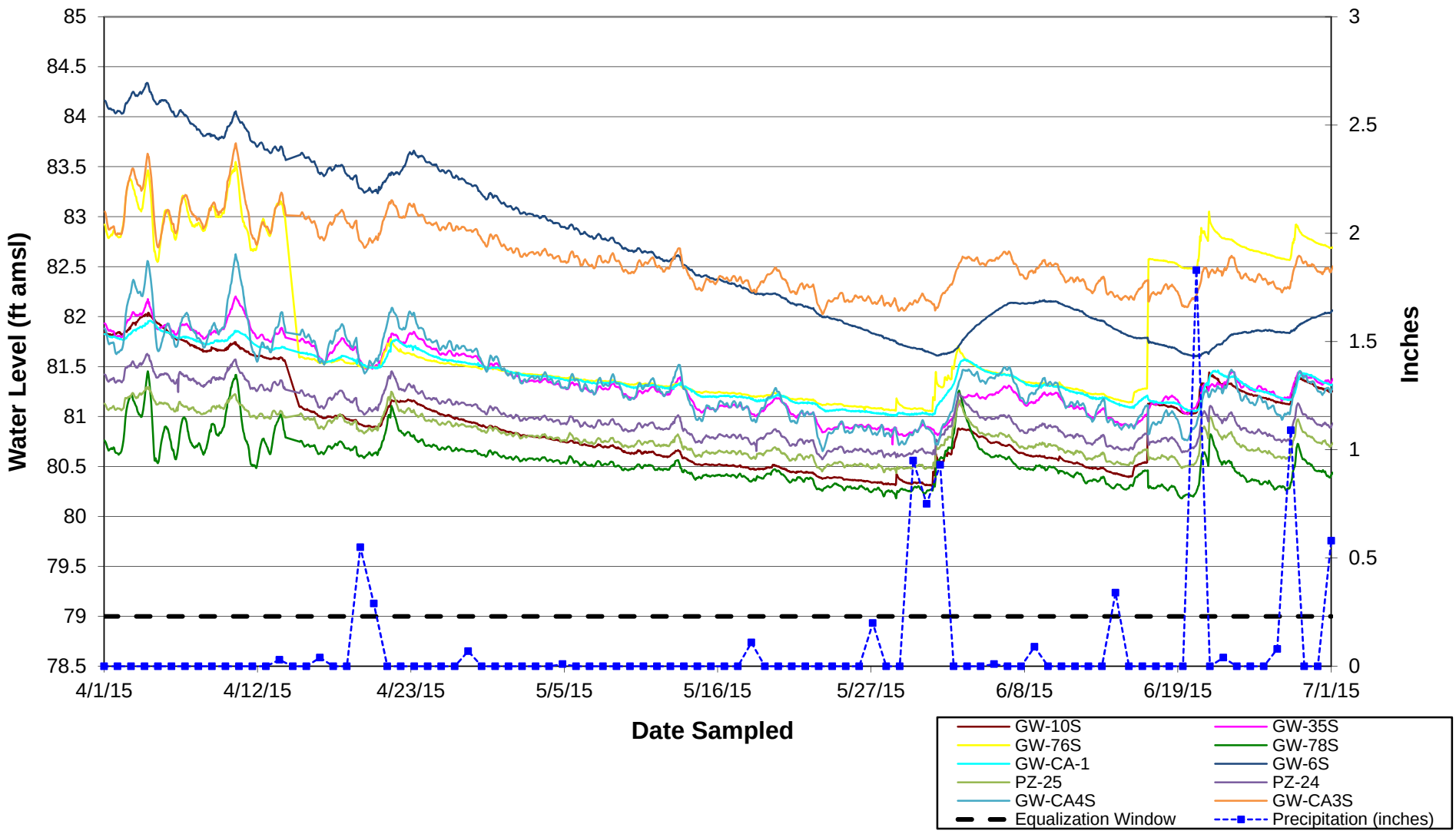
Figure D-2.12

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Specific Conductance SW LowerSD

Prepared by: LCG 11/05/2015
Checked by: CTM 12/17/2015

APPENDIX E

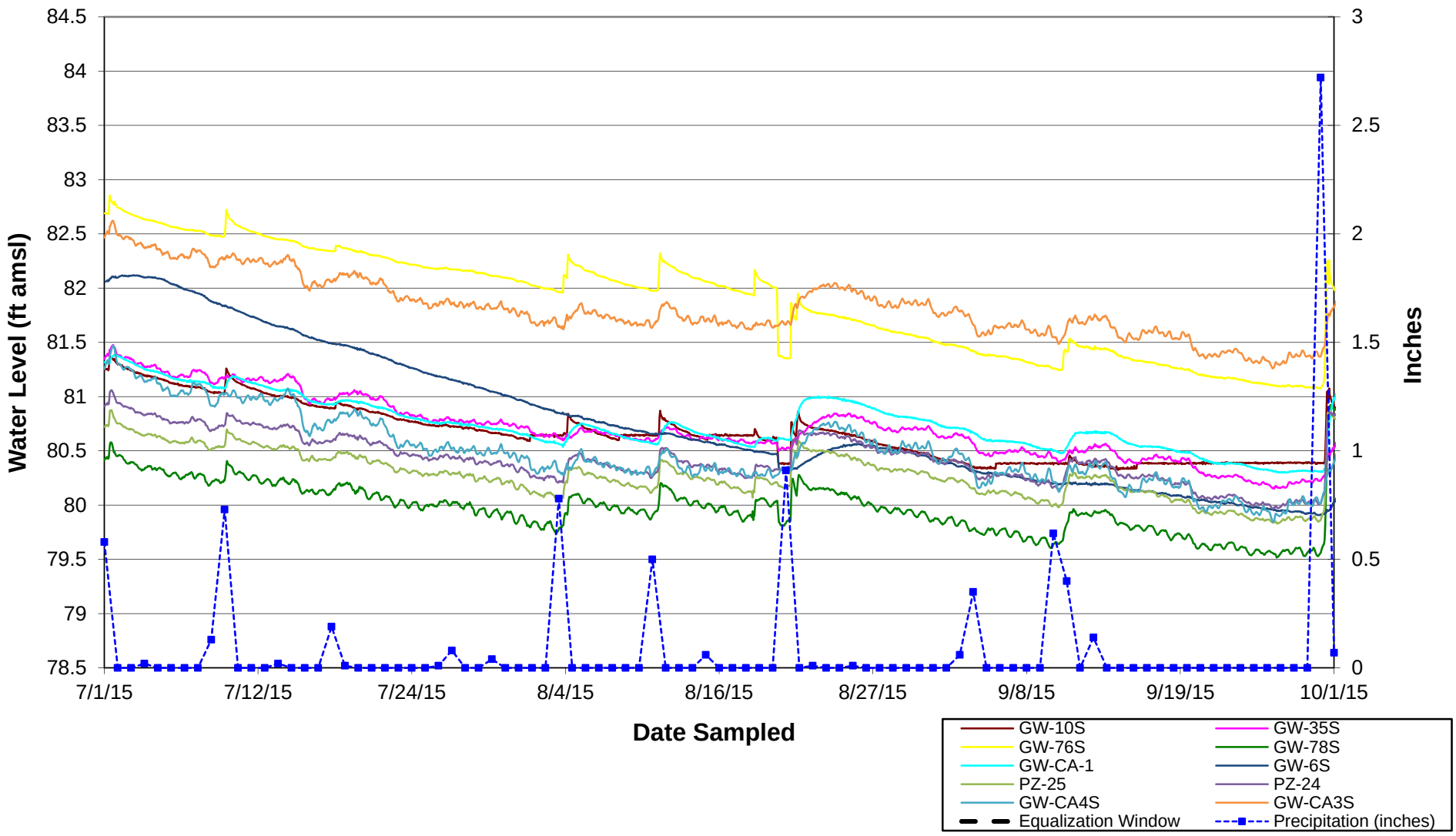
Slurry Wall/Cap Data Logger Water Level Plots



Semi-Annual Status Report No. 17 Olin Wilmington Superfund Site Wilmington, Massachusetts	amec foster wheeler	Groundwater Elevation (Corrected for Barometric Pressure) and Precipitation - Second Quarter 2015 Figure E-1

P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2016 January\Appendix E - Water Level Plots\
Data Logger Corrections.xls2nd Quarter Fig

Prepared by: BJR 12/11/2015
Checked by: CTM 12/22/2015



Semi-Annual Status Report No. 17 Olin Wilmington Superfund Site Wilmington, Massachusetts	amec foster wheeler	Groundwater Elevation (Corrected for Barometric Pressure) and Precipitation - Third Quarter 2015 Figure E-2

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Data Logger Corrections.xls3rd Quarter Fig

Prepared by: BJR 12/1/2015
Checked by: CTM 12/22/2015