

Prepared for:

DREXEL CHEMICAL COMPANY

120 Cape Road
Cordele, GA 31015

**SEVENTH SEMIANNUAL VRP
PROGRESS REPORT
DREXEL CHEMICAL COMPANY
Cordele, Georgia**

Prepared by:



1050 Crown Pointe Parkway, Suite 550
Atlanta, Georgia 30338
Tel: 404-315-9113

October, 2014

DCN: DREXVRPS007

**SEVENTH SEMIANNUAL VRP PROGRESS REPORT
DREXEL CHEMICAL COMPANY
Cordele, Georgia**

Prepared For:

DREXEL CHEMICAL COMPANY

120 Cape Road
Cordele, GA 31015

Prepared By:



1050 Crown Pointe Parkway
Suite 550
Atlanta, GA 30338

A handwritten signature in blue ink that reads "Kirk Kessler".

Kirk Kessler, P.G.
Principal

A handwritten signature in blue ink that reads "T Bullman".

Timmerly Bullman, P.E.
Associate

October 2014



**SEVENTH SEMIANNUAL VRP PROGRESS REPORT
DREXEL CHEMICAL COMPANY
Cordele, Georgia**

TABLE OF CONTENTS

PROFESSIONAL GEOLOGIST CERTIFICATION	1
<hr/>	
1 INTRODUCTION	2
<hr/>	
2 VRP PROJECT MANAGEMENT	3
<hr/>	
2.1 Professional Geologist Oversight.....	3
2.2 Milestone Schedule	3
2.3 Conceptual Site Model.....	3
<hr/>	
3 GROUNDWATER	4
<hr/>	
3.1 Groundwater Delineation	4
3.2 Revised Table.....	4
3.3 Sampling Methods	4
3.4 Groundwater Remediation and Sampling	5
<hr/>	
4 SOIL REMEDIATION	6
<hr/>	
4.1 Delineation.....	6
4.2 First Phase Soil Remediation: Former Surface Impoundments	6
4.3 Second Phase Soil Remediation: Rail Line Remediation.....	6
4.3.1 Actions Complete	6
4.3.2 South Swale	7
4.3.3 Next Step	7

LIST OF TABLES

- Table 1 Groundwater Analytical Results: Organic Constituents above the Detection Limit
- Table 2 Results of Pre-Phase 2 Remediation Confirmation Sampling
- Table 3 Comparison of Post-Remediation Values to Cleanup Criteria – South Swale Exposure Domain

LIST OF FIGURES

- Figure 1 VRP Properties
- Figure 2 Projected Milestone Schedule
- Figure 3 Water FLUTe Pump System
- Figure 4 FLUTe Pumping Procedure
- Figure 5 Exposure Domains
- Figure 6 Phase 2 – Pre-Remediation Confirmation Sampling Locations

LIST OF APPENDICES

- Appendix A Professional Geologist Summary of Hours
- Appendix B Conceptual Site Model
- Appendix C Heritage Invoice
- Appendix D Memorandum re: Advanced Confirmation Sampling for Phase 2 Remediation
- Appendix E Confirmation Sampling Laboratory Data Report

PROFESSIONAL GEOLOGIST CERTIFICATION

“I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12-8-101, et seq.). I am a professional engineer/professional geologist who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors/Georgia State Board of Registration for Professional Geologists and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances.

Furthermore, to document my direct oversight of the Voluntary Remediation Plan development, implementation of corrective action, and long term monitoring, I have attached a monthly summary of hours invoiced and description of services provided by me to the Voluntary Remediation Program participant since the previous submittal to the Georgia Environmental Protection Division.

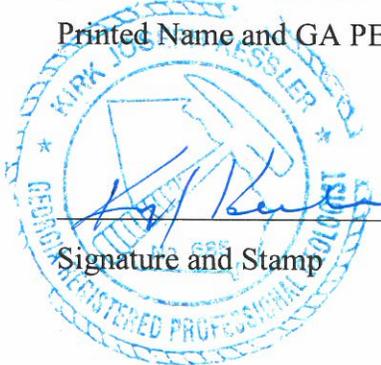
The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Kirk Kessler GA000685

Printed Name and GA PE/PG Number

10/16/2014

Date



1 INTRODUCTION

Drexel Chemical Company (Drexel) submitted a Voluntary Remediation Program (VRP) Application (which the EPD refers to as the Voluntary Investigation and Remediation Plan, (VIRP) in February 2011. In a letter dated April 28, 2011, the Georgia Environmental Protection Division (EPD) accepted Drexel as a participant into the VRP. Pursuant to the conditions of the acceptance letter, this document is the Seventh Semiannual Progress Report (Progress Report) for the Drexel Site.

The Drexel facility is located at 120 Cape Road, Cordele, Crisp County, Georgia (Facility). The Facility is a Pesticide Blending Facility, which is located approximately four miles east of downtown Cordele in a primarily agricultural and wooded area. The Drexel Facility (as originally accepted into the VRP) is approximately 6.89 acres, which consists of two parcels owned by Drexel. With the Second Progress Report (submitted in April, 2012), Drexel requested that other property bordering the facility and owned by Drexel be added to the VRP. Additionally, on August 29, 2012 Drexel and CSX Transportation (CSX) submitted a request to include the CSX property bordering the facility to the north, to be added as an eligible property in the VRP. In a letter dated December 5, 2012, the EPD accepted the CSX and additional Drexel parcels into the VRP. For discussion purposes, these properties will be referred to as “Drexel Facility,” “CSX,” and “Drexel Additional Property” and are jointly referred to as the “Site.” Figure 1 shows the locations of these properties.

This Progress Report summarizes (by task) what actions have been taken since the previous Progress Report (April 2014) and presents the expected schedule for upcoming activities. This Progress Report also responds to several items mentioned in a letter sent by the EPD on June 19, 2014. The July 19 letter summarized the EPD’s review of the Ecological Remediation Plan, Fourth Progress Report, Fifth Progress Report, and Sixth Progress Report.

2 VRP PROJECT MANAGEMENT

2.1 Professional Geologist Oversight

This Progress Report includes certification by the Professional Geologist (Kirk Kessler) specified in the VIRP. Appendix A contains a monthly summary of hours invoiced and description of services provided.

2.2 Milestone Schedule

An updated projected milestone schedule has been attached as Figure 2.

2.3 Conceptual Site Model

The Conceptual Site Model (CSM) has been revised to include the results of recent confirmation sampling and is included as Appendix B.

3 GROUNDWATER

3.1 Groundwater Delineation

In the letter dated June 19, 2014, the EPD concurred that vertical delineation of groundwater is complete. EPD also stated that horizontal delineation of groundwater is incomplete due to the 1,2-dibromoethane (EDB) concentration in BW-5. However, the EPD is not requiring the installation of an additional delineation well at this time. Instead, Drexel is to continue monitoring groundwater at BW-5 per the remediation plan (presented in the Fifth Progress Report) until the concentration of EDB is at or below the delineation criterion.

3.2 Revised Table

Table 2 from the Sixth Progress Report has been updated based on EPD's request in the June 19, 2014 letter to correct the Risk Reduction Standards (RRSs) for two constituents (dibromo-3-chloropropane and o-xylene). This revised table is attached as Table 1.

3.3 Sampling Methods

EPD requested additional information concerning the groundwater purging and sampling methods that are used. All of the conventional wells (i.e., BW-1, BW-2, BW-3, BW-4, BW-5, and Well D) are purged and sampled using low flow/low stress methods. A submersible pump is used in conjunction with Teflon-lined polyethylene tubing. Geochemical parameters are monitored during purging and recorded on Monitoring Well Sampling Forms that have been included with each progress report. After the water quality parameters have stabilized and a minimum of three well volumes have been purged, samples are collected directly from the polyethylene tubing attached to the submersible pump.

The FLUTE well (MW-6) is purged and sampled using the methodology recommended by FLUTE. Each port being sampled is individually purged and then sampled. The groundwater is obtained by air lifting the water using pressurized nitrogen. Figure 3 and 4 attached show a depiction of the pumping procedure from the manufacturer. Water is pumped from the tubing by applying the gas pressure to the interface at the static water level in the pump tube. The water is driven down in the pump tube and up through the second check valve to the surface via the sample tube. The tubing is allowed to refill and then the lines are purged a second time. The lines are allowed to refill again, the gas pressure is reduced, and the water is air lifted for sampling. Groundwater samples are collected directly from the sample tube.

3.4 Groundwater Remediation and Sampling

EPD approved of the groundwater remedial plan and the associated groundwater monitoring plan that were presented in the Fifth Progress Report. Accordingly groundwater monitoring will resume per the plan after the groundwater pump-and-treat system is operational, which will be following implementation of the soil remedial plan. Discharge from the groundwater pump-and-treat system will be done in accordance with all applicable local, state and federal laws and regulations.

4 SOIL REMEDIATION

4.1 Delineation

In the June 19th, 2014 letter, the EPD concurred that the soil has been horizontally and vertically delineated.

4.2 First Phase Soil Remediation: Former Surface Impoundments

Drexel conducted remediation of former surface impoundments (SI) at the Site beginning in late November 2013. The Sixth Progress Report contained details concerning this remediation and provided documentation that this portion of the Site (the “Drexel West” exposure domain) is now in compliance with residential RRS. Figure 5 shows the different exposure domains. EPD (in the June 19, 2014 letter) concurs that the SI excavation is complete and that the Drexel West Exposure Domain is in compliance with residential RRS for soil.

Some of the soil excavated during this remediation had not been disposed of at the time of the Sixth Progress Report. Samples of the stockpiled soil from SI-5 failed for TCLP chlordane. Exotech conducted a treatability test on the soil to determine the feasibility of treating the soil such that it could be disposed of as non-hazardous. Five different chemical combinations (persulfate with iron activator, persulfate with sodium hydroxide activator, zero valent iron, calcium polysulfide, dithianite and zero valent iron with surfactant) were evaluated. Nearly all approaches resulted in a decrease in chlordane concentrations, with sodium persulfate and calcium polysulfide providing the greatest decreases (77-84% reduction). However, TCLP test results at the conclusion of the treatability test still failed for chlordane. Accordingly, the material (895.44 tons) was transported to Heritage Environmental Services for incineration. A copy of the invoice from Heritage is included as Appendix C.

4.3 Second Phase Soil Remediation: Rail Line Remediation

4.3.1 Actions Complete

EPD approved of the remedial plan for the remainder of the Site, but requested that confirmation samples be collected. A memorandum was submitted by EPS to the EPD on July 2, 2014 with the proposed sampling plan and how the data would be evaluated. A copy of this memorandum is included as Appendix D. EPD approved this plan in an e-mail dated July 2, 2014.

Sampling was conducted on July 23, 2014 in accordance with the plan. A Geoprobe rig was used to advance the two boring locations to a depth of 10 feet (ft). Figure 6 shows the locations of the two samples (B-110 and B-111). Samples from each location were collected at 1ft below ground surface (bgs) and 10ft bgs. All samples were analyzed for pesticides (SW8081B) and

RCRA metals (SW6010C and SW7471B). Samples were placed in laboratory-supplied containers, packed on ice and delivered to the laboratory for analysis.

The analytical results are summarized on Table 2 and the laboratory report is included as Appendix E. Table 2 shows a comparison of the analytical results for constituents detected above the residential soil RRS, to the maximum concentrations proposed to be left on-Site after the Phase 2 remediation (from Table 6B of the Fifth Progress Report). All of the results were below either the residential RRS or these maximum concentrations being left on-Site; therefore, no additional re-interpolation was required and the remediation plan presented in the Fifth Progress Report remains unchanged.

4.3.2 South Swale

In the June 16th, 2014 letter, the EPD requested that the demonstration of compliance of soil in the South Swale Exposure Domain include a comparison to the Ecological Remedial Goals (ERG). Accordingly, Table 6B from the Fifth Progress Report has been updated and is included as Table 3. This table shows the post-remediation concentrations in the South Swale domain compared to both the RRSs and the ERGs. The maximum concentrations to be left on-Site are below the ERGs.

4.3.3 Next Step

Conducting remediation work along a CSX rail line requires close coordination with CSX, including approval by CSX of both an excavation plan and a shoring plan. An excavation plan (based on the EPD-approved remediation plan) has been submitted to CSX for approval. Drexel has selected a shoring contractor who is working on the shoring design, which will be submitted to CSX for approval.

Once the designs have been approved, Drexel will request bids from multiple remediation contractors to conduct the rail line and drainage swale remediation work. The remediation is anticipated to begin in May-June 2015 to allow for the various approvals from CSX and to accommodate Drexel's production schedule.

TABLES

Table 1. Groundwater Analytical Results: Organic Constituents above the Detection Limit

Location	Date Sampled	Herbicide	Pesticides					SVOCs		VOCs									
		Dinoseb (DNBP) (µg/L)	Endrin (µg/L)	gamma-BHC (Lindane) (µg/L)	Heptachlor (µg/L)	Heptachlor epoxide (µg/L)	Methoxy-chlor (µg/L)	1,4-Dichloro-benzene (µg/L)	bis(2-Ethylhexyl) phthalate (µg/L)	1,2-Dibromo-3-chloropropane (µg/L)	1,2-Dibromoethane (µg/L)	1,2-Dichloroethane (µg/L)	1,2-Dichloropropane (µg/L)	Benzene (µg/L)	Carbon tetrachloride (µg/L)	Dimethoate (µg/L)	Ethyl benzene (µg/L)	o-Xylene (µg/L)	Toluene (µg/L)
Type 1 RRS		7	2	0.2	0.4	0.2	40	75	6	0.2	0.05	5*	5	5	5	7	700	DL	1000
Residential RRS		20	5	0.8	0.4	0.2	80	75	60	0.2	0.09	5*	5	5	6	7	700	370	1000
D	3/6/2013	<0.048	<0.00077	<0.00041	<0.00049	0.015	<0.011i	<0.12	0.21J	<0.0036	<0.003	<0.08	<0.095	<0.062	<0.096	<0.0047	0.05J	<0.074	0.32J
D	9/10/2013	<0.048	<0.00077	<0.00041	<0.00049	<0.00049	<0.0013	<0.12	0.25J	<0.0036	<0.003	<0.08	<0.095	0.51	<0.096	<0.0047	0.16J	0.13J	0.6
D	2/18/2014	<0.048	<0.00077	<0.00041	<0.00049	<0.0006	<0.0013	<0.12	0.16J	<0.0036	<0.003	<0.08	<0.095	<0.062	<0.096	<0.0047	0.14J	0.35J	<0.054
PW-1	10/5/2000	<0.5	<0.1	<0.05	<0.05	<0.05	<0.5	<10	<10	NA	<5	<5	<5	<5	<5	NA	<5	NA	<5
PW-1	11/22/2000	<0.5	<0.1	<0.05	<0.05	<0.05	<0.5	<10	<10	NA	NA	<5	<5	<5	<5	<2	<5	NA	<5
PW-1	7/22/2003	<0.88	<1	<0.1	<0.1	<0.1	<2	<0.5	<4	<0.5	0.131	<0.5	<0.5	<0.5	<0.5	NA	<0.5	NA	<0.5
PW-1	7/31/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.13	NA	NA	NA	NA	NA	NA	NA	NA
PW-1	8/7/2003	NA	NA	NA	NA	NA	NA	NA	NA	<0.012	0.213	NA	NA	NA	NA	NA	NA	NA	NA
PW-1 (150 ft)	5/5/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0082J	NA	NA	NA	NA	NA	NA	NA	NA
PW-1 (190 ft)	5/5/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0021	NA	NA	NA	NA	NA	NA	NA	NA
PW-1	11/16/2005	1.1J	<0.097	<0.13	<0.1	<0.11	<0.059	<0.23	<1.1	<0.0025	0.29	<0.24	<0.24	<0.21	0.29J	NA	<0.23	NA	<0.22
PW-1	6/30/2010	1.6	<0.0098i	0.0037JP	<0.00049	<0.045i	<0.069i	<0.05	0.16J	<0.0036	0.11	0.26J	0.12J	<0.022	0.21J	<0.0047	<0.023	<0.023	<0.05
PW-1	8/10/2011	3.7	<0.00077	0.0071J	<0.00049	<0.012i	0.037P	<0.05	0.14J	0.023	1.4D	0.53	0.35J	<0.022	0.46J	<0.0047	<0.023	<0.023	<0.05
PW-1	2/15/2012	0.63	<0.0098i	0.0042J	<0.00049	<0.0006	<0.0013	<0.05	0.15J	0.0047J	0.14	0.41J	0.14J	<0.022	0.2J	<0.0047	<0.023	<0.023	<0.05
PW-2	10/5/2000	<0.5	<0.1	<0.05	<0.05	<0.05	<0.5	<10	<10	NA	<5	<5	<5	<5	<5	NA	<5	NA	<5
PW-2	7/31/2003	<0.1	<0.001	<0.01	<0.005	<0.005	<0.01	<0.2	<0.1	<0.02	0.074	<0.2	<0.2	<0.2	<0.2	NA	<0.2	NA	<0.2
PW-2	8/7/2003	NA	NA	NA	NA	NA	NA	NA	NA	<0.012	0.053	NA	NA	NA	NA	NA	NA	NA	NA
PW-2 (190 ft)	5/5/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0021	NA	NA	NA	NA	NA	NA	NA	NA
PW-2 (235 ft)	5/5/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0021	NA	NA	NA	NA	NA	NA	NA	NA
PW-2	11/16/2005	<0.39	<0.096	<0.13	0.036	<0.11	<0.058	<0.23	7.5	0.05	0.02	<0.24	<0.24	<0.21	<0.24	NA	<0.23	NA	35
PW-2	6/30/2010	<0.048	<0.0062i	0.0037J	<0.00049	<0.0086i	<0.0013	<0.05	0.11J	0.046	0.012	<0.038	<0.057	<0.022	<0.039	<0.0047	<0.023	<0.023	<0.05
PW-AIKEN	8/11/2003	<0.88	<1	<0.1	<0.1	<0.1	<2	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	<0.5	NA	<0.5
PW-AIKEN	5/3/2005	<0.38	<0.087	<0.12	<0.09	<0.099	<0.052	<0.23	<0.99	<0.0025	<0.0021	<0.24	<0.24	<0.21	<0.24	<0.2	<0.23	NA	<0.22
PW-AIKEN	4/27/2006	<0.4	<0.09	<0.12	<0.093	<0.1	<0.054	<0.23	<1	<0.0022	<0.0018	<0.24	<0.24	<0.21	<0.24	<0.13	<0.23	NA	<0.22
PW-AIKEN	7/1/2010	<0.048	<0.00077	<0.00041	<0.00049	<0.0006	<0.0013	<0.05	0.43J	<0.0036	<0.003	<0.038	<0.057	<0.022	<0.039	<0.0047	<0.023	<0.023	<0.05
PW-AIKEN	8/10/2011	<0.048	<0.00077	<0.00041	<0.00049	0.0028J	<0.0013	<0.05	0.15J	<0.0036	<0.003	<0.038	<0.057	0.04J	<0.039	<0.0047	<0.023	<0.023	<0.05
PW-Farrow1	5/3/2005	<0.38	<0.088	<0.12	<0.091	<0.1	<0.053	<0.23	<1	<0.0025	<0.0021	<0.24	<0.24	<0.21	<0.24	<0.2	<0.23	NA	<0.22
PW-Farrow1	4/27/2006	<0.4	<0.089	<0.12	<0.092	<0.1	<0.054	<0.23	<1	<0.0022	<0.0018	<0.24	<0.24	<0.21	<0.24	<0.13	<0.23	NA	<0.22
PW-Farrow1	6/30/2010	<0.048	<0.00077	<0.00041	<0.00049	<0.0006	<0.0013	<0.05	<0.06	<0.0036	<0.003	<0.038	<0.057	<0.022	<0.039	<0.0047	<0.023	<0.023	<0.05
PW-Farrow2 (Dup)	5/3/2005	<0.38	<0.089	<0.12	<0.092	<0.1	<0.054	<0.23	<1	<0.0025	<0.0021	<0.24	<0.24	<0.21	<0.24	<0.2	<0.23	NA	<0.22
PW-Farrow2	5/3/2005	<0.38	<0.088	<0.12	<0.091	<0.1	<0.053	<0.23	<1	<0.0025	<0.0021	<0.24	<0.24	<0.21	<0.24	<0.2	<0.23	NA	<0.22
PW-Farrow2	4/26/2006	<0.38	<0.097	<0.13	0.1 *	<0.11	<0.058	<0.23	<1.1	<0.0022	<0.0018	<0.24	<0.24	<0.21	<0.24	<0.13	<0.23	NA	<0.22
PW-Farrow2	6/30/2010	<0.048	<0.00077	<0.00041	<0.00049	<0.0006	<0.0013	<0.05	<0.06	<0.0036	<0.003	<0.038	<0.057	<0.022	<0.039	<0.0047	<0.023	<0.023	<0.05
PW-SANDERS	8/11/2003	<0.88	<1	<0.1	<0.1	<0.1	<2	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	<0.5	NA	<0.5
PW-SANDERS	5/4/2005	<0.38	<0.087	<0.12	<0.09	<0.099	<0.052	<0.23	<0.99	<0.0025	<0.0021	<0.24	<0.24	<0.21	<0.24	<0.2	<0.23	NA	<0.22
PW-Scoggins	5/3/2005	<0.4	<0.087	<0.12	<0.09	<0.099	<0.052	<0.23	<0.99	<0.0025	<0.0021	<0.24	<0.24	<0.21	<0.24	<0.2	<0.23	NA	<0.22
PW-Scoggins	4/27/2006	<0.4	<0.09	<0.12	<0.093	<0.1	<0.054	<0.23	<1	<0.0022	<0.0018	<0.24	<0.24	<0.21	<0.24	<0.13	<0.23	NA	<0.22
PW-Scoggins	6/30/2010	<0.048	<0.00082	<0.00044	<0.00052	<0.00064	<0.0014	<0.05	0.098J	<0.0036	<0.003	<0.038	<0.057	<0.022	<0.039	<0.0047	<0.023	<0.023	<0.05
PW-STEWART	8/11/2003	<0.88	<1	<0.1	<0.1	<0.1	<2	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	<0.5	NA	<0.5
PW-STEWART	5/4/2005	<0.38	<0.087	<0.12	<0.09	<0.099	<0.052	<0.23	<0.99	<0.0025	<0.0021	<0.24	<0.24	<0.21	<0.24	<0.2	<0.23	NA	<0.22

Dup - duplicate sample

* RRS not calculated, HSRA Type 1 Groundwater criteria value shown.

NA - not analyzed

NA** - not analyzed due to laboratory error

Bold: Above Residential RRS

Qualifiers:

J The associated numerical value is an estimated quantity.

B Analyte present in the blank and the sample.

* Spike recovery is equal to or outside the control criteria used.

P > 40% difference for detected concentrations between two columns - changed from 25% per DOE SOW Rev. 4 (6/30/04)

D Analytes analyzed at a secondary dilution.

E Reported value is estimated because of the presence of interference.

Table 2. Results of Pre-Phase 2 Remediation Confirmation Sampling (7/23/14)

Parameter		B-110 1ft	B-110 10ft	B-110 10ft (Dup)	B-111 1ft	B-111 10ft	Residential Soil RRS	Max Left On Site in Drexel East Domain
Detected								
Arsenic	(mg/kg)	<2.9	<5.4	4.69	<5.67	<5.84	20	
Barium	(mg/kg)	3.97	<5.4	<4.09	47.9	7.81	2554	
Chromium	(mg/kg)	13.4	16.4	35.6	17	15.9	100	
Lead	(mg/kg)	<2.9	<5.4	7.59	16.2	<5.84	270	
Chlordane	(mg/kg)	<0.038	<0.041	0.99	<3.8	<0.83	9.2	
Toxaphene	(mg/kg)	<0.19	<0.21	<1.9	35	4.9	10.88	420
Not Detected								
Cadmium	(mg/kg)	<1.45	<2.7	<2.04	<2.83	<2.92		
Mercury	(mg/kg)	<0.112	<0.123	<0.115	<0.113	<0.123		
Selenium	(mg/kg)	<2.9	<5.4	<4.09	<5.67	<5.84		
Silver	(mg/kg)	<1.45	<2.7	<2.04	<2.83	<2.92		
4,4'-DDD	(mg/kg)	<0.0038	<0.0041	<0.039	<0.38	<0.083		
4,4'-DDE	(mg/kg)	<0.0038	<0.0041	<0.039	<0.38	<0.083		
4,4'-DDT	(mg/kg)	<0.0038	<0.0041	<0.039	<0.38	<0.083		
Aldrin	(mg/kg)	<0.0019	<0.0021	<0.019	<0.19	<0.042		
alpha-BHC	(mg/kg)	<0.0019	<0.0021	<0.019	<0.19	<0.042		
alpha-Chlordane	(mg/kg)	<0.0019	<0.0021	<0.019	<0.19	<0.042		
beta-BHC	(mg/kg)	<0.0019	<0.0021	<0.019	<0.19	<0.042		
delta-BHC	(mg/kg)	<0.0019	<0.0021	<0.019	<0.19	<0.042		
Dieldrin	(mg/kg)	<0.0038	<0.0041	<0.039	<0.38	<0.083		
Endosulfan I	(mg/kg)	<0.0019	<0.0021	<0.019	<0.19	<0.042		
Endosulfan II	(mg/kg)	<0.0038	<0.0041	<0.039	<0.38	<0.083		
Endosulfan sulfate	(mg/kg)	<0.0038	<0.0041	<0.039	<0.38	<0.083		
Endrin	(mg/kg)	<0.0038	<0.0041	<0.039	<0.38	<0.083		
Endrin Aldehyde	(mg/kg)	<0.0038	<0.0041	<0.039	<0.38	<0.083		
Endrin ketone	(mg/kg)	<0.0038	<0.0041	<0.039	<0.38	<0.083		
gamma-BHC (Lindane)	(mg/kg)	<0.0019	<0.0021	<0.019	<0.19	<0.042		
gamma-Chlordane	(mg/kg)	<0.0019	<0.0021	<0.019	<0.19	<0.042		
Heptachlor	(mg/kg)	<0.0019	<0.0021	<0.019	<0.19	<0.042		
Heptachlor epoxide	(mg/kg)	<0.0019	<0.0021	<0.019	<0.19	<0.042		
Methoxychlor	(mg/kg)	<0.019	<0.021	<0.19	<1.9	<0.42		

Of the constituents that were detected, only one result was above it's residential RRS.

That result is below the highest concentration being left on-site in the Drexel East after the planned remediation.

Table 3. Comparison of Post-Remediation Values to Cleanup Criteria - South Swale Exposure Domain

Parameter	Human Health Cleanup Criteria			Ecological Cleanup Criteria		Pre-Remediation	Post-Remediation	
	Residential RRS (mg/kg)	Industrial SS RRS (mg/kg)	Industrial SB RRS (mg/kg)	Short-Tailed Shrew LOAEL RG (mg/kg)	American Robin LOAEL RG (mg/kg)	Maximum Detected Conc (mg/kg)	Maximum Detected Conc (mg/kg)	Interpolated 95% UCL (mg/kg)
South Swale 0-2 ft								
4,4'-DDD	19	47	47	97	58	74	5.3	
4,4'-DDE	14	38	38	39	25	19	1.3	
4,4'-DDT	20	54	54	26	17	273	0.22	
Arsenic	20	38	41	51	62	58	15	
Chlordane	9.2	9.2	9.2	33	52	57	10	0.27
Chlorpyrifos	15	94	94	112	105	690	ND	
Copper	915	2886	2886	1423	214	18100	16	
Dimethoate	0.7	0.7	0.7	705	38	8.0	ND	
Endosulfan I	26	170	170	118		47	5.1	
Endosulfan II	10	10	10	118		12	0.77	
Toxaphene	10.88	10.88	10.88	1453	58	587	1.3	

Bold: Exceeds Residential RRS

* Protection of GW RRS / Direct Soil Contact RRS

** Italics: Exceeds Residential RRS for protection of groundwater, but not direct contact

FIGURES



0 250 500 1,000
Feet

Legend

-  Drexel Facility
-  CSX
-  Drexel Additional Property

VRP Properties
Figure No. 1

Figure 2. Projected Milestone Schedule

ID	Task Name	2011			2012				2013				2014				2015				2016	
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1	Project Management																					
	Semi-Annual Progress Reports			Oct 28		Apr 28		Oct 28		Apr 28		Dec 28		Apr 28		Oct 28		Apr 28		Oct 28		CSR Apr 28
	Horizontal delineation on Property					Apr 28																
	Horizontal delineation off-Property									Apr 28												
	Vertical delineation, final remediation plan, cost estimate for remediation											Dec 28										
2	Abandon Production Wells (PW-1, PW-2) and Install New Monitoring Well																					
	Develop Plan																					
	EPD Approval																					
	Perform Work																					
3	Groundwater Sampling																					
4	Additional Characterization																					
	Develop Scope																					
	Perform Work																					
5	Ecological Risk Assessment																					
	Revised SLERA																					
	Ecological Remediation Plan																					
6	Soil Remediation																					
	Surface Impoundments: Develop Plan																					
	Surface Impoundments: Remediation																					
	Develop Rail Car Unloading and Drainage Swale Plan																					
	Bid Shoring Contract																					
	Submit Shoring Plan to CSX for Approval																					
	Submit Excavation Plan to CSX for Approval																					
	Bid Excavation Work																					
	Perform Rail/Swale Soil Remedial Work																					
7	Groundwater Remediation																					
	Install Pump and Treat System																					
	Groundwater Monitoring																					

Complete
Anticipated

Figure 3. Water FLUTE pump system

(Single port system shown for clarity)

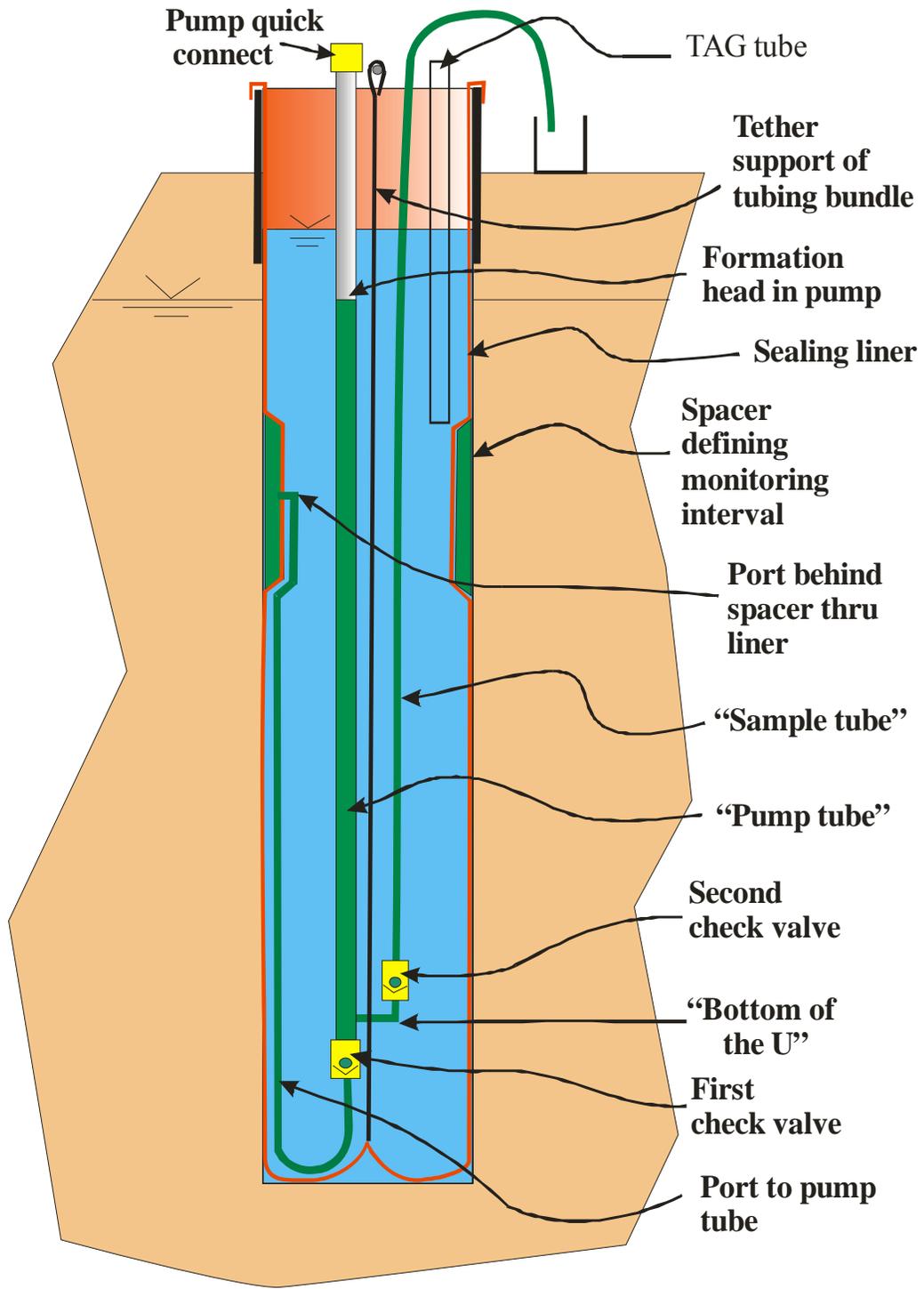
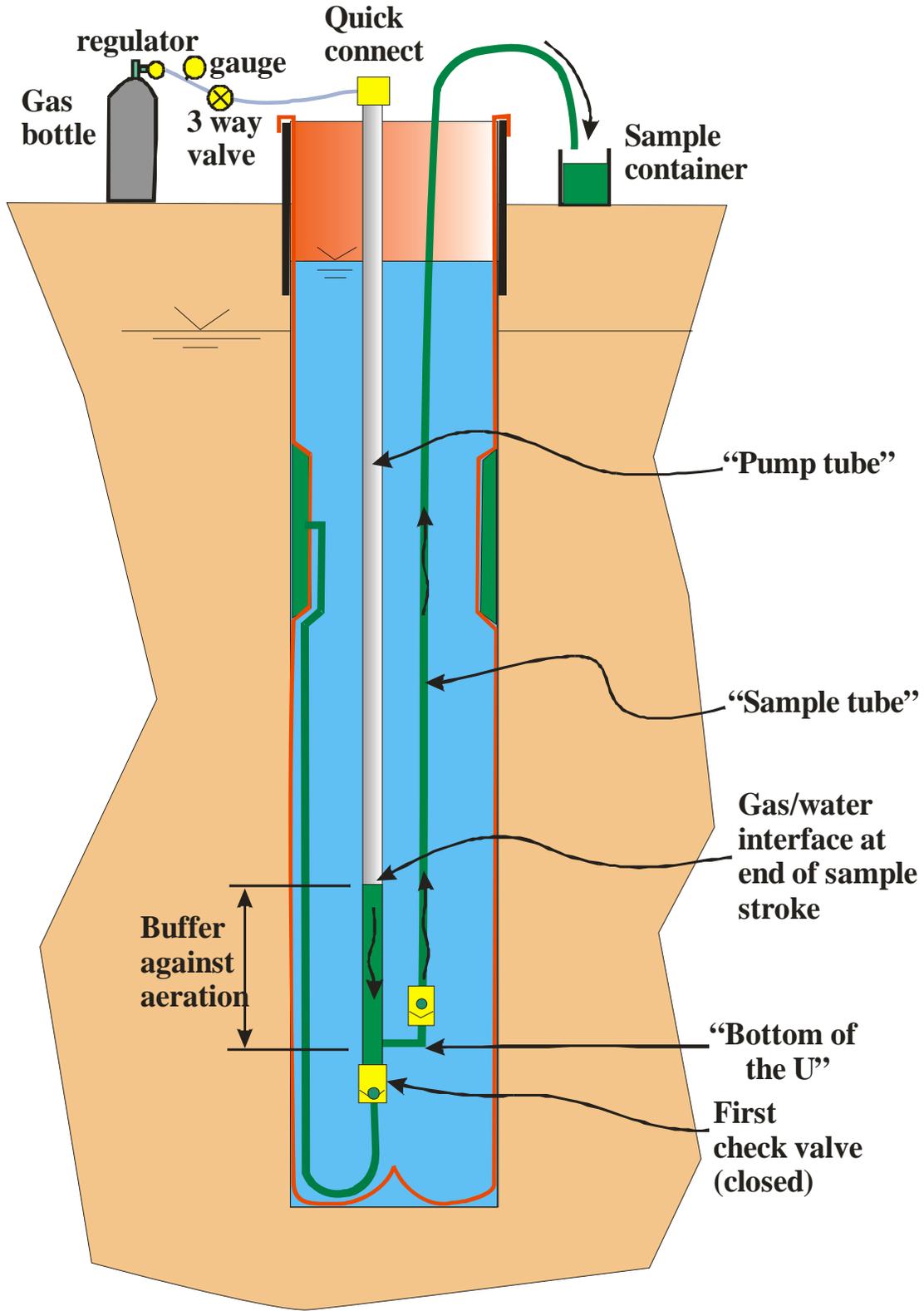
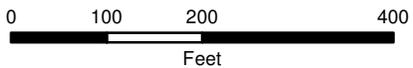


Figure 4. FLUTE Pumping Procedure



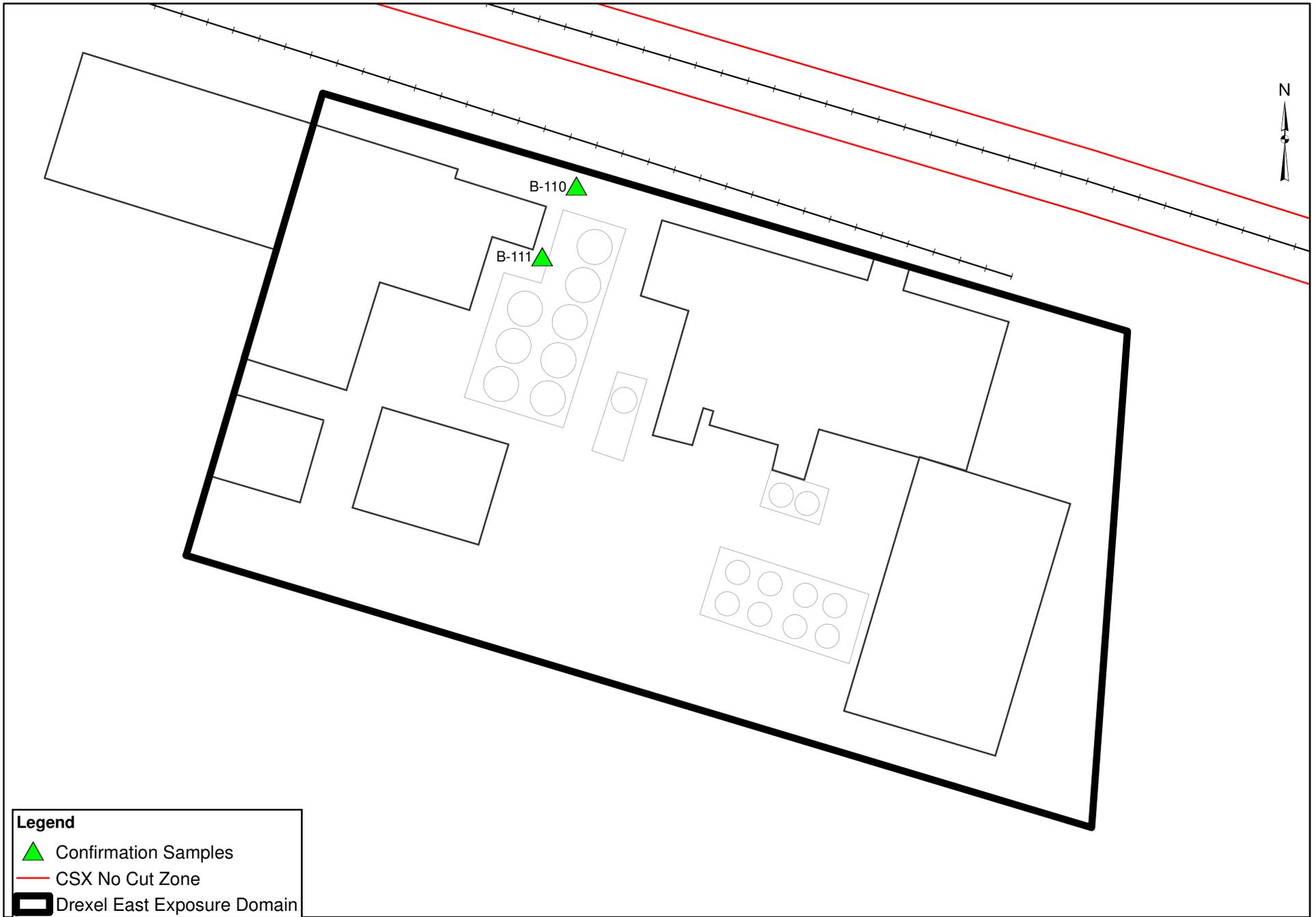


Legend

 Exposure Domains

Exposure Domains

Figure No. 5



Legend

- ▲ Confirmation Samples
- CSX No Cut Zone
- ▭ Drexel East Exposure Domain



Phase 2 - Pre-Remediation Confirmation Sample Locations

APPENDIX A

PROFESSIONAL GEOLOGIST
SUMMARY OF HOURS

10:05 AM
10/17/14

Environmental Planning Specialists, Inc.
Kirk Kessler - PG Hours
April through October 2014

	<u>Apr 14</u>	<u>May 14</u>	<u>Jun 14</u>	<u>Jul 14</u>	<u>Aug 14</u>	<u>Sep 14</u>	<u>Oct 14</u>	<u>TOTAL</u>
Drexel:Consulting								
SP-Senior Principal:SP-Project Support	3.50	0.00	0.50	1.50	0.00	0.00	0.00	5.50
Total Drexel:Consulting	3.50	0.00	0.50	1.50	0.00	0.00	0.00	5.50
Drexel:Project Management								
SP-Senior Principal:SP-Project Support	4.00	2.00	0.00	0.00	0.00	3.50	0.00	9.50
SP-Senior Principal:SP-Teleconference	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00
Total Drexel:Project Management	4.00	3.00	0.00	0.00	0.00	3.50	0.00	10.50
Drexel:Remediation Bid Package								
SP-Senior Principal:SP-Document Preparation	0.00	0.00	0.00	0.00	4.50	0.00	0.00	4.50
SP-Senior Principal:SP-Project Support	0.00	0.00	0.00	0.00	6.50	2.00	2.50	11.00
Total Drexel:Remediation Bid Package	0.00	0.00	0.00	0.00	11.00	2.00	2.50	15.50
Drexel:Status Report								
SP-Senior Principal:SP-Project Support	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
Total Drexel:Status Report	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
TOTAL	9.50	3.00	0.50	1.50	11.00	5.50	2.50	33.50

APPENDIX B

CONCEPTUAL SITE MODEL

APPENDIX B

CONCEPTUAL SITE MODEL

**APPENDIX B
CONCEPTUAL SITE MODEL**

TABLE OF CONTENTS

B	CONCEPTUAL SITE MODEL	B-1
<hr/>		
B.1	Introduction	B-1
B.2	Site Location and Description	B-1
B.3	Ground Surface Features	B-2
B.4	Subsurface Features.....	B-5
	B.4.1 Geological Setting	B-5
	B.4.2 Hydrogeological Setting	B-6
B.5	Environmental Conditions	B-8
	B.5.1 Risk Reduction Standards and Delineation.....	B-8
	B.5.2 Surface Impoundment Remediation.....	B-8
	B.5.3 Nature of Contamination (Post Surface Impoundment Remediation)...	B-9
	B.5.4 Extent of Soil Contamination	B-10
B.6	Conceptual Model for EDB	B-11
	B.6.1 General Physical/Chemical Properties of EDB	B-11
	B.6.2 Empirical On-Site Model	B-12
B.7	Potential Receptors and Exposure Pathways	B-15
B.8	References	B-18

Figures

Figure 1	Site Vicinity - Topographic Map
Figure 2	Site Vicinity - Aerial and Land Use
Figure 3	Facility Layout Plan
Figure 4	Site Drainage Features
Figure 5	Geologic Map
Figure 6	Cross-Section A-A'
Figure 7	Cross-Section B-B'
Figure 8	Historical Groundwater Elevations – November 2005
Figure 9	Current Groundwater Elevations – February 2014
Figure 10	Comparison of Surface Soils (0-2ft) to Delineation Criteria
Figure 11	Comparison of Subsurface Soils 2 to 5 ft to Delineation Criteria
Figure 12	Comparison of Subsurface Soils 5 to 10 ft to Delineation Criteria
Figure 13	Comparison of Subsurface Soils 10 to 20 ft to Delineation Criteria
Figure 14	Comparison of Subsurface Soils 20 to 30 ft to Delineation Criteria
Figure 15	Comparison of Subsurface Soils 30 to 40 ft to Delineation Criteria
Figure 16	Comparison of Subsurface Soils 40 to 50 ft to Delineation Criteria

Figure 17	Comparison of Subsurface Soils 50 to 60 ft to Delineation Criteria
Figure 18	Comparison of Subsurface Soils Greater than 60 ft to Delineation Criteria
Figure 19	Comparison of Groundwater to RRSs
Figure 20	Surface Water Sample Locations
Figure 21	Sediment Sample Locations
Figure 22	Conceptual Site Model

Tables

Table 1	Soil Risk Reduction Standards and Delineation Criteria
Table 2	Groundwater Risk Reduction Standards
Table 3	Summary Comparison of Surface Soil Results to RRSs
Table 4	Summary Comparison of Subsurface Soil Results to RRSs
Table 5	Summary Comparison of Groundwater Results to RRSs

B CONCEPTUAL SITE MODEL

B.1 Introduction

The CSM is intended to establish a common knowledge base about the Site (which includes all the VRP properties) and its environmental condition, to facilitate the development of basic remedial action objectives, and to allow an informed decision regarding possible remedial action measures. This section describes the surface and subsurface features at the Site, discusses the extent of contamination at the Site and discusses the potential receptors and exposure pathways.

B.2 Site Location and Description

Drexel's Pesticide Blending Facility is located approximately four miles east of downtown Cordele and two miles east of U.S. Interstate 75 off of U.S. Highway 280 East. Facility coordinates are 31° 57' 12" North latitude and 83° 43' 02" West longitude. The facility is set in a primarily agricultural and wooded area. The Drexel land parcel (the Facility) is approximately 6.89 acres, bounded on the west by Cape Road, to the north by a railroad, and to the south and east by agricultural land. Figure 1 shows the location of the Site with respect to the City of Cordel. Figure 2 is an aerial photograph (dated 2007) of the Site and immediate vicinity, along with an inset map of the land use interpreted from aerial photography.

The pesticide blending facility contains the following structures (see Figure 3):

- Main Warehouse / Mill Building,
- Middle Warehouse / Munsen Building,
- Liquid Production Building,
- several tank farms,
- Break Room/Locker Building, and
- Laboratory/Office Building.

The facility is served by a side track rail spur, owned by CSX and leased to Drexel, and located on the northern part of the Facility within the Facility's fence line. A chain link fence surrounds the facility. There are two former water supply wells, PW-1 and PW-2, which were used during most of the operational period of the facility. These wells were taken offline in 2003 due to the detection of 1,2-dibromoethane (also referred to as ethylene dibromide, EDB) in the water and were abandoned in 2012. An overall facility layout plan is shown on Figure 3.

In 1902, the property was obtained by the Atlantic and Birmingham Railroad Company from John Bulla. From 1902 until 1960, the Facility was owned and utilized by that railroad and/or its successors (i.e. Atlanta, Birmingham & Coast Railroad Co., and Atlantic Coast Line Railroad Co.). We do not know the specific use of the property by the railroad; however, aerial

photographs between 1937 and 1952 show four residences on the property, which was surrounded by cropland. In November 1960, the facility was purchased by Cotton Producers Association, which later changed its name to Gold Kist, Inc. (Gold Kist). Reportedly, fertilizer production began in the early 1960's and pesticide production followed thereafter. In 1985 Drexel purchased the property from Gold Kist and purchased an adjacent 3 acre agricultural parcel south of the Gold Kist property, bringing the total property size of the Facility to its current size of 6.89 acres.

Records and aerial photography indicate that, by 1962, the facility consisted of a production building, office, rail spur, eight subgrade surface impoundments, and a 235-foot deep water well (PW-1) reportedly used for both potable water and industrial purposes. Aerial photography indicates that, by 1968, an additional production (liquid production) building, attached warehouse, and bulk storage tanks had been constructed. It is unknown exactly when and/or how the first four of the eight surface impoundments were removed from service, or exactly how any were closed out. However, it appears from historical Georgia Environmental Protection Division (GAEPD) inspection reports that, of the eight noted in aerial photography, only four remained in operation by 1982, and none remained in operation by March 1984. It is believed the four western-most impoundments were filled with soil and graded in 1983 (USEPA, 1985). In 1986, Drexel constructed a 40,000 square foot warehouse (referred to as the Mill or New Warehouse) and attached production building over the location of the former (westernmost) surface impoundments. For more information about the operational history, please see the Revised 3013 Site Assessment Report (EPS, 2008).

B.3 Ground Surface Features

The majority of the Facility is flat (0-2% slopes) with a small rise in elevation on the southeast part of the Facility. Drainage features on the Site are indicated on Figure 4. Drainage in the surrounding area, the majority of which is in agricultural use, is primarily to the east, parallel to the CSX rail line along two drainage features, one on each side of the tracks. The north drainage ditch is about 40 feet (ft) wide, and has generally wet soils with areas of standing water. The south drainage is a shallower swale that is also about 40 ft wide, but has generally dry soils. The railroad manages the vegetation along these swales/ditches with intermittent herbicide application. During wet periods, surface water in the south swale flows to the northeast until it reaches a culvert beneath the rail line approximately 800 ft to the east of the Drexel Facility where it runs under a small culvert and joins with the north ditch. The north ditch continues to flow in a southeasterly direction to join with other intermittent stream flowing from the forested area to the north, at which point it turns south through a box culvert under the rail line approximately 3,000 ft to the east of the Drexel Facility. The ditch continues in a southeasterly direction and merges with several other drainage features to become Deep Creek.

The drainage swale that runs along the southern side of the rail is predominantly a dry ditch except during rainfall events (Photograph 1). In contrast, the swale along the north side of the rail line becomes comingled with an intermittent stream and wetlands feature eastward of the Facility. The National Wetlands Inventory classifies this area as a "freshwater forested/shrub wetland." The intermittent stream is a part of this low relief wetland and is not a discrete, incised

channel. Photograph 2 shows where the intermittent stream flows underneath the rail line (approximately 3,000 ft east of the Facility). Irrigation ponds are common in the area and there is one located approximately 100 ft to the north of the Facility and another is located just under 450 ft to the east of the Facility.



**Photograph 1 Drainage Swale on Southern Side of Rail Line
(Facility is on the left; photograph taken facing northwest)**



**Photograph 2 Intermittent Stream on the North Side of the Rail Line East of the Facility
(photograph taken facing west-northwest back toward the Facility)**

The majority of the facility is covered with a concrete apron. A concrete culvert runs underneath the Liquid Production building to the northeast corner of the property. Drexel operates under a National Pollution Discharge Elimination System (NPDES) permit to discharge stormwater runoff at multiple permitted discharge locations; however, the majority of stormwater runoff occurs at Outfall #001 (northeast corner of property) and to a lesser extent, at Outfall #002 (between the Mill and Middle Warehouse buildings). Both outfalls convey surface runoff to the southern CSX mainline railroad swale. The swale pitches to the east. The locations of the outfalls are shown on Figure 4.

Historically, Drexel operations produced a non-contact cooling water discharge from extraction of groundwater from the two production wells. In 2003, Drexel converted to an oil-cooled unit and discontinued the use of both production wells, which were subsequently abandoned in 2012. Drexel provided notice to GAEPD that it was ceasing that permitted discharge.

B.4 Subsurface Features

B.4.1 Geological Setting

B.4.1.1 Regional Geological Setting

Crisp County is located on the western flank of the Coastal Plain Physiographic Province. This province is bounded to the north by the Fall Line separating the Coastal Plain and Piedmont Physiographic Provinces. The coastal plain contains unconsolidated sediments (sands, silts and clays) and consolidated sediments (cemented sands and limestones) dating from Late Cretaceous to Recent age. These sedimentary sequences crop out at progressively younger ages away from the Fall Line to the Atlantic coast. The sedimentary formations dip gently to the south-southeast while thickening in the downdip direction forming wedge-shaped stratigraphic layers (Wait, 1960).

The Coastal Plain Physiographic Province in Crisp County is further divided into three districts. The Fall Line Hills District is exposed in the northwestern portion of the county. The central-southwestern portion of the county contains the Dougherty Plain District, a northeast-trending, wedge-shaped feature characterized by gently rolling low land. The Tifton District occurs in eastern Crisp County characterized by well developed dendritic drainage patterns. The Tifton District slopes in elevation from 480 ft above mean sea level (amsl) in the north to 150 ft amsl in the southeast (Clarke et al., 1976). The city of Cordele is located along the boundary between the Fall Line Hills and Tifton Districts.

The Ocala Limestone of upper Eocene age crops out along the western margin of the county and dips to the south-southeast, underlying the Flint River Formation. The Oligocene-age Flint River Formation is exposed from the western portion of the county to a line (north-south) approximately immediately west of Cordele. The Flint River Formation is also described in the scientific literature as the Suwannee Limestone and residuum. The Flint River Formation underlies the younger Hawthorne Formation of Miocene age from Cordele to the eastern margin of the county (Figure 5). The Hawthorne Formation is also described in the scientific literature as undifferentiated Neogene sediments. Chemical weathering of underlying rocks (especially limestones) creates a thick mantle of sandy clay or residuum. This residuum may be 50 ft or more in thickness.

The Hawthorne Formation is a pale to dark green phosphatic sandy clay with lesser amounts of sand and sandy limestone. The Flint River Formation is a siliceous limestone, sandy limestone and recrystallized limestone. The Ocala Limestone is a white to yellowish-white pure fossiliferous limestone. The Ocala thickens up to 130 ft in the southeastern corner of the county. Beneath the Ocala Limestone exists the Claiborne Group, a sandy limestone and sand with some clay beds. The Claiborne Group is 120 ft thick in the northwest portion of the county, thickening

to 320 ft in the southeastern portion of the county. Underlying the Claiborne is the Wilcox Group, a gray sandy clay and fine sand. The Wilcox Group is nearly uniform in thickness within the county, varying from 120 to 140 ft.

B.4.1.1.2 Site Geology – Residuum (overburden)

Numerous soil borings have been advanced across the Site (see Appendix E of the VIRP for more information about the different site investigations conducted since 1984). Boring logs from soil borings conducted since 2005 are presented in Appendix F of the VIRP. Similarly, well construction diagrams for wells constructed from 2005 - 2012 are presented in Appendix G of the VIRP and the wells constructed in 2013 are presented in Appendix C of the 5th Progress Report. The Lithologic cross-sections are shown in Figures 6 and 7.

The investigations revealed that beneath the topsoil layer, residuum is characterized by a predominantly clay soil texture with pockets of coarser-grained soil. Soil density and clay content increase with depth, with gradational changes in texture beginning at approximately 60-70 ft below ground surface (bgs) to a weathered rock (limestone) condition. As the degree of weathering decreases with further depth, the weathered rock transitions into competent limestone around 100 ft or more bgs.

B.4.2 Hydrogeological Setting

B.4.2.1 Regional Hydrogeological Setting

The Hawthorne and Flint River Formations supply modest yield of water to dug and shallow wells drilled in the eastern half of the county. These formations are not significant in terms of a regional water supply, and are considered as a semi-confining unit to the underlying Floridian aquifer (Ocala Limestone). The clay layer of chemically-weathered residuum of the Ocala is laterally continuous and of substantial thickness in places to create a hydraulic barrier to vertical flow of water, causing perched groundwater conditions.

The Ocala is the uppermost regional water supply of significant yield potential. In the area of the Site, water supply wells may yield up to 400 to 500 gallons per minute (gpm). Structure contour and isopach maps of the Ocala limestone in northeastern Crisp County show the top of the unit occurs as an approximate elevation of 290 ft amsl and the base at about 60 ft amsl (Arora, 1984). The depth to water in the Ocala varies across the county and may be as much as 150 ft bgs in eastern Crisp County.

The Claiborne Group is the principal regional water supply, capable of yields of 1200 gpm. The four City of Cordele water supply wells obtain their supply primarily from the Claiborne and to a lesser extent the underlying Wilcox Group (well numbers 1 and 2 were previously decommissioned; presently the city is served by well numbers 3, 4, 5, and 6). These water supply wells are dispersed and as far as three miles east of the city in the direction of the Drexel Facility. The nearest of the city water supply wells (well number 6) is approximately 4,000 ft northwest of the Facility; well number 6 is cased to a depth of 364 ft bgs with multiple screened intervals extending to a total depth of 600 ft bgs. Structure contour and isopach maps of the Claiborne Group in northeastern Crisp County show the top of the unit occurs as an approximate

elevation of 40 to 80 ft amsl and the base at about 245 to 280 ft below mean sea level (bmsl) (Arora, 1984).

Based upon a regional hydrologic study of the aquifer (Hydrologic Atlas 22), the groundwater flow direction is to the east-southeast (Peck et al., 1999).

B.4.2.2 Site Hydrogeology: Perched Water in Residuum

As mentioned above, perched groundwater conditions are often found in the residuum of the Ocala. Fifteen shallow perched water zone monitoring wells and one deeper perched water zone well offset were installed during the Compliance Status Report (CSR) investigation (Peachtree, 1999 and 2001). Water was reported to occur in each of the well installations, although the depth-to-water varied greatly from 1.3 ft below top of casing to as much as 35.4 ft below top of casing. At the well cluster location (MW-15), the depth-to-water varied from 3.3 ft below top of casing in the shallow well to 27.2 ft below top of casing in the deeper overburden well. In 2004, GeoSyntec Consultants (GeoSyntec) advanced 19 soil borings and direct-push well points (at some locations in excess of 40 ft bgs) across the Site to better understand the Site hydrogeology of the overburden; groundwater was not encountered in any of these borings or well points. Based on this, GeoSyntec concluded at that time that the shallow groundwater is either a localized perched water table condition, or the soils have such low permeabilities in places that water is extremely slow to release from the formation into the borehole/well point. Subsequent studies performed during the RCRA 3013 site assessment (EPS, 2008) proved the hypothesis that the water in the overburden (i.e., subsurface soils overlying the bedrock) is perched water (further detail is provided in Section 4.2.2.1 of Appendix E of the VIRP).

B.4.2.3 Site Hydrogeology: Ocala Limestone Aquifer

The Ocala Limestone underlies the overburden. Two former water supply wells (PW-1 and -2) were installed within the Ocala. PW-1 was approximately 235 ft deep while PW-2 was approximately 270 ft deep. These former water supply wells were cased through the overburden (to prevent soil from collapsing into the well) and partially into the limestone (likely where the rock is loosely cemented and easily friable), and were open-hole installations to their termination depth. These wells were abandoned in 2012. Groundwater at the Site is encountered at approximately 150 ft bgs.

In 2005 three groundwater wells were installed at and near the Site (see Figure 8). Well BW-1 was installed to a depth of 170 ft between Tank Farm #1 and the rail unloading area. Well BW-2 is 179 ft deep and is located at the southeastern corner of the Drexel Facility. Well BW-3, which is 175 ft deep, is located just over 300 ft from the northwest corner of the Drexel Facility. The first approximation of the potentiometric surface at the Site (based on these three wells) was presented in the RCRA 3013 Report (EPS, 2008) and is shown in Figure 8.1 The groundwater flow direction based on these wells was determined to be to the south-southeast. Based on this direction of groundwater flow, a more ideally situated well downgradient from the area of greatest contamination was needed. Therefore, in 2010 another well (BW-4) was installed per an

¹ Note the elevations from the production wells (PW-1 and PW-2) are not used in developing the potentiometric contours as they are not as discrete with screened intervals. It is improper to combine elevations from the production wells with the other on-Site wells that do have discrete screened intervals.

EPD-approved Work Plan (EPS, 2010A). The total depth of the well is 180 ft and is located near the middle of the Drexel Facility's southern fence line. Groundwater depths from BW-1, BW-2, BW-3, and BW-4 were measured in August 2012, which indicated a groundwater flow direction with a more easterly component. Thus, for the purposes of delineation, EPS installed two additional wells in 2013. EPS installed BW-5 with a total well depth of 170 ft east of the Drexel Facility for horizontal delineation. EPS installed BW-5 near former well PW-1 for vertical delineation. BW-6 is a multi-level sampling well (specifically a FLUTE™ well) with sample ports screened at 180-190ft, 280-290ft, and 380-390ft. The potentiometric surface from February 2014 is shown on Figure 9.

B.5 Environmental Conditions

The Site has been investigated on numerous occasions over the years by a number of different parties. EPS has compiled all of these environmental data records into a relational database library. Throughout these investigations, the primary focus has been characterization of soil at the Drexel Facility and rail spur, and soil/sediment along drainage areas off the property. Groundwater has also been investigated. Hundreds of surficial and subsurface soil samples have been characterized for pesticides, herbicides, metals, volatile organic compounds (VOCs), and semi-VOCs (SVOCs). Appendix E of the VIRP contains a summary of the previous site characterization and response actions.

B.5.1 Risk Reduction Standards and Delineation

Drexel has worked with the GAEPD to develop Risk Reduction Standards (RRSs) for the Site. The methodology used to determine the RRS is presented in a technical memorandum to the GAEPD (EPS, 2010B). The RRSs were revised according to EPD's comments in a letter dated December 2, 2010 and presented in the VIRP. These RRSs were approved by the EPD in a letter dated April 28, 2011. The approved soil and groundwater RRSs are shown in Table 1 and Table 2, respectively.

Based on section 12-8-108 of the Georgia Voluntary Remediation Program Act, the soil and groundwater was to be delineated to default residential cleanup standards. Type 1 RRSs were used as the delineation standards and are shown in Tables 1 and 2 for soil and groundwater, respectively. Delineation was discussed in the Fifth Progress Report.

B.5.2 Surface Impoundment Remediation

In November 2013-January 2014 four of the former surface impoundments were remediated by removing the concrete impoundment, soil contained within the impoundment and some soils located around and under the impoundments. See the Sixth Progress Report for more detailed information. The analytical data associated with the soils excavated during this action were excluded from the following section describing the nature of the contamination.

B.5.3 Nature of Contamination (Post Surface Impoundment Remediation)

B.5.3.1 Soil

A summary of the surface soil (≤ 2 ft bgs) data² compared to residential and non-residential soil RRSs is shown in Table 3. Similarly, a summary of subsurface soil (> 2 ft bgs) data compared to subsurface soil RRSs is shown in Table 4. The data set represents a compilation of all data obtained through the multiple phases of the RCRA Section 3013 site assessment as well as the data records from past site assessments³ (dating back to the 1996 Kiber investigation), and recent sampling events. Data associated with soils excavated during the surface impoundment remediation were excluded. Appendix E of the VIRP contains tables showing the historical analytical data. Tables 3 and 4 show comparisons of the maximum concentration of each detected constituent found in the soils to the RRSs. Comparisons are provided for both the non-Residential RRSs (higher of Type 3 and Type 4) and the Residential RRSs (higher of Type 1 and Type 2). These tables also show the number of samples that exceeded the RRS and the number of samples that were analyzed for each constituent (called the frequency of exceedance). For example, a frequency of exceedance of “3/122” means that of 122 samples that were analyzed for that constituent, 3 were above the RRS. This frequency of exceedance is equivalent to 2.5% of the samples (3 divided by 122) exceeding the RRS. An average magnitude of exceedance was calculated for the constituents that had concentrations higher than the Residential RRS. The average magnitude of exceedance is the average detected concentration divided by the Residential RRS. The purpose of this analysis is to identify the primary constituents of potential concern (COPC), which will be the drivers for evaluating potentially applicable remedial action technologies and to establish a preliminary remedial action plan. The COPC can be identified by looking at both the average magnitude of exceedance and the frequency of exceedance. The tables below show the COPCs for surface and subsurface soils. These tables list the constituents that have an average magnitude of exceedance greater than one and have more than 3% of the results exceeding the RRS.

Primary Surface Soil COPCs

Constituent	Average Magnitude of Exceedance	Frequency of Exceedance
Toxaphene	22	13/249 (5%)
Endosulfan sulfate	5.3	6/165 (4%)
Chlordane	2.2	7/200 (4%)
Dimethoate	1.7	5/127 (4%)
Endosulfan II	1.3	8/165 (5%)

² For corrective action at the Site, Drexel considers sediments to be material covered by water the majority of the time. There are many samples that have been designated as sediments that may actually be soils based on this definition. Samples that do not appear (based on GIS coordinates and aerial photographs) to be under water are being considered as soils.

³ Data records from the 1984 and two 1985 sampling events (by EPA) are not incorporated into the presentation of the nature and extent of contamination, due to the age of these data and that the more recent CSR investigations sampled in the same areas as the past events.

Primary Subsurface Soil COPCs

Constituent	Average Magnitude of Exceedance	Frequency of Exceedance
Methyl parathion	142	9/241 (4%)
Disulfoton	72	7/161 (4%)
EDB	40	25/284 (9%)
Toxaphene	15	34/441 (8%)
Chlordane	4.9	18/367 (5%)
o-Xylene	7.1	18/145 (12%)
Ethyl benzene	1.4	11/267 (4%)

The primary COPCs are a mixture of chlorinated pesticides, VOCs and organophosphorus pesticides. The most frequent exceedances are for EDB (9%), toxaphene (8%) and o-xylene (12%) in subsurface soils. The highest average magnitude of exceedance is for methyl parathion in subsurface soils.

B.5.3.2 Groundwater

A summary of groundwater data compared to RRSs is shown in Table 5. The data set represents groundwater data collected from 2010 to the present. This table shows comparisons of the maximum concentration of each detected constituent found in the groundwater to both the Residential and Non-Residential RRSs. The only RRS exceedance in more than one sample is for EDB.

B.5.4 Extent of Soil Contamination

B.5.4.1 Soil

A comparison of the soil characterization to RRSs (Residential and Industrial) is demonstrated graphically in Figures 10 through 18. Each figure corresponds to a depth interval progression in the overburden. Depth intervals are chosen based, in part, upon standard USEPA exposure pathways (e.g., 0-2 ft for surficial exposure) and to provide the vertical dimensions; depth intervals are from 0-2 ft, 2-5 ft, 5-10 ft and 10 ft intervals deeper into subsurface soil thereafter. The green circles indicate locations where all constituents are below the Residential RRS. The purple circles indicate locations where at least one constituent exceeded the Industrial RRS and the blue circles indicate locations with at least one exceedance of a Residential RRS. These figures show that the primary areas of contamination occur along the rail car unloading area and Tank Farm #1 corridor.

B.5.4.2 Groundwater

A comparison of the current groundwater conditions to Residential RRSs is illustrated in Figure 19. This figure shows the locations of the monitoring wells (and the nearest off-Site residential wells) and where the RRS exceedances occur. As mentioned previously, the only RRS exceedance in more than one sample is EDB. The groundwater will be monitored through the allowable timeframe under the VRP regulations to see whether all wells achieve the RRS criteria.

B.5.4.3 Off-Site Sediment and Surface Water

In 2010, sediment and surface water samples were collected from background locations (pond and stream settings) outside the potential influence from the Drexel facility. (More information about this sampling event and the data obtained is presented in Appendix E of the VIRP.) Sediment and surface water background values were determined based on this dataset (see Appendix H of the VIRP).

Surface water samples have been collected in off-Site ponds and drainage features. Several samples were also collected from the two drainage ditches that run parallel to the CSX rail line. The southern swale rarely holds standing water and both are subject to desiccation during periods of low rainfall. The samples from these locations were evaluated in a Revised Screening-Level Ecological Risk Assessment (SLERA) report submitted to GAEPD in January 2012 (EPS 2012). Figure 20 shows the surface water sample locations.

Several sediment samples have been collected in the pond to the east of the main facility and in a pond to the north of the facility. Figure 21 shows the locations of these sediment samples.

B.6 Conceptual Model for EDB

The primary constituent of concern in groundwater (the only constituent that consistently exceeds its RRS) is EDB. This section provides a description of the potential fate and transport mechanisms for EDB and an empirical model for its fate and transport at the Site.

B.6.1 General Physical/Chemical Properties of EDB

EDB is a low-molecular-weight (187.88 g/mol) halogenated hydrocarbon that is more dense than water (specific gravity of 2.172 at 25° C; Windholz, 1983). The fate and transport of EDB through the overburden (soil) to the groundwater table depends on the soil adsorption properties and bioavailability for microbial degradation. The log K_{oc} (soil organic carbon/water partition coefficient) value for EDB is 1.45 (USEPA, 1998), which indicates that EDB has low to moderate soil adsorption and a high mobility in soil. The vapor pressure is 11 mm Hg at 25° C (ATSDR, 1992) and the dimensionless Henry's Law Constant is 0.0133 (USEPA, 1998) indicating that EDB readily volatilizes from dry or moist surfaces. Aerobic biodegradation of EDB in surface soil occurs readily (USEPA, 2004A) and EDB is moderately persistent in deeper soil with a representative half-life of 100 days (Extension Toxicology Network, 2004). Anaerobic biodegradation and abiotic degradation in soil are limited (USEPA, 2004B).

The fate and transport mechanisms of EDB in the groundwater include advection, dispersion, sorption to native organic matter, biodegradation, neutral hydrolysis, and non-biological reactions with sulfide. Adsorption of EDB to suspended solids in the groundwater table is not expected based on its log K_{oc}. The range of retardation ratios (rate of movement of water divided by the rate of movement of EDB) that is expected from sorption of EDB to native organic carbon in aquifers is 1 to 4.1, which corresponds to fraction of organic carbon range of 0.01% to 1% (USEPA, 2008). This indicates very little retardation due to sorption would be expected unless there is a significant amount of organic carbon (which is not characteristic of a limestone aquifer matrix). EDB is resistant to abiotic hydrolysis, with a hydrolytic half-life

ranging from 6 to 13.2 years (USEPA, 2004A and 2004B). However, at higher concentrations (above 0.2 mg/L), EDB can be abiotically transformed through a reaction with sulfide (USEPA, 2008). The biodegradation half-life under anaerobic conditions (which is the state of the groundwater at the Site) is 15 to 50 days (USEPA, 2006). The range of first order rate constants for anaerobic degradation of EDB in aquifer sediments is 0.03 to 17 per year (USEPA, 2008). Using these decay rates and the following reaction equation

$$C_t / C_o = e^{kt}$$

where

C_t = concentration at some time t ; use the RRS of 0.00009 mg/L

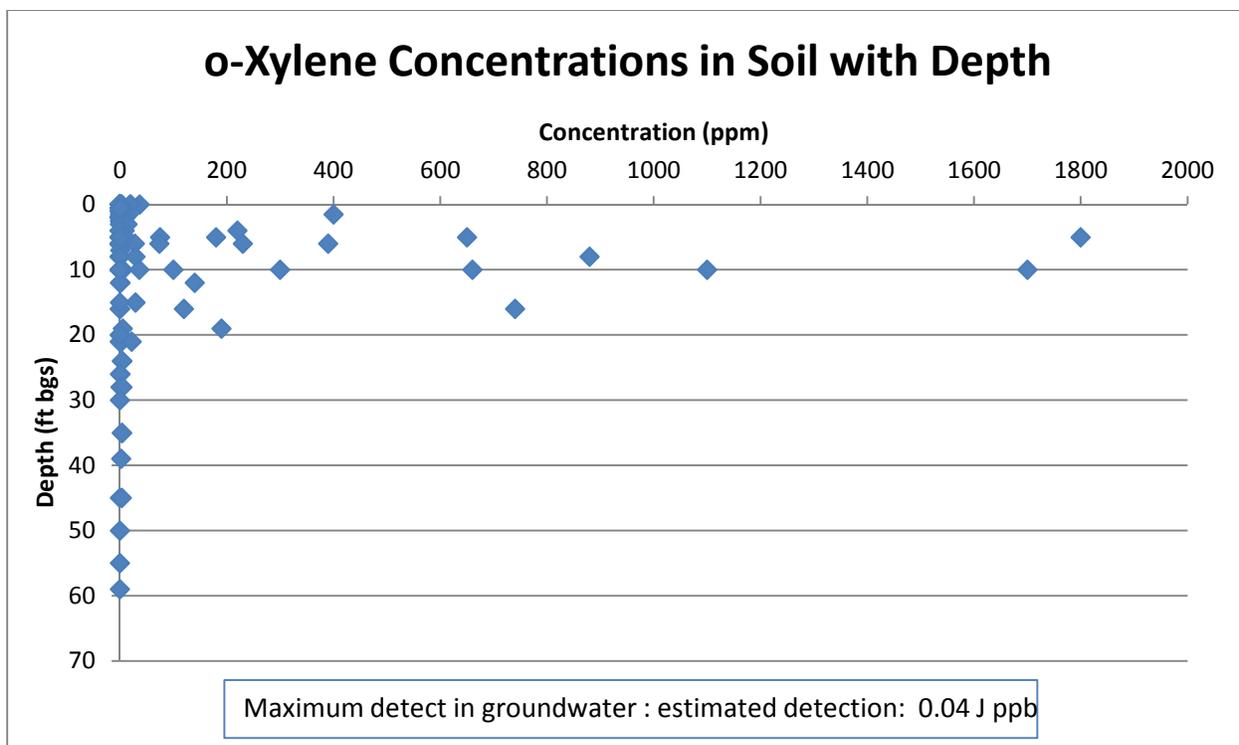
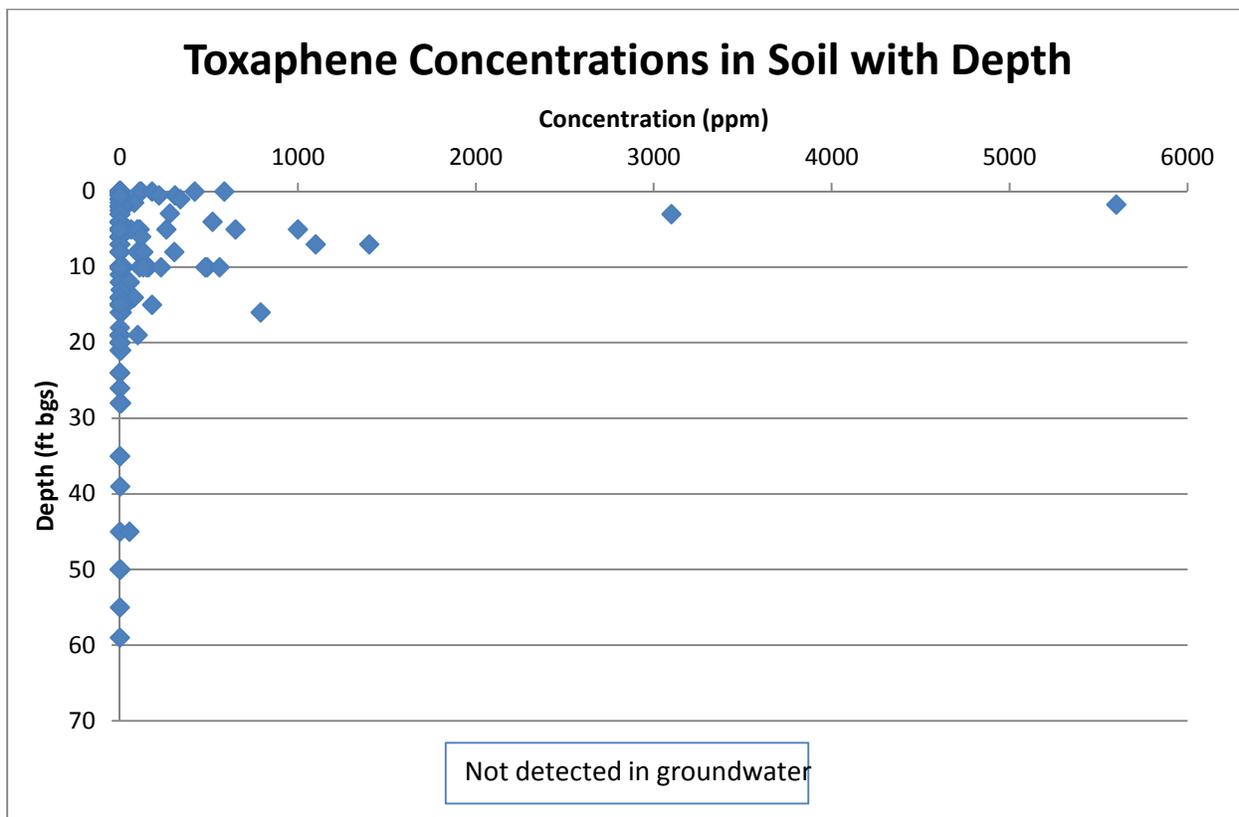
C_o = initial concentration; use March 2013 result of 0.00042 mg/L from BW-1

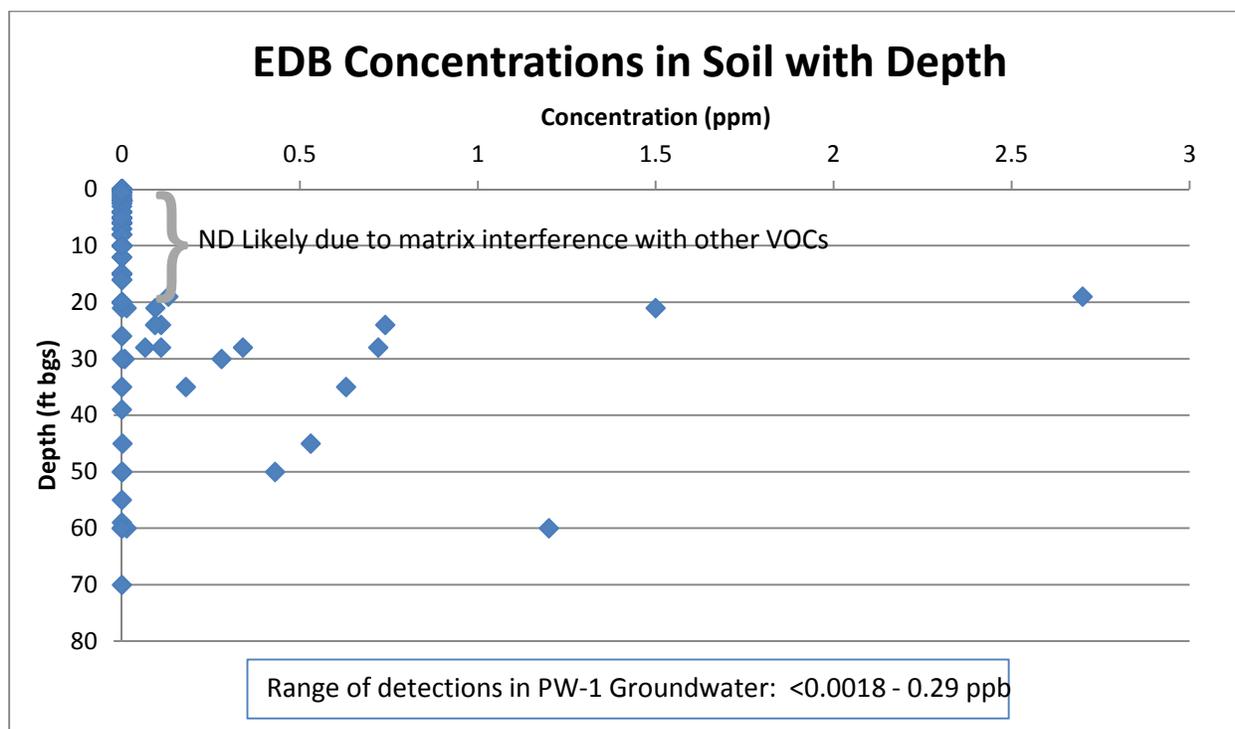
k = first order rate constant; to be conservative, use 0.1 per year,

the resulting time until the RRS is reached (using a conservative rate constant) is modeled to be 15.4 years.

B.6.2 Empirical On-Site Model

The empirical evidence indicates that the leaching of constituents to groundwater is either not occurring or is not significant. The concentrations of constituents in the overburden decrease with depth. The graphs below for three of the primary soil COPCs demonstrate this decreasing concentration with depth below the ground surface. Despite the age of the facility (in operation since the 1960s) and the high concentrations seen in the overburden, only one constituent has been consistently detected above its RRS in groundwater. And this constituent (EDB) has only been above its RRS consistently in three existing wells (BW-1, BW-5, and BW-6) and one abandoned well (PW-1) and at low concentrations.





The highest concentrations of toxaphene and o-xylene in soil (along with other constituents) occur in the 0-20 ft bgs range. EDB is not detected at these shallow depths in soil, but is detected below 20 ft bgs. It is believed that the high concentrations of VOCs and pesticides in the 0-20 ft bgs range are causing matrix interferences for EDB.

The model described below and shown on Figure 22 provides an explanation as to how EDB may be found in the groundwater when leaching is not a significant factor at the Site. The groundwater aquifer, which is located in the limestone has very low concentrations of EDB. Considerably higher concentrations of EDB have been reported in perched water found in the overburden. Samples of the perched water have been collected in the area of high soil contamination (DC-14N) and near this area (MW-15, MW-15D). In 2000, a high concentration (3,200 µg/L) of EDB was found in perched water that was sampled while collecting a soil sample at location DC-14N. Nearby monitoring wells placed in the overburden (MW-15 and associated deeper overburden well MW-15D) had a concentration of 53 µg/L in 2000 and 80 µg/L in July of 2003⁴. During the same time period (2000-2003) PW-1 (which was located in the limestone aquifer downgradient of the area of high soil concentrations) had concentrations of <0.0021 – 0.21 µg/L. Well BW-1 (located near DC-14N in the area of higher soil contamination) was constructed in 2005 in the limestone aquifer. Concentrations in this well have ranged from non-detect to 0.42 µg/L.

⁴ Samples collected in 2000 were labeled MW-15 and DW-1. Samples collected in 2000 by the EPD were labeled as MW-7 and MW-7D.

The production wells had an open borehole construction in the limestone bedrock. In 2005 downhole geophysical logging was performed on PW-1 and PW-2 (see Appendix E of the VIRP for more information). It was determined that the casings for these wells were not sealed. It is likely that the contaminated perched water migrated downward through the overburden then migrated vertically downward through the unsealed casings of PW-1, resulting in the presence of constituents in the limestone aquifer.

B.7 Potential Receptors and Exposure Pathways

The Drexel plant is an isolated industrial facility that is set in a primarily agricultural area. The facility is not connected to city water or city sewer. The Facility is approximately 6.89 acres bounded on the west by Cape Road, to the north by a railroad, and to the south and east by private agricultural land. All of the facility's pesticide blending operations take place on the northern half of the property; the southern half was purchased for future expansion and is presently used primarily for employee and visitor parking. A septic drain field is also present on the southern half of the property. The Facility is completely enclosed with an 8-foot chain link fence.

Drexel currently employs approximately 25 people at the Cordele facility. Potable water for employee use has been delivered to the facility from an outside vendor since Drexel ceased operations of the facility water supply wells. A literature-based well survey (Peachtree, 2001), identified three public water supply wells within a three mile radius of the property. These wells were determined to be located approximately 11,000 ft northwest, 4,000 ft northwest, 8,500 ft northeast of the Property, with depths upwards of 600 ft bgs. Nine private domestic-supply wells have been identified within a one half-mile radius of the property. The nearest private well downgradient of the Facility is at the Akin residence (100 Cape Rd.), approximately 383 ft south of the Facility's fence line. However, this well is not currently in operation and the power supply has been shut-off. There is an abandoned residential well (Well D) that is approximately 460 ft southeast of the Facility's fenceline. There is also a private well approximately 110 ft north of the Facility's fence line at the Stewart residence (140 Cape Rd.); this well is upgradient of the groundwater flow direction.

The adjoining properties are used for residential or agricultural purposes or are currently vacant. In October 2009, Drexel purchased additional parcels of land comprising approximately 35.2 acres. Several of these are contiguous parcels, totaling 32.2 acres, which border the southern and eastern boundaries of the Facility. These additional parcels owned by Drexel are currently vacant.

Now that the surface impoundment remediation is complete, the remaining area of soil contamination is focused on one operational area of the Facility: the Rail Car Unloading Area. Note that most areas are covered by buildings, pavement, or rock ballast. The current and/or potential future human receptors are listed below along with a brief discussion of the rationale behind their identification and the pathways through which they could potentially be exposed to regulated substances associated with releases at the Site.

- **Current/Future Site Worker:** There are currently approximately 25 workers at the Site, the majority of which work approximately 40 hours per week. It is anticipated that the facility will continue to operate in its current capacity for the foreseeable future. Receptors associated with this type of land use can potentially have long-term exposure to site-related chemicals in surface soil (0-2 ft bgs) via ingestion, dermal contact, and inhalation of volatiles in outdoor air. There is some potential for Site workers to be exposed to several of the more volatile COPC potentially migrating from impacted perched water and vadose zone soils to the indoor air of existing and/or future buildings. It is anticipated that if such vapor migration is occurring that the concentrations of these chemicals in indoor air would be well below the applicable OSHA standards.
- **Future Construction Worker:** No construction activities are currently planned at the Property, however, it is possible that additional buildings could be constructed on the Property in the future. Construction workers could potentially have short-term (<1 year) exposure to chemicals in mixed surface and subsurface soil (0-10 ft bgs) via ingestion, dermal contact, and inhalation of volatiles and particulates.
- **Current/Future Off-Site Residents:** There are several residential properties in relatively close proximity to the Site. Drexel's purchase of several adjoining parcels in 2009 serves to limit the potential for expanding residential use of the off-Site areas. In general, it is assumed that nearby residents could have long term exposure, as children through adulthood, to Site-related chemicals in surface soil (0-2 ft bgs) via ingestion, dermal contact, and inhalation of volatiles and particulates. Although no Site-related chemicals have been detected above relevant drinking water standards in off-Site groundwater, the presence of private residential water supply wells in close proximity to the Site offers the potential for exposure of future residents via ingestion, dermal contact, and inhalation of vapors associated with groundwater.

The on-Site areas impacted by the release of regulated substances are mostly covered by pavement, buildings, or rock ballast with rail. The area does not represent quality habitat for wildlife as it lacks natural vegetative cover and is unlikely to have substantial vegetative cover in the future due to ongoing facility operations. Facility operations and maintenance activities will continue to disrupt wildlife and cause animals to seek less frequently disturbed areas. In addition, any remedial actions to reduce potential human health exposures should also serve to reduce any potential ecological exposures.

The Georgia Natural Heritage Program provides a listing of "Known Locations of Rare and Other Special Concern Animals, Plants and Natural Communities within Georgia" organized by topographic quadrangle. The Site is located within the Penia Quadrangle. No sensitive animals were identified within this quadrangle. The sensitive plants within this quadrangle are the Cutleaf Beardtongue (*Penstemon dissectus*) and the Awned Meadowbeauty (*Rhexia aristosa*). Neither of these plants has been observed at the Site or in the surrounding area.

Because of documented releases of regulated substances into the drainage swales along the rail line to the northeast of the Site, the Screening Level Environmental Risk Assessment (SLERA; EPS 2010B) included a preliminary evaluation of terrestrial and aquatic organisms that could potentially be exposed in these areas. Theoretical potential exposure pathways for terrestrial and aquatic organisms are root absorption, ingestion (e.g., surface soil/sediment, surface water, and biota), dermal absorption, and inhalation.

With respect to potential ecological risks to off-Site receptors, the SLERA report (EPS 2010B) concluded that there is a modest potential for adverse ecological effects to terrestrial and semi-aquatic receptors from several Site-related substances in off-Site soil and sediments. The potential risk appears to be driven by relatively localized impacts in the drainage swale and ditch that border the rail line immediately north of the Site.

B.8 References

- Arora, Ram Dr., 1984. *Hydrogeological Evaluation for Underground Injection Control in the Coastal Plain of Georgia*. Georgia Department of Natural Resources, Environmental Protection Division, Georgia Geological Survey, Hydrologic Atlas 10, Plates 19, 20, and 21.
- Agency for Toxic Substances and Disease Registry (ATSDR). 1992. *Toxicological Profile for 1,2-Dibromoethane*. U.S. Department of Health and Human Services, Public Health Service.
- Clarke, W.R., and A.C. Zisa, 1976. *Physiographic Map of Georgia*, Georgia Department of Natural Resources, Geologic and Water Resources Division.
- Environmental Planning Specialists, Inc. (EPS), July 2008. *Revised RCRA Section 3013 Site Assessment Report*.
- Environmental Planning Specialists, Inc. (EPS), 2010A. *Workplan for Pre-Corrective Plan Development Sampling*. January.
- Environmental Planning Specialists, Inc. (EPS), 2010B. *Technical Memorandum Revision 2: Development of Soil- and Groundwater-based Risk Reduction Standards*. July.
- Environmental Planning Specialists, Inc. (EPS), 2011. *Voluntary Remediation Program Application*. February.
- Environmental Planning Specialists, Inc. (EPS), 2012. *Revised Ecological Risk Assessment Steps 1 – 3A*. January.
- Extension Toxicology Network. 2004. *Pesticide Information Profiles for Ethylene Dibromide*. Accessed on November 1, 2004. Online address: <http://extoxnet.orst.edu/pips.edb.htm>.
- Peachtree Environmental Incorporated. March 1999. *Compliance Status Report, Pesticide Blending Facility*, Cordele, Crisp County, Georgia.
- Peachtree Environmental Incorporated. June 2001. *Compliance Status Report Addendum, Pesticide Blending Facility*, Cordele, Crisp County, Georgia.
- Peck, M.R., J.S. Clarke, C. Ransom III, and C.J. Richards, 1999. *Potentiometric Surface of the Upper Floridian Aquifer in Georgia and Adjacent Parts of Alabama, Florida, and South Carolina, May 1998, and Water-Level Trends in Georgia, 1990-98*.
- United States Environmental Protection Agency (USEPA). 1998. *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume 2, Appendix A: Chemical Specific Data*
- United States Environmental Protection Agency (USEPA). 2004A. *Technical Fact Sheet on Ethylene Dibromide*. Website accessed on September 17, 2004. Online address: <http://www.epa.gov/safewater/dwh/t-soc/edb.html>

- United States Environmental Protection Agency (USEPA). 2004B. *Toxicological Review of 1,2-Dibromoethane: In Support of Summary Information on the Integrated Risk Information System (IRIS)*.
- United States Environmental Protection Agency (USEPA). 2006. *Lead Scavengers Compendium: Overview of Properties, Occurrence, and Remedial Technologies*. May.
- United States Environmental Protection Agency (USEPA). 2008. *Natural Attenuation of the Lead Scavengers 1,2-Dibromoethane (EDB) and 1,2-Dichloroethane (1,2-DCA) at Motor Fuel Release Sites and Implications for Risk Management*. September.
- United States Environmental Protection Agency (USEPA) Region IV, ESD, HWS, Kenneth Barry. February 1985. *Potential Hazardous Waste Site, Site Inspection Report (PHWSIR)*, Gold Kist Chemical Company, Cordele, Georgia.
- United States Environmental Protection Agency (USEPA), Region IV, Environmental Services Division, ESD project No. 85-123. February 1985. *Site Screening Report, Gold Kist Chemical Company/Lyndall Chemical, Cordele, Georgia*,
- Wait, R.L., 1960. *Source and Quality of Ground Water in Southwestern Georgia*, Georgia Department of Mines, Mining, and Geological Survey, Information Circular 18.
- Windholz, Martha, ed. 1983. *The Merck Index* (10th Ed.) Rahway, N.J., Merck and Company, Inc.

Table 1. Soil Risk Reduction Standards and Delineation Criteria (mg/kg)

CAS #	Constituent	Delineation Standard: Type 1 RRS	Type 2 RRS	Residential RRS*	Type 3 SS RRS	Type 3 SbS RRS	Type 4 SS RRS	Type 4 SbS RRS	Cleanup Standard: Non Residential SS RRS**	Cleanup Standard: Non Residential SbS RRS**
Noncarcinogenic Polycyclic Aromatic Hydrocarbons (PAHs)										
83-32-9	Acenaphthene	300	408	408	300	300	1244	1244	1244	1244
120-12-7	Anthracene	500	3121	3121	500	500	20584	20584	20584	20584
208-96-8	Acenaphthylene	130	Bkg/DL	130	130	130	Bkg/DL	Bkg/DL	130	130
191-24-2	Benzo(g,h,i)perylene	500	Bkg/DL	500	500	500	Bkg/DL	Bkg/DL	500	500
206-44-0	Fluoranthene	500	2224	2224	500	500	9118	9118	9118	9118
86-73-7	Fluorene	360	364	364	360	360	1492	1492	1492	1492
91-20-3	Naphthalene	100	1.3	100	100	100	1.3	1.3	100	100
85-01-8	Phenanthrene	110	Bkg/DL	110	110	110	Bkg/DL	Bkg/DL	110	110
129-00-0	Pyrene	500	2184	2184	500	500	6770	6770	6770	6770
Carcinogenic PAHs										
56-55-3	Benzo(a)anthracene	5	7.1	7.1	5	5	28	28	28	28
205-99-2	Benzo(b)fluoranthene	5	12	12	5	5	78	96	78	96
207-08-9	Benzo(k)fluoranthene	5	125	125	5	5	784	940	784	940
50-32-8	Benzo(a)pyrene	1.6	1.2	1.6	1.64	1.64	7.8	9.4	7.8	9.4
218-01-9	Chrysene	5	867	867	5	5	2817	2817	2817	2817
53-70-3	Dibenzo(a,h)anthracene	2	1.2	2	5	5	7.8	31	7.8	31
193-39-5	Indeno(1,2,3-cd)pyrene	5	12	12	5	5	78	312	78	312
Inorganic chemicals										
7440-36-0	Antimony	4	5.4	5.4	10	10	36	36	36	36
7440-38-2	Arsenic	20	5.8	20	38	41	5.8	5.8	38	41
7440-39-3	Barium	1000	2554	2554	1000	1000	16480	16480	16480	16480
7440-41-7	Beryllium	2	156	156	3	3	3161	3161	3161	3161
7440-43-9	Cadmium (food or soil)	2	7.5	7.5	39	39	150	150	150	150
	Chromium (unspeciated)	100	38	100	1200	1200	38	38	1200	1200
16065-83-1	Chromium (III)	100	117321	100000	1200	1200	3000000	6E+09	100000	100000 ***
18540-29-9	Chromium (VI)	100	18	100	109	1200	38	38	109	1200
7440-50-8	Copper	100	915	915	1500	1500	2886	2886	2886	2886
57-12-5	Cyanide	20	40	40	20	20	40	40	40	40
7439-92-1	Lead	75	270	270	400	400	270	270	400	400
7439-97-6	Mercury	0.5	2.1	2.1	17	17	2.1	2.1	17	17
7440-02-0	Nickel	50	404	404	420	420	2608	2608	2608	2608
7782-49-2	Selenium	2	8.3	8.3	36	36	52	52	52	52
7440-22-4	Silver	2	17	17	10	10	85	85	85	85

Table 1. Soil Risk Reduction Standards and Delineation Criteria (mg/kg)

CAS #	Constituent	Delineation Standard: Type 1 RRS	Type 2 RRS	Residential RRS*	Type 3 SS RRS	Type 3 SbS RRS	Type 4 SS RRS	Type 4 SbS RRS	Cleanup Standard: Non Residential SS RRS**	Cleanup Standard: Non Residential SbS RRS**
7440-28-0	Thallium	2	2.8	2.8	10	10	2.8	2.8	10	10
7440-66-6	Zinc	100	5847	5847	2800	2800	38564	38564	38564	38564
Other Chemicals										
540-54-5	1-Chloropropane (2,2'-Oxybis)	DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
96-18-4	1,2,3-Trichloropropane	0.5	0.3	0.5	1.9	4	0.35	0.35	1.9	4
120-82-1	1,2,4-Trichlorobenzene	10.83	4.1	10.83	10.83	10.83	4.1	4.1	10.83	10.83
106-93-4	1,2-Dibromoethane (EDB)	0.01	0.0006	0.01	0.01	0.01	0.0006	0.0006	0.01	0.01
95-50-1	1,2-Dichlorobenzene	60	12	60	60	60	12	12	60	60
78-87-5	1,2-Dichloropropane	0.5	0.03	0.5	0.5	0.5	0.05	0.05	0.5	0.5
541-73-1	1,3-Dichlorobenzene	60	13	60	60	60	13	13	60	60
106-46-7	1,4-Dichlorobenzene	7.5	1.4	7.5	7.5	7.5	1.4	1.4	7.5	7.5
95-95-4	2,4,5-Trichlorophenol	400	304	400	400	400	760	760	760	760
93-72-1	2,4,5-TP (Silvex)	10	1.4	10	10	10	8.8	8.8	10	10
88-06-2	2,4,6-Trichlorophenol	3	2.3	3	3	3	7.6	7.6	7.6	7.6
94-75-7	2,4-D	7	0.83	7	7	7	5.2	5.2	7	7
120-83-2	2,4-Dichlorophenol	2	1.2	2	2	2	7.3	7.3	7.3	7.3
105-67-9	2,4-Dimethylphenol	70	17	70	70	70	47	47	70	70
51-28-5	2,4-Dinitrophenol	7	1.6	7	7	7	4.5	4.5	7	7
121-14-2	2,4-Dinitrotoluene	0.66	0.08	0.66	0.66	0.66	0.25	0.25	0.66	0.66
606-20-2	2,6-Dinitrotoluene	0.76	0.56	0.76	0.76	0.76	2.8	2.8	2.8	2.8
78-93-3	2-Butanone (MEK)	200	9.6	200	200	200	50	50	200	200
91-58-7	2-Chloronaphthalene	25	135	135	25	25	853	853	853	853
95-57-8	2-Chlorophenol	4	1.3	4	4	4	8.1	8.1	8.1	8.1
95-48-7	2-Methylphenol	3.8	13	13	3.8	3.8	83	83	83	83
88-75-5	2-Nitrophenol	DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
91-94-1	3,3'-Dichlorobenzidine	25	0.26	25	25	25	0.79	0.79	25	25
108-39-4	3-Methylphenol	3.8	13	13	3.8	3.8	82	82	82	82
106-44-5	4-Methylphenol	3.8	1.3	3.8	3.8	3.8	8	8	8	8
7005-72-3	4-Chlorophenyl-phenylether	DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
72-54-8	4,4'-DDD	0.66	19	19	0.66	0.66	47	47	47	47
72-55-9	4,4'-DDE	0.66	14	14	0.66	0.66	38	38	38	38
50-29-3	4,4'-DDT	0.66	20	20	0.66	0.66	54	54	54	54
106-47-8	4-Chloroaniline	10	0.86	10	10	10	0.86	0.86	10	10
59-50-7	4-Chloro-3-methylphenol	13	38	38	13.2	13.2	236	236	236	236

Table 1. Soil Risk Reduction Standards and Delineation Criteria (mg/kg)

CAS #	Constituent	Delineation Standard: Type 1 RRS	Type 2 RRS	Residential RRS*	Type 3 SS RRS	Type 3 SbS RRS	Type 4 SS RRS	Type 4 SbS RRS	Cleanup Standard: Non Residential SS RRS**	Cleanup Standard: Non Residential SbS RRS**
100-02-7	4-Nitrophenol	6	0.98	6	6	6	0.98	0.98	6	6
67-64-1	Acetone	400	33	400	400	400	189	189	400	400
309-00-2	Aldrin	0.66	0.16	0.66	0.66	0.66	0.66	0.66	0.66	0.66
319-84-6	alpha-BHC	0.66	0.01	0.66	0.66	0.66	0.06	0.06	0.66	0.66
86-50-0	Azinphos-methyl	10	0.3	10	10	10	1.9	1.9	10	10
71-43-2	Benzene	0.5	0.05	0.5	0.5	0.5	0.09	0.09	0.5	0.5
319-85-7	beta-BHC (Hexachlorocyclohexane, Beta-)	0.66	0.06	0.66	0.66	0.66	0.23	0.23	0.66	0.66
111-91-1	bis(2-Chloroethoxy)methane	0.03	0.23	0.23	0.027	0.027	1.4	1.4	1.4	1.4
111-44-4	bis(2-Chloroethyl) ether	0.6	0.001	0.6	0.6	0.6	0.001	0.001	0.6	0.6
117-81-7	bis(2-Ethylhexyl) phthalate	50	287	287	50	50	957	957	957	957
74-83-9	Bromomethane	1	0.05	1	1	1	0.05	0.05	1	1
85-68-7	Butylbenzylphthalate	50	128	128	50	50	426	426	426	426
63-25-2	Carbaryl	70	29	70	70	70	182	182	182	182
75-15-0	Carbon disulfide	400	23	400	400	400	23	23	400	400
56-23-5	Carbon tetrachloride	0.5	0.05	0.5	0.5	0.5	0.08	0.08	0.5	0.5
57-74-9	Chlordane	9.2	2.7	9.2	9.2	9.2	2.7	2.7	9.2	9.2
108-90-7	Chlorobenzene	10	1.4	10	10	10	1.9	1.9	10	10
75-00-3	Chloroethane	0.17	34	34	0.17	0.17	163	163	163	163
2921-88-2	Chlorpyrifos	2	15	15	2	2	94	94	94	94
56-72-4	Coumaphos	1	Bkg/DL	1	1	1	Bkg/DL	Bkg/DL	1	1
108-94-1	Cyclohexanone	20	359	359	20	20	2351	2351	2351	2351
75-99-0	Dalapon	20	1.9	20	20	20	13	13	20	20
319-86-8	delta-BHC	DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
333-41-5	Diazinon	1	1.3	1.3	1	1	8.8	8.8	8.8	8.8
124-48-1	Dibromochloromethane	10	0.53	10	10	10	0.53	0.53	10	10
1918-00-9	Dicamba	20	2.4	20	20	20	16	16	20	20
75-09-2	Dichloromethane (Methylene chloride)	0.5	0.3	0.5	0.5	0.5	0.6	0.6	0.6	0.6
60-57-1	Dieldrin	0.66	0.04	0.66	0.66	0.66	0.16	0.16	0.66	0.66
84-66-2	Diethylphthalate	500	107	500	500	500	672	672	672	672
60-51-5	Dimethoate	0.7	0.03	0.7	0.7	0.7	0.09	0.09	0.7	0.7
131-11-3	Dimethylphthalate	40000	6240	40000	40000	40000	6240	6240	40000	40000
87-74-2	Di-n-butylphthalate	400	200	400	400	400	500	500	500	500
117-84-0	Di-n-octylphthalate	70	5491	5491	70	70	5491	5491	5491	5491
88-85-7	Dinoseb (DNBP)	0.7	3.5	3.5	0.7	0.7	18	18	18	18
298-04-4	Disulfoton	0.03	0.02	0.03	0.03	0.03	0.15	0.15	0.15	0.15

Table 1. Soil Risk Reduction Standards and Delineation Criteria (mg/kg)

CAS #	Constituent	Delineation Standard: Type 1 RRS	Type 2 RRS	Residential RRS*	Type 3 SS RRS	Type 3 SbS RRS	Type 4 SS RRS	Type 4 SbS RRS	Cleanup Standard: Non Residential SS RRS**	Cleanup Standard: Non Residential SbS RRS**
115-29-7	Endosulfan I	10	26	26	10	10	170	170	170	170
33213-65-9	Endosulfan II	10	1.8	10	10	10	1.8	1.8	10	10
1031-07-8	Endosulfan sulfate	1.65	Bkg/DL	1.65	1.65	1.65	Bkg/DL	Bkg/DL	1.65	1.65
72-20-8	Endrin	10	4	10	10	10	24	24	24	24
7421-93-4	Endrin aldehyde	10	Bkg/DL	10	10	10	Bkg/DL	Bkg/DL	10	10
2104-64-5	EPN	6.4	0.12	6.4	20	Bkg/DL	0.62	0.62	20	6.4 ****
100-41-4	Ethyl benzene	70	16	70	70	70	16	16	70	70
115-90-2	Fensulfothion	10	Bkg/DL	10	10	10	Bkg/DL	Bkg/DL	10	10
58-89-9	gamma-BHC (Lindane)	0.66	0.12	0.66	0.66	0.66	0.35	0.35	0.66	0.66
76-44-8	Heptachlor	0.66	0.67	0.67	0.66	0.66	0.83	0.83	0.83	0.83
1024-57-3	Heptachlor epoxide	1.6	0.08	1.6	1.65	1.65	0.12	0.12	1.65	1.65
118-74-1	Hexachlorobenzene	2.1	0.24	2.1	2.14	2.14	0.49	0.49	2.14	2.14
87-68-3	Hexachlorobutadiene	17.5	0.78	17.5	17.5	17.5	3.9	3.9	17.5	17.5
77-47-4	Hexachlorocyclopentadiene	15	5.6	15	15.2	15.2	37	37	37	37
67-72-1	Hexachloroethane	10	0.24	10	10.0	10.0	1.2	1.2	10	10
78-59-1	Isophorone	10	5.9	10	10	10	20	20	20	20
98-82-8	Isopropylbenzene (cumene)	22	6.9	22	21.88	21.88	33	33	33	33
121-75-5	Malathion	20	1.6	20	20	20	10	10	20	20
72-43-5	Methoxychlor	10	87	87	10	10	542	542	542	542
298-00-0	Methyl parathion	0.2	0.14	0.2	0.2	0.2	1	1	1	1
7786-34-7	Mevinphos	10	Bkg/DL	10	10	10	Bkg/DL	Bkg/DL	10	10
98-95-3	Nitrobenzene	2	0.26	2	2	2	0.26	0.26	2	2
56-38-2	Parathion	20	20	20	20	20	60	60	60	60
87-86-5	Pentachlorophenol	3.3	1.4	3.3	3.3	3.3	4	4	4	4
108-95-2	Phenol	400	54	400	400	400	353	353	400	400
100-42-5	Styrene	14	11	14	14	14	57	57	57	57
127-18-4	Tetrachloroethene	0.5	0.05	0.5	0.5	0.5	0.05	0.05	0.5	0.5
108-88-3	Toluene	100	14	100	100	100	72	72	100	100
8001-35-2	Toxaphene	10.88	8.3	10.88	10.88	10.88	9.3	9.3	10.88	10.88
79-01-6	Trichloroethene	0.5	0.21	0.5	0.5	0.5	0.28	0.28	0.5	0.5
95-47-6	o-Xylene	20	7.3	20	20	20	38	38	38	38

* Higher of Type 1 and Type 2 RRS

** Higher of Type 3 and Type 4 RRS

*** Maximum value is 100,000

**** If Type 3/4 RRS is less than Type 1/2 value, then Type 1/2 value used

SS = Surface Soil (<= 2')

SbS = Subsurface Soil (>2')

Table 2. Groundwater Risk Reduction Standards (mg/L)

CAS #	Constituent	Delineation Standard: Type 1 RRS	Type 2 RRS	Residential GW RRS*	Type 3 RRS	Type 4 RRS	Non-Residential RRS**
Noncarcinogenic Polycyclic Aromatic Hydrocarbons (PAHs)							
83-32-9	Acenaphthene	2	0.94	2	2	6.1	6.1
120-12-7	Anthracene	Bkg/DL	4.7	4.7	Bkg/DL	31	31
208-96-8	Acenaphthylene	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
191-24-2	Benzo(g,h,i)perylene	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
206-44-0	Fluoranthene	1	0.63	1	1	4.1	4.1
86-73-7	Fluorene	1	0.63	1	1	4.1	4.1
91-20-3	Naphthalene	0.02	0.002	0.02	0.02	0.009	0.02
85-01-8	Phenanthrene	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
129-00-0	Pyrene	1	0.47	1	1	3.1	3.1
Carcinogenic PAHs							
56-55-3	Benzo(a)anthracene	0.0001	0.001	0.001	0.0001	0.004	0.004
205-99-2	Benzo(b)fluoranthene	0.0002	0.001	0.001	0.0002	0.004	0.004
207-08-9	Benzo(k)fluoranthene	Bkg/DL	0.01	0.01	Bkg/DL	0.04	0.04
50-32-8	Benzo(a)pyrene	0.0002	0.0001	0.0002	0.0002	0.0004	0.0004
218-01-9	Chrysene	0.0002	0.12	0.12	0.0002	0.39	0.39
53-70-3	Dibenzo(a,h)anthracene	0.0003	0.0001	0.0003	0.0003	0.0004	0.0004
193-39-5	Indeno(1,2,3-cd)pyrene	0.0004	0.001	0.001	0.0004	0.004	0.004
Inorganic chemicals							
7440-36-0	Antimony	0.006	0.006	0.006	0.006	0.04	0.04
7440-38-2	Arsenic	0.01	0.0006	0.01	0.01	0.002	0.01
7440-39-3	Barium	2	3.1	3.1	2	20	20
7440-41-7	Beryllium	0.004	0.03	0.03	0.004	0.2	0.2
7440-43-9	Cadmium (water)	0.005	0.008	0.008	0.005	0.05	0.05
7440-43-9	Cadmium (food or soil)	0.005	0.000006	0.005	0.005	0.1	0.1
	Chromium (unspeciated)	0.1	0.1	0.1	0.1	0.1	0.1
16065-83-1	Chromium (III)	0.1	23	23	0.1	153	153
18540-29-9	Chromium (VI)	0.1	0.002	0.1	0.1	0.006	0.1
7440-50-8	Copper	1.3	0.63	1.3	1.3	4.1	4.1
57-12-5	Cyanide	0.2	0.2	0.2	0.2	0.2	0.2
7439-92-1	Lead	0.015	0.015	0.015	0.015	0.015	0.015
7439-97-6	Mercury	0.002	0.0002	0.002	0.002	0.0008	0.002
7440-02-0	Nickel	0.1	0.31	0.31	0.1	2	2
7782-49-2	Selenium	0.05	0.08	0.08	0.05	0.51	0.51
7440-22-4	Silver	0.1	0.08	0.1	0.1	0.51	0.51
7440-28-0	Thallium	0.002	0.002	0.002	0.002	0.002	0.002
7440-66-6	Zinc	2	4.7	4.7	2	31	31

Table 2. Groundwater Risk Reduction Standards (mg/L)

CAS #	Constituent	Delineation Standard: Type 1 RRS	Type 2 RRS	Residential GW RRS*	Type 3 RRS	Type 4 RRS	Non-Residential RRS**
Other Chemicals							
540-54-5	1-Chloropropane (2,2'-Oxybis)	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
96-18-4	1,2,3-Trichloropropane	0.04	0.00003	0.04	0.04	0.0001	0.04
120-82-1	1,2,4-Trichlorobenzene	0.07	0.001	0.07	0.07	0.006	0.07
106-93-4	1,2-Dibromoethane (EDB)	0.00005	0.00009	0.00009	0.00005	0.0001	0.0001
95-50-1	1,2-Dichlorobenzene	0.6	0.11	0.6	0.6	0.55	0.6
78-87-5	1,2-Dichloropropane	0.005	0.002	0.005	0.005	0.007	0.007
541-73-1	1,3-Dichlorobenzene	0.6	0.6	0.6	0.6	0.6	0.6
106-46-7	1,4-Dichlorobenzene	0.075	0.006	0.075	0.075	0.007	0.075
95-95-4	2,4,5-Trichlorophenol	4	1.6	4	4	10	10
93-72-1	2,4,5-TP (Silvex)	0.05	0.13	0.13	0.05	0.82	0.82
88-06-2	2,4,6-Trichlorophenol	0.03	0.02	0.03	0.03	0.1	0.1
94-75-7	2,4-D	0.07	0.16	0.16	0.07	1	1
120-83-2	2,4-Dichlorophenol	0.02	0.05	0.05	0.02	0.31	0.31
105-67-9	2,4-Dimethylphenol	0.7	0.31	0.7	0.7	2	2
51-28-5	2,4-Dinitrophenol	0.07	0.03	0.07	0.07	0.2	0.2
121-14-2	2,4-Dinitrotoluene	0.00005	0.003	0.003	0.00005	0.009	0.009
606-20-2	2,6-Dinitrotoluene	Bkg/DL	0.02	0.02	Bkg/DL	0.1	0.1
78-93-3	2-Butanone (MEK)	2	2.3	2.3	2	12	12
91-58-7	2-Chloronaphthalene	Bkg/DL	1.3	1.3	Bkg/DL	8.2	8.2
95-57-8	2-Chlorophenol	0.04	0.08	0.08	0.04	0.51	0.51
95-48-7	2-Methylphenol	Bkg/DL	0.78	0.78	Bkg/DL	5.1	5.1
88-75-5	2-Nitrophenol	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
91-94-1	3,3'-Dichlorobenzidine	0.00008	0.002	0.002	0.00008	0.006	0.006
108-39-4	3-Methylphenol	Bkg/DL	0.78	0.78	Bkg/DL	5.1	5.1
106-44-5	4-Methylphenol	Bkg/DL	0.08	0.08	Bkg/DL	0.51	0.51
7005-72-3	4-Chlorophenyl-phenylether	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
72-54-8	4,4'-DDD	0.0001	0.004	0.004	0.0001	0.01	0.01
72-55-9	4,4'-DDE	0.0001	0.003	0.003	0.0001	0.008	0.008
50-29-3	4,4'-DDT	0.0001	0.003	0.003	0.0001	0.008	0.008
106-47-8	4-Chloroaniline	0.1	0.004	0.1	0.1	0.01	0.1
59-50-7	4-Chloro-3-methylphenol	Bkg/DL	1.6	1.6	Bkg/DL	10	10
100-02-7	4-Nitrophenol	0.06	0.06	0.06	0.06	0.06	0.06
67-64-1	Acetone	4	8	8	4	46	46
309-00-2	Aldrin	0.00002	0.00005	0.00005	0.00002	0.0002	0.0002
319-84-6	alpha-BHC	0.000006	0.0001	0.0001	0.000006	0.0005	0.0005
86-50-0	Azinphos-methyl	Bkg/DL	0.05	0.05	Bkg/DL	0.31	0.31

Table 2. Groundwater Risk Reduction Standards (mg/L)

CAS #	Constituent	Delineation Standard: Type 1 RRS	Type 2 RRS	Residential GW RRS*	Type 3 RRS	Type 4 RRS	Non-Residential RRS**
71-43-2	Benzene	0.005	0.005	0.005	0.005	0.009	0.009
319-85-7	beta-BHC (Hexachlorocyclohexane, Beta-)	0.00002	0.0005	0.0005	0.00002	0.002	0.002
111-91-1	bis(2-Chloroethoxy)methane	Bkg/DL	0.05	0.05	Bkg/DL	0.31	0.31
111-44-4	bis(2-Chloroethyl) ether	0.00003	0.0002	0.0002	0.00003	0.0002	0.0002
117-81-7	bis(2-Ethylhexyl) phthalate	0.006	0.06	0.06	0.006	0.2	0.2
74-83-9	Bromomethane	0.01	0.003	0.01	0.01	0.01	0.01
85-68-7	Butylbenzylphthalate	0.1	0.45	0.45	0.1	1.5	1.5
63-25-2	Carbaryl	0.7	1.6	1.6	0.7	10	10
75-15-0	Carbon disulfide	4	0.33	4	4	1.7	4
56-23-5	Carbon tetrachloride	0.005	0.006	0.006	0.005	0.01	0.01
57-74-9	Chlordane	0.002	0.0004	0.002	0.002	0.0007	0.002
108-90-7	Chlorobenzene	0.1	0.03	0.1	0.1	0.14	0.14
75-00-3	Chloroethane	Bkg/DL	6	6	Bkg/DL	29	29
2921-88-2	Chlorpyrifos	0.02	0.05	0.05	0.02	0.31	0.31
56-72-4	Coumaphos	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
108-94-1	Cyclohexanone	Bkg/DL	78	78	Bkg/DL	511	511
110-82-7	Cyclohexane	Bkg/DL	3.6	3.6	Bkg/DL	18	18
75-99-0	Dalapon	0.2	0.47	0.47	0.2	3.1	3.1
319-86-8	delta-BHC	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
333-41-5	Diazinon	0.0006	0.01	0.01	0.0006	0.07	0.07
124-48-1	Dibromochloromethane	0.1	0.02	0.1	0.1	0.03	0.1
1918-00-9	Dicamba	0.2	0.47	0.47	0.2	3.1	3.1
75-09-2	Dichloromethane (Methylene chloride)	0.005	0.06	0.06	0.005	0.12	0.12
60-57-1	Dieldrin	0.00002	0.00005	0.00005	0.00002	0.0002	0.0002
84-66-2	Diethylphthalate	5	13	13	5	82	82
60-51-5	Dimethoate	0.007	0.003	0.007	0.007	0.02	0.02
131-11-3	Dimethylphthalate	400	400	400	400	400	400
84-74-2	Di-n-butylphthalate	4	1.6	4	4	10	10
117-84-0	Di-n-octylphthalate	0.7	0.7	0.7	0.7	0.7	0.7
88-85-7	Dinoseb (DNBP)	0.007	0.02	0.02	0.007	0.1	0.1
298-04-4	Disulfoton	0.0003	0.0006	0.0006	0.0003	0.004	0.004
115-29-7	Endosulfan I	0.002	0.09	0.09	0.002	0.61	0.61
33213-65-9	Endosulfan II	0.002	0.002	0.002	0.002	0.002	0.002
1031-07-8	Endosulfan sulfate	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
72-20-8	Endrin	0.002	0.005	0.005	0.002	0.03	0.03
7421-93-4	Endrin aldehyde	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
2104-64-5	EPN	Bkg/DL	0.0002	0.0002	Bkg/DL	0.001	0.001

Table 2. Groundwater Risk Reduction Standards (mg/L)

CAS #	Constituent	Delineation Standard: Type 1 RRS	Type 2 RRS	Residential GW RRS*	Type 3 RRS	Type 4 RRS	Non-Residential RRS**
100-41-4	Ethyl benzene	0.7	0.02	0.7	0.7	0.03	0.7
115-90-2	Fensulfothion	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
58-89-9	gamma-BHC (Lindane)	0.0002	0.0008	0.0008	0.0002	0.003	0.003
76-44-8	Heptachlor	0.0004	0.0002	0.0004	0.0004	0.0006	0.0006
1024-57-3	Heptachlor epoxide	0.0002	0.00009	0.0002	0.0002	0.0003	0.0003
118-74-1	Hexachlorobenzene	0.001	0.0005	0.001	0.001	0.002	0.002
87-68-3	Hexachlorobutadiene	0.001	0.02	0.02	0.001	0.1	0.1
77-47-4	Hexachlorocyclopentadiene	0.05	0.09	0.09	0.05	0.61	0.61
67-72-1	Hexachloroethane	0.001	0.02	0.02	0.001	0.1	0.1
78-59-1	Isophorone	0.1	0.9	0.9	0.1	3	3
98-82-8	Isopropylbenzene (cumene)	Bkg/DL	0.21	0.21	Bkg/DL	1	1
121-75-5	Malathion	0.2	0.31	0.31	0.2	2	2
72-43-5	Methoxychlor	0.04	0.08	0.08	0.04	0.51	0.51
298-00-0	Methyl parathion	0.002	0.004	0.004	0.002	0.03	0.03
7786-34-7	Mevinphos	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL	Bkg/DL
98-95-3	Nitrobenzene	0.02	0.002	0.02	0.02	0.002	0.02
56-38-2	Parathion	0.2	0.09	0.2	0.2	0.61	0.61
87-86-5	Pentachlorophenol	0.001	0.007	0.007	0.001	0.02	0.02
108-95-2	Phenol	4	4.7	4.7	4	31	31
100-42-5	Styrene	0.1	0.5	0.5	0.1	2.6	2.6
127-18-4	Tetrachloroethene	0.005	0.001	0.005	0.005	0.004	0.005
108-88-3	Toluene	1	0.88	1	1	5.2	5.2
8001-35-2	Toxaphene	0.003	0.0008	0.003	0.003	0.003	0.003
79-01-6	Trichloroethene	0.005	0.03	0.03	0.005	0.04	0.04
95-47-6	o-Xylene	Bkg/DL	0.37	0.37	Bkg/DL	1.9	1.9

* Higher of Type 1 and Type 2 RRS

** Higher of Type 3 and Type 4 RRS

Table 3. Summary Comparison of Surface Soil Results to RRSs (mg/kg)

CAS #	Constituent	Maximum Concentration (ppm)	Residential SS RRS	Non-Residential SS RRS	Frequency of Exceedance (Res)	Frequency of Exceedance (Non-Res)	Average Magnitude of Res Exceedance	
Inorganics								
7440-38-2	Arsenic	58	20	38	5/230	5/230	0.27	
7440-39-3	Barium	327	2554	16480	0/64	0/64		
7440-41-7	Beryllium	1.5	156	3161	0/39	0/39		
7440-43-9	Cadmium	47	7.5	150	1/64	0/64	3.2	
7440-47-3	Chromium	Chromium (III)	97	100000	100000	0/64	0/64	
7440-47-3		Chromium (unspeciated)	97	100	1200	0/64	0/64	
7440-47-3		Chromium (VI)	97	100	109	0/64	0/64	
7440-50-8	Copper	18100	915	2886	3/121	2/121	0.25	
7439-92-1	Lead	61	270	400	0/64	0/64		
7439-97-6	Mercury	0.220	2.1	17	0/64	0/64		
744-00-2	Nickel	21	404	2608	0/39	0/39		
7782-49-2	Selenium	42	8.3	52	1/64	1/64	5.1	
7440-22-4	Silver	4.7	17	85	0/64	0/64		
7440-66-6	Zinc	240	5847	38564	0/104	0/104		
Organics								
120-82-1	1,2,4-Trichlorobenzene	0.0050	10.83	10.83	0/190	0/190		
106-93-4	1,2-Dibromoethane	0.0020	0.01	0.01	0/133	0/133		
95-50-1	1,2-Dichlorobenzene	0.0046	60	60	0/172	0/172		
106-46-7	1,4-Dichlorobenzene	0.17	7.5	7.5	0/172	0/172		
93-72-1	2,4,5-TC (Silvex)	0.0069	10	10	0/119	0/119		
78-93-3	2-Butanone (MEK)	0.090	200	200	0/134	0/134		
72-54-8	4,4'-DDD	190	19	47	12/258	7/258	0.65	
72-55-9	4,4'-DDE	31	14	38	4/251	0/251	0.10	
50-29-3	4,4'-DDT	660	20	54	11/258	5/258	0.98	
100-02-7	4-Nitrophenol	70	6	6	1/109	1/109	12	
67-64-1	Acetone	0.99	400	400	0/134	0/134		
309-00-2	Aldrin	14	0.66	0.66	1/158	1/158	4.4	
319-84-6	alpha-BHC	3.3	0.66	0.66	2/158	2/158	1.6	
86-50-0	Azinphos-methyl	0.025	10	10	0/131	0/131		

Table 3. Summary Comparison of Surface Soil Results to RRSs (mg/kg)

CAS #	Constituent	Maximum Concentration (ppm)	Residential SS RRS	Non-Residential SS RRS	Frequency of Exceedance (Res)	Frequency of Exceedance (Non-Res)	Average Magnitude of Res Exceedance
71-43-2	Benzene	45	0.5	0.5	1/134	1/134	13
56-55-3	Benzo(a)anthracene	0.037	7.1	28	0/102	0/102	
50-32-8	Benzo(a)pyrene	0.36	1.6	7.8	0/102	0/102	
205-99-2	Benzo(b)fluoranthene	6.3	12	78	0/102	0/102	
191-24-2	Benzo(g,h,i)perylene	0.043	500	500	0/102	0/102	
207-08-9	Benzo(k)fluoranthene	0.081	125	784	0/102	0/102	
319-85-7	beta-BHC	0.051	0.66	0.66	0/162	0/162	
117-81-7	bis(2-Ethylhexyl) phthalate	6.1	287	957	0/102	0/102	
63-25-2	Carbaryl	36	70	182	0/24	0/24	
75-15-0	Carbon disulfide	0.369	400	400	0/71	0/71	
57-74-9	Chlordane	450	9.2	9.2	7/200	7/200	2.2
108-90-7	Chlorobenzene	61	10	10	1/134	1/134	0.87
2921-88-2	Chlorpyrifos	690.0	15	94	1/113	1/113	2.9
218-01-9	Chrysene	0.35	867	2817	0/102	0/102	
56-72-4	Coumaphos	0.0064	1	1	0/131	0/131	
108-94-1	Cyclohexanone	29	359	2351	0/26	0/26	
75-99-0	Dalapon	0.092	20	20	0/111	0/111	
333-41-5	Diazinon	2	1.3	8.8	1/103	0/103	0.38
53-70-3	Dibenzo(a,h)anthracene	0.031	2	7.8	0/102	0/102	
1918-00-9	Dicamba	0.0026	20	20	0/110	0/110	
60-57-1	Dieldrin	21	0.66	0.66	1/158	1/158	11
60-51-5	Dimethoate	8.0	0.7	0.7	5/127	5/127	1.69
298-04-4	Disulfoton	2	0.03	0.15	2/102	2/102	36
959-98-8	Endosulfan I	160	26	170	7/165	0/165	0.62
33213-65-9	Endosulfan II	170	10	10	8/165	8/165	1.3
1031-07-8	Endosulfan sulfate	79	1.65	1.65	6/165	6/165	5.3
72-20-8	Endrin	140	10	24	1/158	1/158	1.56
	Endrin Aldehyde	61	10	10	1/158	1/158	1.5
2104-64-5	EPN	0.19	6.4	20	0/131	0/131	
100-41-4	Ethyl benzene	170	70	70	2/134	2/134	0.32
115-90-2	Fensulfothion	1.000	10	10	0/131	0/131	

Table 3. Summary Comparison of Surface Soil Results to RRSs (mg/kg)

CAS #	Constituent	Maximum Concentration (ppm)	Residential SS RRS	Non-Residential SS RRS	Frequency of Exceedance (Res)	Frequency of Exceedance (Non-Res)	Average Magnitude of Res Exceedance
206-44-0	Fluoranthene	0.059	2224	9118	0/102	0/102	
59-89-9	gamma-BHC (Lindane)	2.7	0.66	0.66	2/158	2/158	0.65
76-44-8	Heptachlor	60	0.67	0.83	3/258	3/258	13
1024-57-3	Heptachlor epoxide	0.22	1.6	1.65	0/158	0/158	
193-39-5	Indeno(1,2,3-cd)pyrene	0.33	12	78	0/102	0/102	
98-82-8	Isopropylbenzene	81	22	33	1/133	1/133	0.31
121-75-5	Malathion	0.082	20	20	0/131	0/131	
72-43-5	Methoxychlor	0.42	87	542	0/149	0/149	
7786-34-7	Mevinphos	0.017	10	10	0/102	0/102	
91-20-3	Naphthalene	8.6	100	100	0/129	0/129	
95-47-6	o-Xylene	400	20	38	2/70	1/70	1.7
56-38-2	Parathion	0.17	20	60	0/131	0/131	
87-86-5	Pentachlorophenol	0.0096	3.3	4	0/137	0/137	
85-01-8	Phenanthrene	0.041	110	110	0/102	0/102	
129-00-0	Pyrene	0.43	2184	6770	0/102	0/102	
127-18-4	Tetrachloroethene	0.084	0.5	0.5	0/134	0/134	
108-88-3	Toluene	0.15	100	100	0/134	0/134	
8001-35-2	Toxaphene	5600	10.88	10.88	13/249	13/249	22
79-01-6	Trichloroethene	0.0086	0.5	0.5	0/134	0/134	

ND: not detected

Nonresidential RRS: Higher of Type 3 and Type 4

 Maximum concentration exceeds Non-Residential RRS

 Maximum concentration exceeds Residential RRS

Frequency of exceedance: Number of results above RRS / Number of results

Average magnitude of exceedance: Average detected concentration divided by the Residential RRS

Table 4. Summary Comparison of Subsurface Soil Results to RRSs (mg/kg)

CAS #	Constituent	Maximum Concentration (ppm)	Residential SS RRS	Non-Residential SB RRS	Frequency of Exceedance (Res)	Frequency of Exceedance (Non-Res)	Average Magnitude of Res Exceedance	
Inorganics								
7440-36-0	Antimony	5.1	5.4	36	0/110	0/110		
7440-38-2	Arsenic	219	20	41	2/352	2/352	0.23	
7440-39-3	Barium	74	2554	16480	0/127	0/127		
7440-41-7	Beryllium	2.6	156	3161	0/110	0/110		
7440-43-9	Cadmium	96	7.5	150	0/127	0/127	2.8	
7440-47-3	Chromium	Chromium (III)	95	100000	100000	0/127	0/127	
7440-47-3		Chromium (unspeciated)	95	100	1200	0/127	0/127	
7440-47-3		Chromium (VI)	95	100	1200	0/127	0/127	
7440-50-8	Copper	14400	915	2886	1/235	1/235	0.09	
7439-92-1	Lead	65	270	400	0/127	0/127		
7439-97-6	Mercury	0.25	2.1	17	0/131	0/131		
744-00-2	Nickel	14.4	404	2608	0/110	0/110		
7440-22-4	Silver	0.2	17	85	0/127	0/127		
7440-28-0	Thallium	5.1	2.8	10	3/110	0/110		
7440-66-6	Zinc	6720	5847	38564	1/234	0/234	0.01	
Organics								
96-18-4	1,2,3-Trichloropropane	16	0.5	4	1/222	1/222	32	
120-82-1	1,2,4-Trichlorobenzene	0.2	10.83	10.83	0/393	0/393		
96-12-8	1,2-Dibromoethane	2.7	0.01	0.01	25/284	25/284	40	
95-50-1	1,2-Dichloropropane	0.075	0.5	0.5	0/267	0/267		
78-87-5	1,4-Dichlorobenzene	2.8	7.5	7.5	0/346	0/346		
106-46-7	2,4,5-TC (Silvex)	0.002	10	10	0/241	0/241		
93-72-1	2,4-D	0.025	7	7	0/241	0/241		
94-75-7	2,4-Dimethylphenol	0.13	70	70	0/217	0/217		
105-67-9	2-Butanone (MEK)	3.1	200	200	0/266	0/266		
78-93-3	3/4-Methylphenol	0.069	13	82	0/82	0/82		
	4,4'-DDD	140	19	47	8/440	3/440	0.30	
72-54-8	4,4'-DDE	17	14	38	2/411	0/411	0.06	
72-55-9	4,4'-DDT	340	20	54	15/451	11/451	0.69	
50-29-3	4-Nitrophenol	5.7	6	6	0/218	0/218		
83-32-9	Acenaphthylene	0.022	130	130	0/217	0/217		
208-96-8	Acetone	0.6	400	400	0/265	0/265		
67-64-1	Aldrin	7.6	0.66	0.66	1/308	1/308	2.5	
309-00-2	alpha-BHC	2.2	0.66	0.66	1/309	1/309	0.43	
120-12-7	Benzene	0.01	0.5	0.5	0/267	0/267		

Table 4. Summary Comparison of Subsurface Soil Results to RRSs (mg/kg)

CAS #	Constituent	Maximum Concentration (ppm)	Residential SS RRS	Non-Residential SB RRS	Frequency of Exceedance (Res)	Frequency of Exceedance (Non-Res)	Average Magnitude of Res Exceedance
71-43-2	Benzo(a)anthracene	0.14	7.1	28	0/217	0/217	
56-55-3	Benzo(a)pyrene	0.15	1.6	9.4	0/217	0/217	
50-32-8	Benzo(b)fluoranthene	0.59	12	96	0/217	0/217	
205-99-2	Benzo(g,h,i)perylene	0.096	500	500	0/217	0/217	
191-24-2	Benzo(k)fluoranthene	0.18	125	940	0/217	0/217	
207-08-9	beta-BHC	3	0.66	0.66	1/314	1/314	0.55
319-85-7	bis(2-Ethylhexyl) phthalate	2.5	287	957	0/217	0/217	
117-81-7	Bromomethane	0.0062	1	1	0/267	0/267	
74-83-9	Carbaryl	3.8	70	182	0/26	0/26	
63-25-2	Carbon disulfide	0.01	400	400	0/141	0/141	
75-15-0	Chlordane	640	9.2	9.2	18/367	18/367	4.9
57-74-9	Chlorobenzene	0.094	10	10	0/267	0/267	
108-90-7	Chloroethane	0.98	34	163	0/267	0/267	
75-00-3	Chlorpyrifos	0.71	15	94	0/153	0/153	
2921-88-2	Chrysene	0.16	867	2817	0/217	0/217	
218-01-9	cis-1,2-Dichloroethene	0.0022	782	0.53	0/253	0/253	
156-59-2	Coumaphos	4.5	1	1	1/240	1/240	2.3
56-72-4	Cyclohexanone	47	359	2351	0/38	0/38	
108-94-1	Dalapon	0.11	20	20	0/241	0/241	
75-99-0	Diazinon	0.016	1.3	8.8	0/158	0/158	
333-41-5	Dibenzo(a,h)anthracene	0.032	2	31	0/217	0/217	
1918-00-9	Dichloromethane (Methylene chloride)	0.26	0.5	0.6	0/267	0/267	
75-09-2	Dieldrin	25	0.66	0.66	5/307	5/307	8.5
60-57-1	Dimethoate	0.80	0.7	0.7	1/240	1/240	0.16
60-51-5	Di-n-butylphthalate	11	400	500	0/217	0/217	
84-74-2	Di-n-octylphthalate	0.10	5491	5491	0/217	0/217	
117-84-0	Dinoseb (DNBP)	0.055	3.5	18	0/241	0/241	
88-85-7	Disulfoton	8.6	0.03	0.15	7/161	5/161	72
298-04-4	Endosulfan I	91	26	170	2/338	0/338	0.12
959-98-8	Endosulfan II	92	10	10	2/338	2/338	0.35
33213-65-9	Endosulfan sulfate	34	1.65	1.65	1/338	1/338	1.6
1031-07-8	Endrin	62	10	24	1/309	1/309	0.70
72-20-8	Endrin Aldehyde	31	10	10	1/309	1/309	1.0
	EPN	0.1	6.4	6.4	0/240	0/240	
2104-64-5	Ethyl benzene	1500	70	70	11/267	11/267	1.4

Table 4. Summary Comparison of Subsurface Soil Results to RRSs (mg/kg)

CAS #	Constituent	Maximum Concentration (ppm)	Residential SS RRS	Non-Residential SB RRS	Frequency of Exceedance (Res)	Frequency of Exceedance (Non-Res)	Average Magnitude of Res Exceedance
100-41-4	Fensulfothion	0.034	10	10	0/240	0/240	
115-90-2	Fluoranthene	0.5	2224	9118	0/217	0/217	
86-73-7	gamma-BHC (Lindane)	1	0.66	0.66	0/305	0/305	
59-89-9	Heptachlor	16	0.67	0.83	8/436	6/436	2.3
76-44-8	Heptachlor epoxide	0.0042	1.6	1.65	0/309	0/309	
1024-57-3	Indeno(1,2,3-cd)pyrene	0.098	12	312	0/217	0/217	
193-39-5	Isopropylbenzene	96	22	33	3/255	3/255	0.57
98-82-8	Malathion	470	20	20	5/240	5/240	1.9
121-75-5	Methoxychlor	0.1	87	542	0/309	0/309	
72-43-5	Methyl parathion	160	0.2	1	9/241	6/241	142
298-00-0	Mevinphos	17	10	10	1/158	1/158	1.7
7786-34-7	Naphthalene	2.7	100	100	0/266	0/266	
91-20-3	Nitrobenzene	4.4	2	2	1/217	1/217	2.2
98-95-3	o-Xylene	1800	20	38	18/145	15/145	7.1
95-47-6	Parathion	260	20	60	2/240	1/240	0.88
56-38-2	Pentachlorophenol	98	3.3	4	1/302	1/302	7.4
87-86-5	Phenanthrene	0.43	110	110	0/217	0/217	
85-01-8	Pyrene	0.4	2184	6770	0/217	0/217	
129-00-0	Styrene	20	14	57	1/267	0/267	0.71
100-42-5	Tetrachloroethene	0.0067	0.5	0.5	0/267	0/267	
127-18-4	Toluene	22	100	100	0/267	0/267	
108-88-3	Toxaphene	3100	10.88	10.88	34/441	34/441	15
8001-35-2	Trichloroethene	0.011	0.5	0.5	0/267	0/267	

Nonresident Maximum concentration exceeds Non-Residential RRS

Maximum concentration exceeds Residential RRS

No RRS calculated, notification criterion shown

*

Frequency of exceedance: Number of results above RRS / Number of results

Average magnitude of exceedance: Average detected concentration divided by the RRS

Table 5. Summary Comparison of Groundwater Results to RRSs (mg/L)

Constituent	Maximum Concentration*	Residential RRS	Residential Frequency of Exceedance	Non-Residential RRS	Non-Residential Frequency of Exceedance
Inorganics					
Antimony	0.000178	0.006	0/42	0.04	0/42
Arsenic	0.0060	0.01	0/42	0.01	0/42
Barium	0.23	3.1	0/42	20	0/42
Beryllium	0.00397	0.03	0/42	0.2	0/42
Cadmium	0.0017	0.008	0/42	0.05	0/42
Chromium	Chromium (III)	23	0/42	153	0/42
	Chromium (unspeciated)	0.144	0.1	0.1	1/42
	Chromium (VI)	0.144	0.1	0.1	1/42
Copper	0.014	1.3	0/42	4.1	0/42
Lead	0.0155	0.015	1/42	0.015	1/42
Mercury	0.000050	0.002	0/16	0.002	0/16
Nickel	0.094	0.31	0/42	2	0/42
Selenium	0.024	0.08	0/42	0.51	0/42
Silver	0.004040	0.1	0/42	0.51	0/42
Thallium	0.00031	0.002	0/42	0.002	0/42
Zinc	0.44	4.7	0/42	31	0/42
Organics					
1,2-Dibromo-3-chloropropane	0.00017	0.002**	0/42		0/42
1,2-Dibromoethane (EDB)	0.0014000	0.00009	17/48	0.0001	16/48
1,2-Dichloroethane	0.00053	0.005**	0/42		0/42
1,2-Dichloropropane	0.000350	0.005	0/42	0.007	0/42
1,4-Dichlorobenzene	6E-05	0.075	0/42	0.075	0/42
Benzene	0.00051	0.005	0/42	0.009	0/42
bis(2-Ethylhexyl) phthalate	0.0074	0.06	0/42	0.2	0/42
Carbon tetrachloride	0.00055	0.006	0/42	0.01	0/42
Dimethoate	1.3E-05	0.007	0/42	0.02	0/42
Dinoseb (DNBP)	0.0037	0.02	0/42	0.1	0/42
Endrin	4.6E-06	0.005	0/42	0.03	0/42
Ethyl benzene	0.00016	0.7	0/42	0.7	0/42

Table 5. Summary Comparison of Groundwater Results to RRSs (mg/L)

Constituent	Maximum Concentration*	Residential RRS	Residential Frequency of Exceedance	Non-Residential RRS	Non-Residential Frequency of Exceedance
gamma-BHC (Lindane)	9.7E-06	0.0008	0/42	0.003	0/42
Heptachlor	5.3E-07	0.0004	0/42	0.0006	0/42
Heptachlor epoxide	0.00017	0.0002	0/42	0.0003	0/42
Methoxychlor	0.00004	0.08	0/42	0.51	0/42
o-Xylene	0.00035	0.37	0/42	1.9	0/42
Toluene	0.00320	1	0/42	5.2	0/42

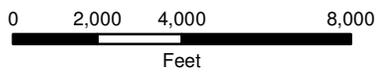
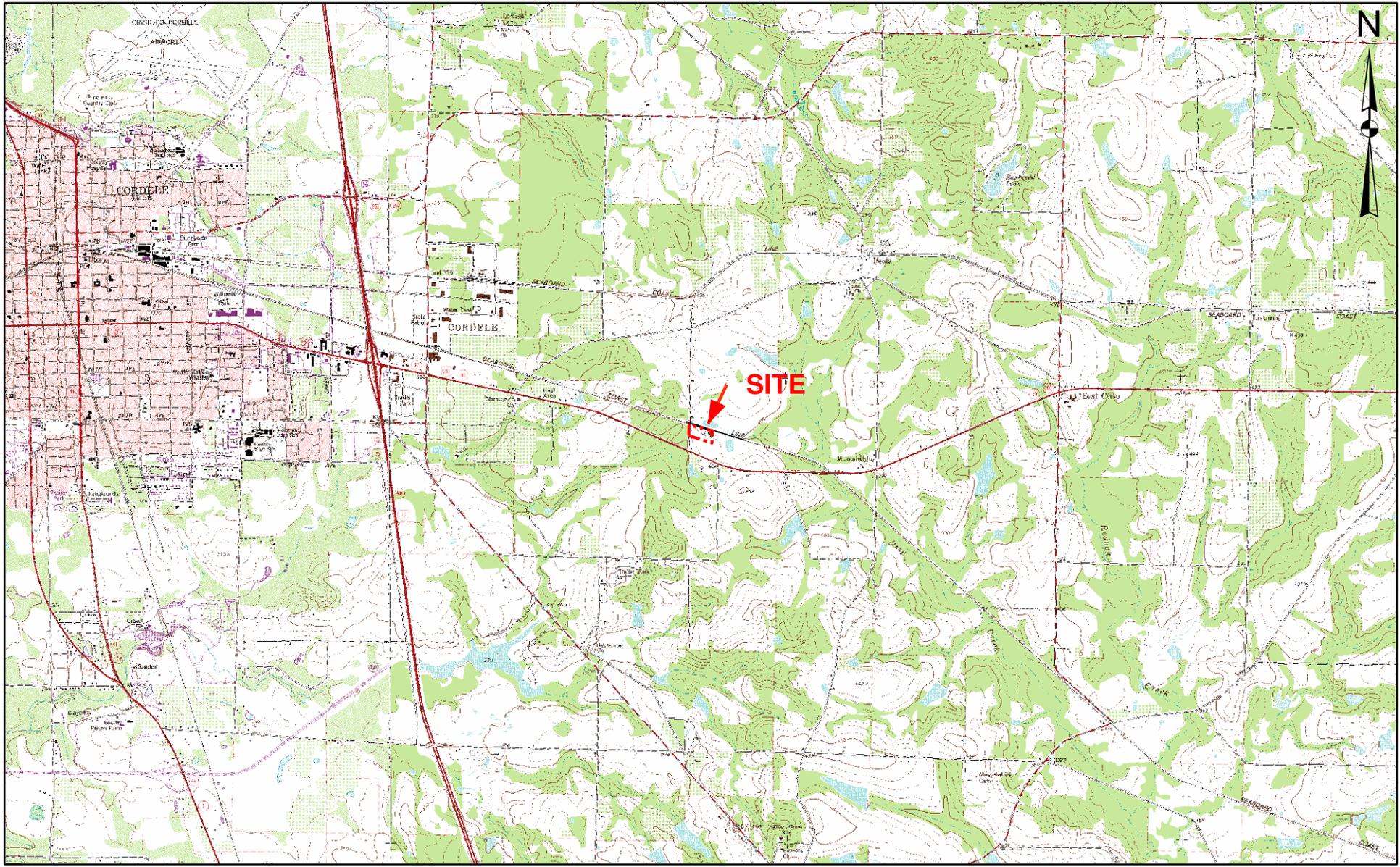
* Results from 2010-2014 used

** RRS not calculated, HSRA Table 1 Groundwater criteria value shown

Maximum concentration exceeds RRS in more than one result

St

St



Source: USGS Quad maps: Cordele, GA and Penia, GA

Site Vicinity - Topographic Map

Figure No.1



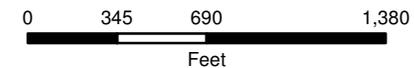
Land Cover and Use

- Agricultural
- Disturbed Ground
- Facility
- Pond
- Wooded

Legend

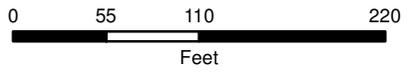
- Site Fenceline
- Railroad Lines

Aerial Photo Source: Geo Community 2007



Site Vicinity - Aerial and Land Use

Figure No.2

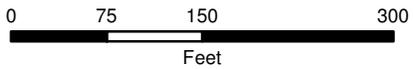
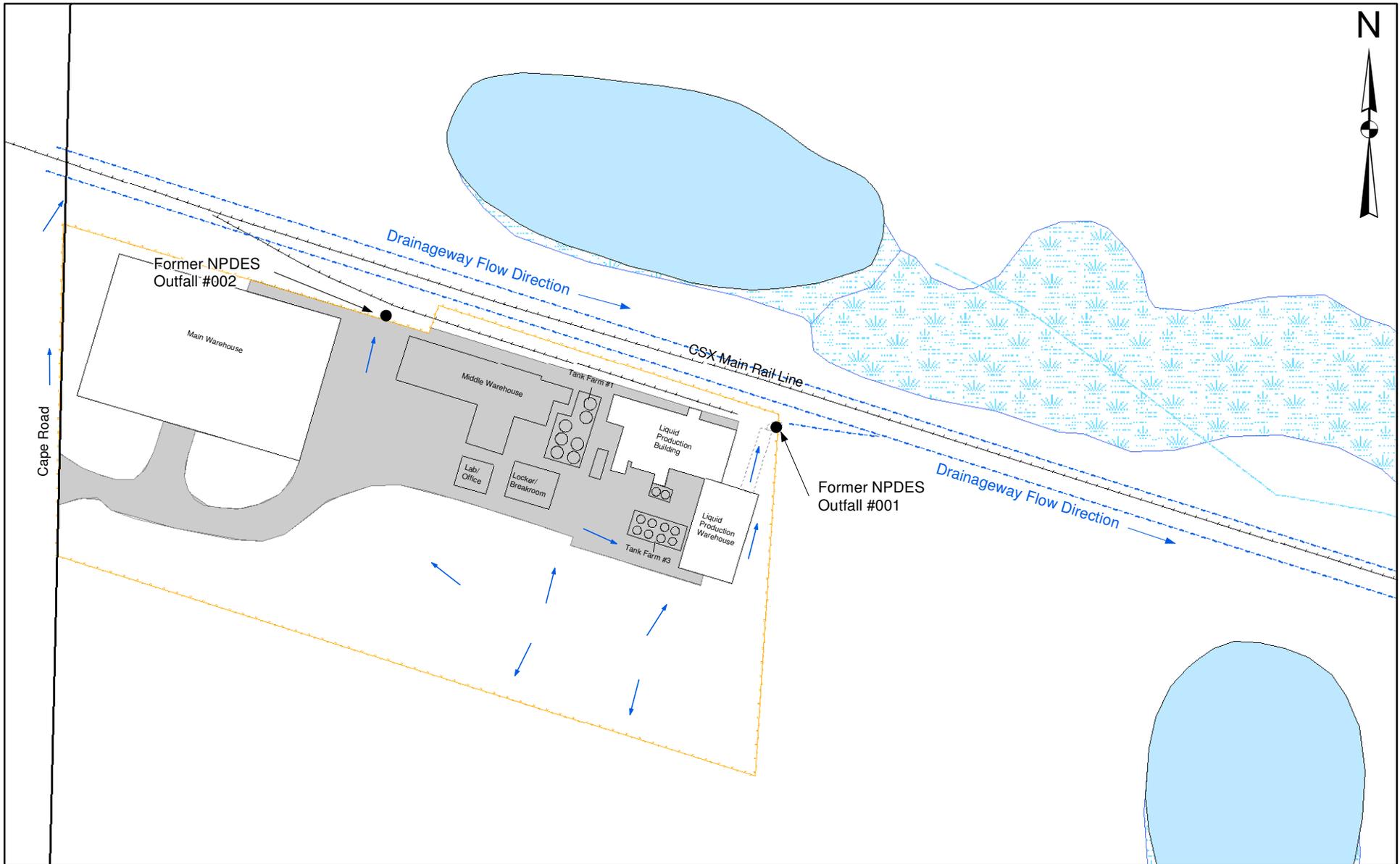


Legend

-  Former Production Wells
-  Fenceline
-  Ponds
-  Surface Impoundments
-  Buildings
-  Wetlands
-  Railroad
-  Tank Farms
-  Grass
-  Roads
-  Concrete (paved)
-  Gravel or Railroad Ballast

Facility Layout Plan

Figure No.3

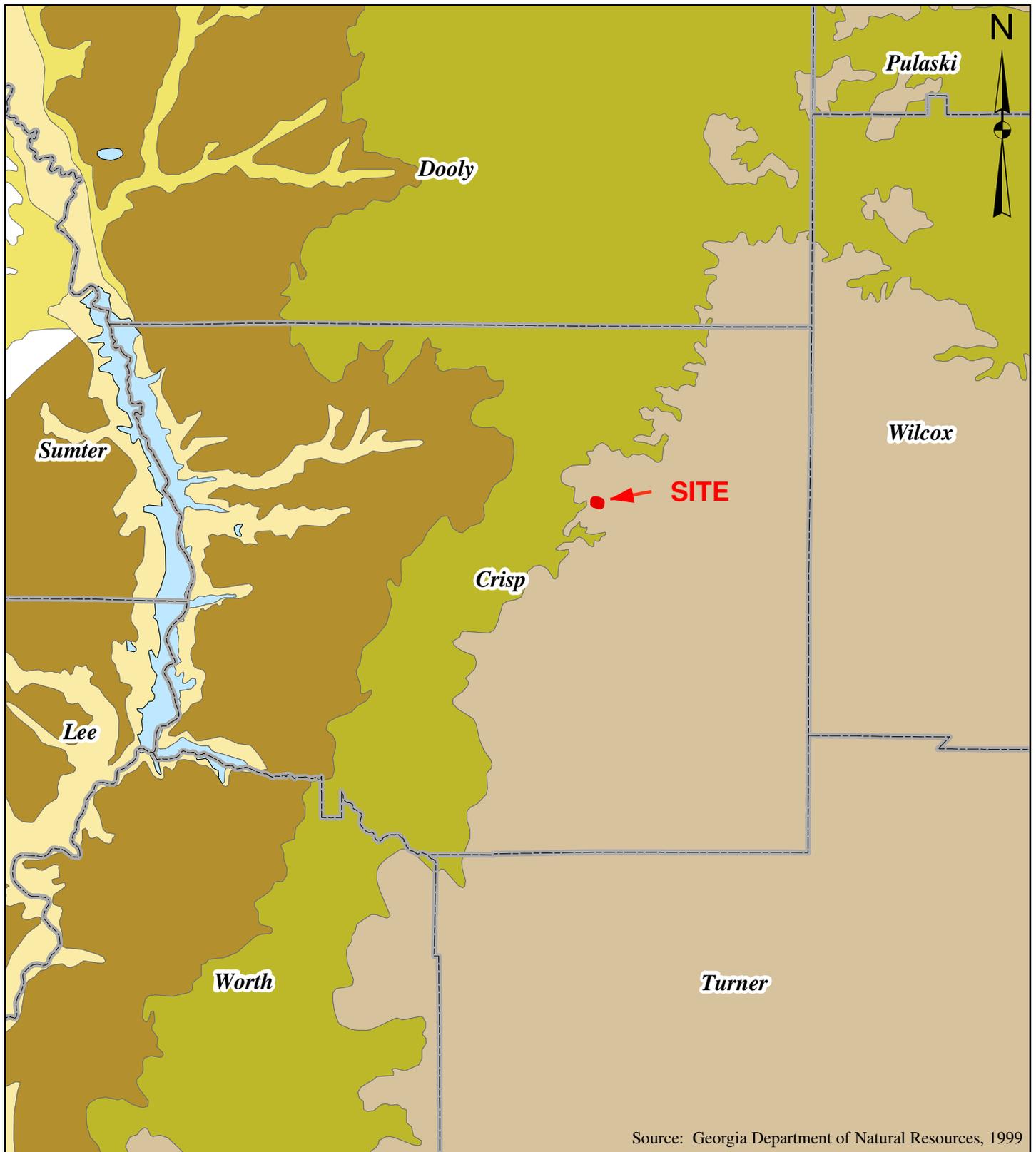


- Roads
- USGS Intermittent Streams
- Fenceline
- Railroad
- Drainage
- Pavement
- Concrete paved
- Irrigation Ponds
- Wetland Polygons

Site Drainage Features

Figure No.4

Geologic Map Drexel Cordele

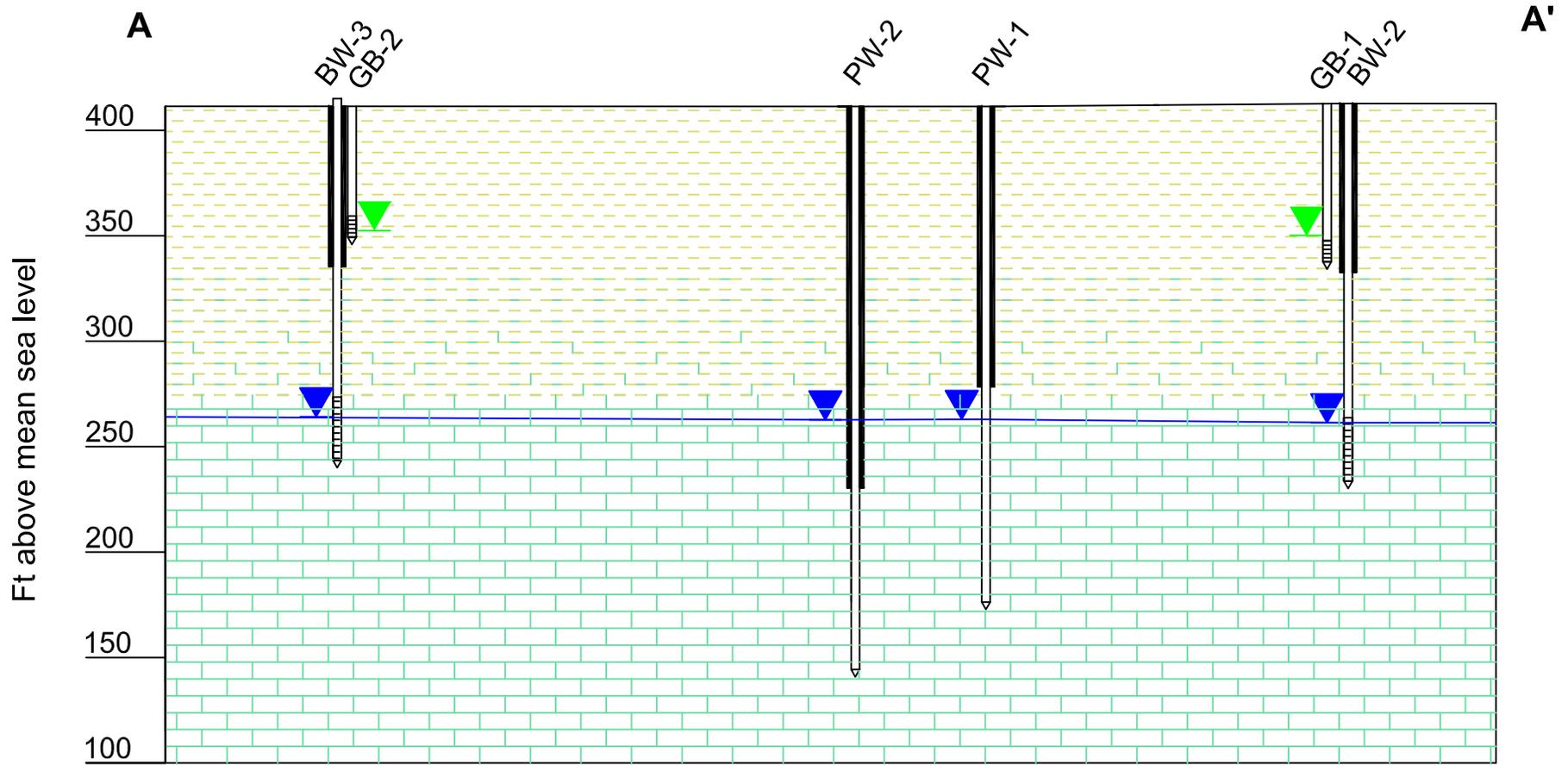


Source: Georgia Department of Natural Resources, 1999



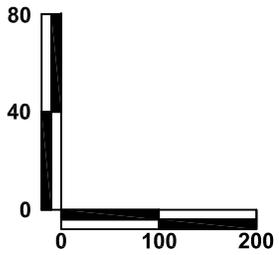
- Legend**
- Site Boundary
 - County Boundary

- Geologic Unit**
- Claiborne Undifferentiated
 - Neogene Undifferentiated (Hawthorne Formation)
 - Ocala Limestone
 - Stream Alluvium
 - Suwannee Limestone and its Residuom (Flint River Formation)
 - Water

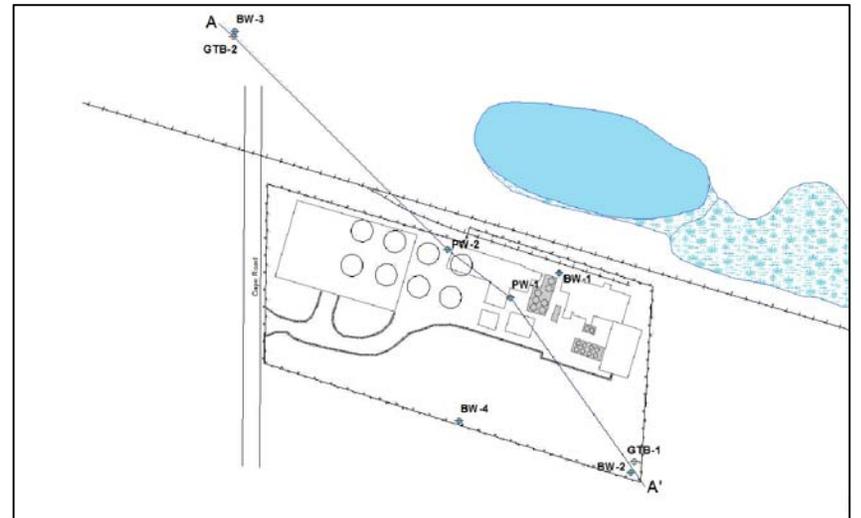


Scale

Legend

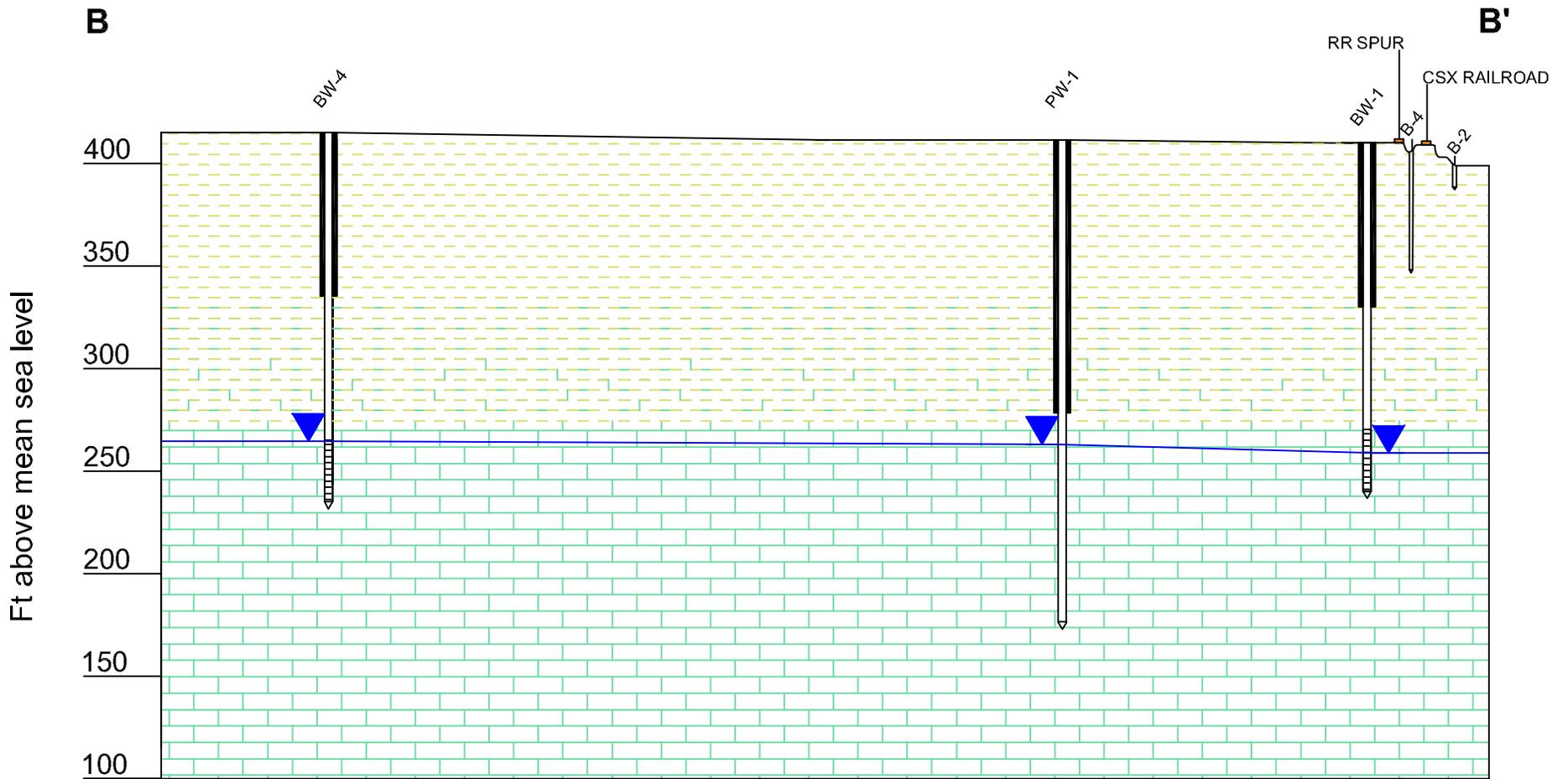


- | | | | |
|--|--------------------------------|--|--------------------|
| | Clay | | Open Hole Interval |
| | Highly Weathered Limestone | | Screened Interval |
| | Loosely Consolidated Limestone | | Outer Casing |
| | Competent Limestone | | Water Table |
| | | | Perched Water |

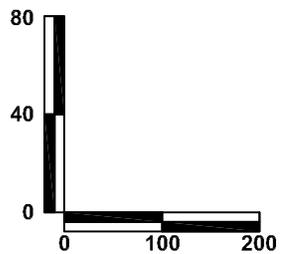


Cross-Section A-A'

Figure No. 6

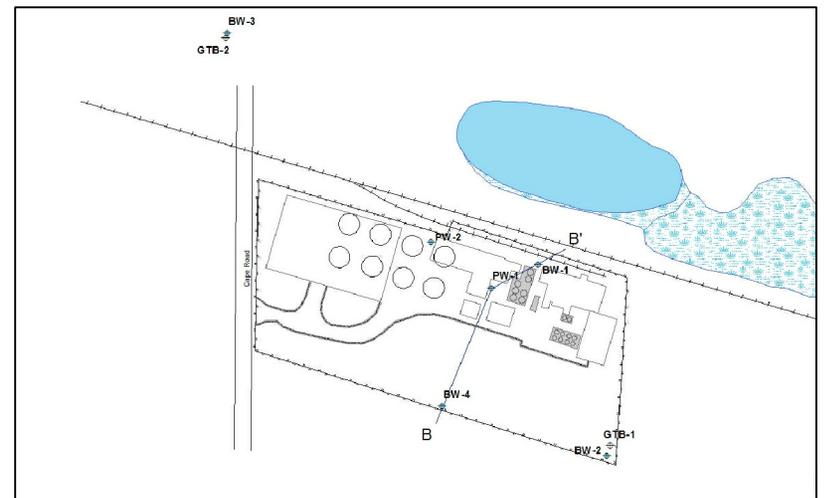


Scale



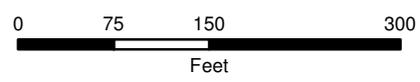
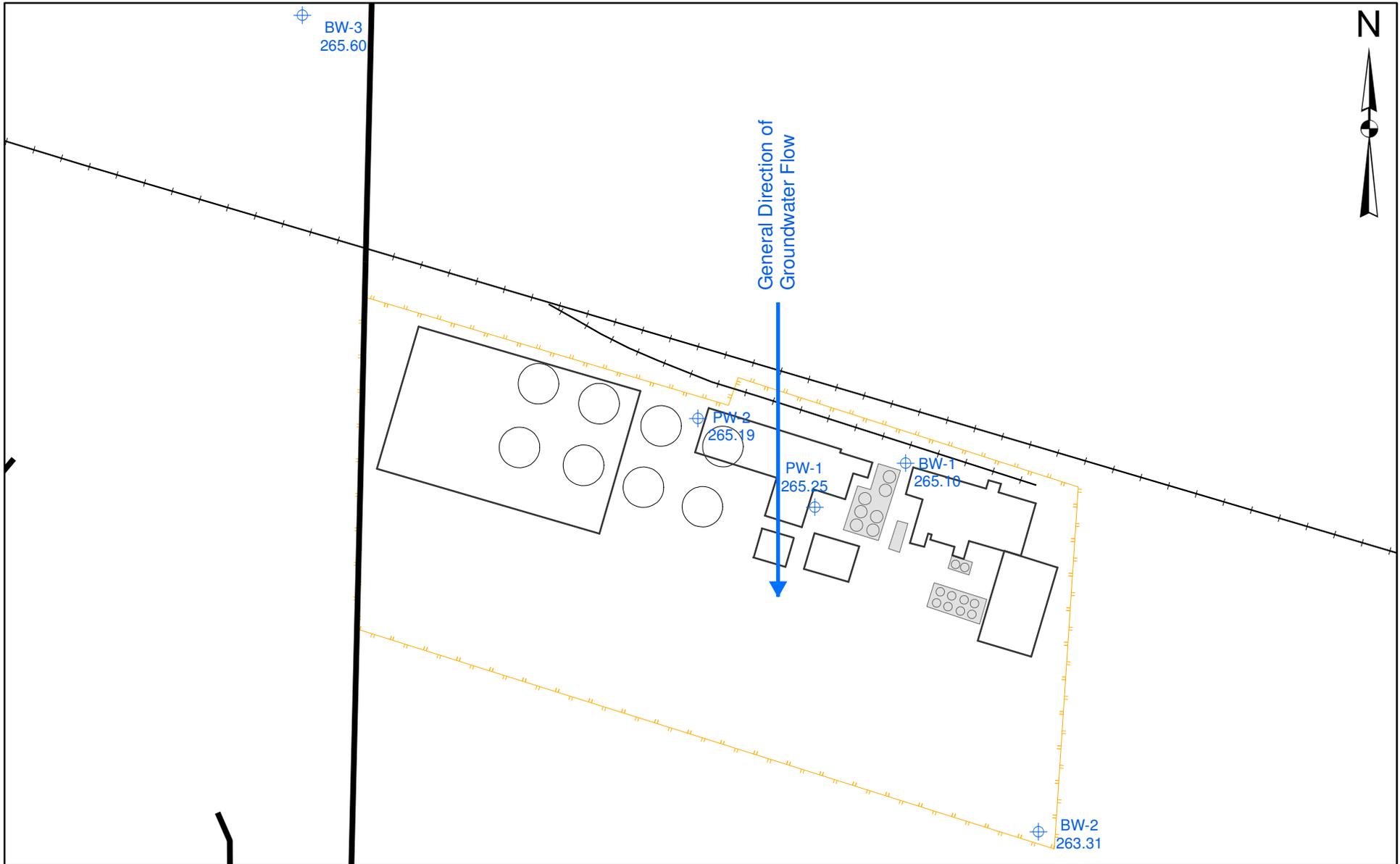
Legend

- Clay
- Highly Weathered Limestone
- Loosely Consolidated Limestone
- Competent Limestone
- Open Hole Interval
- Screened Interval
- Outer Casing
- Water Table



Cross-Section B-B'

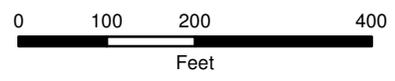
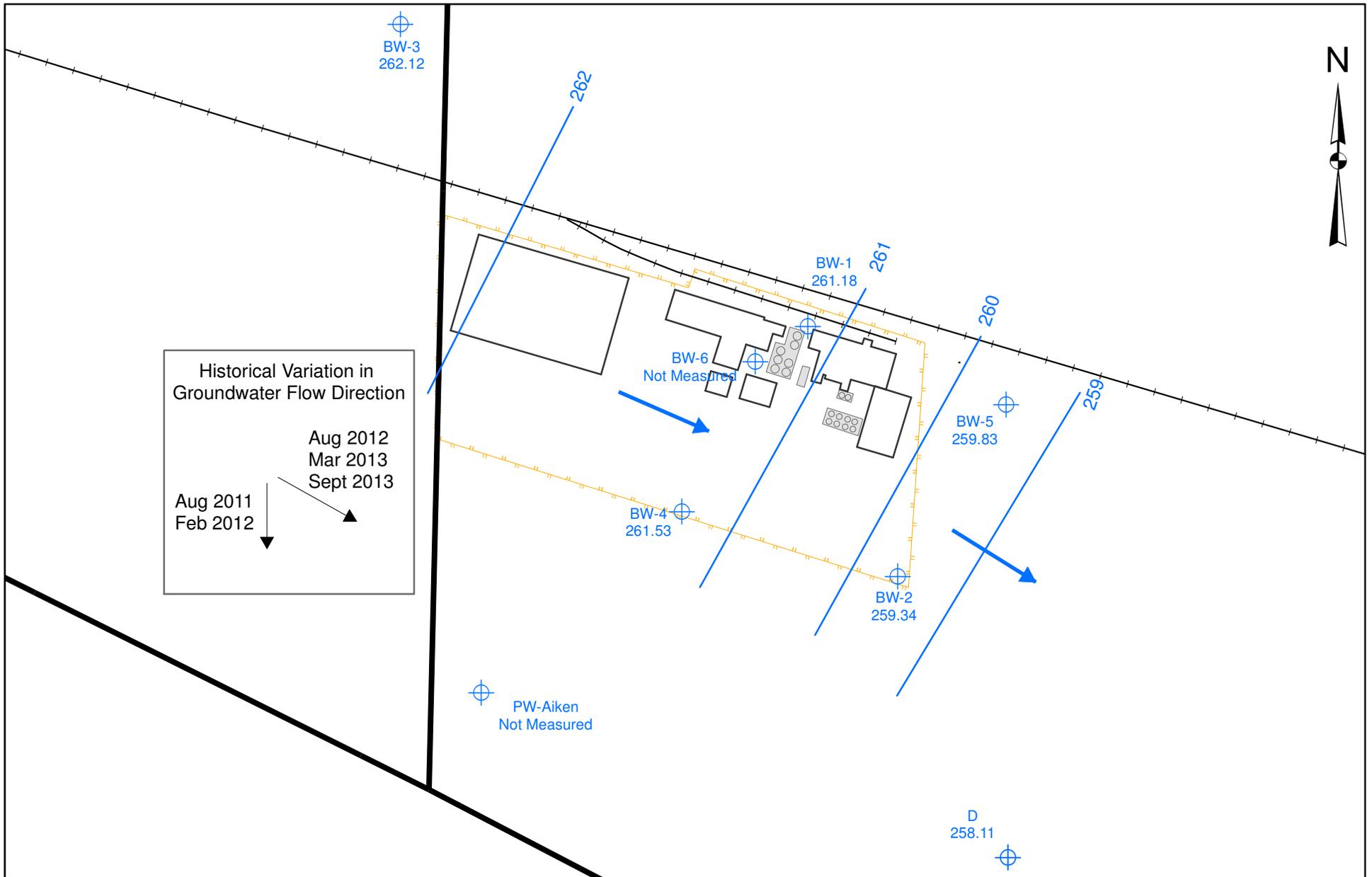
Figure No. 7



- Legend**
- Well Locations
 - General Direction of Groundwater Flow
 - Roads
 - Railroad
 - Tank Farms
 - Buildings
 - Fenceline
 - Surface Impoundments

Groundwater Elevations - November 2005

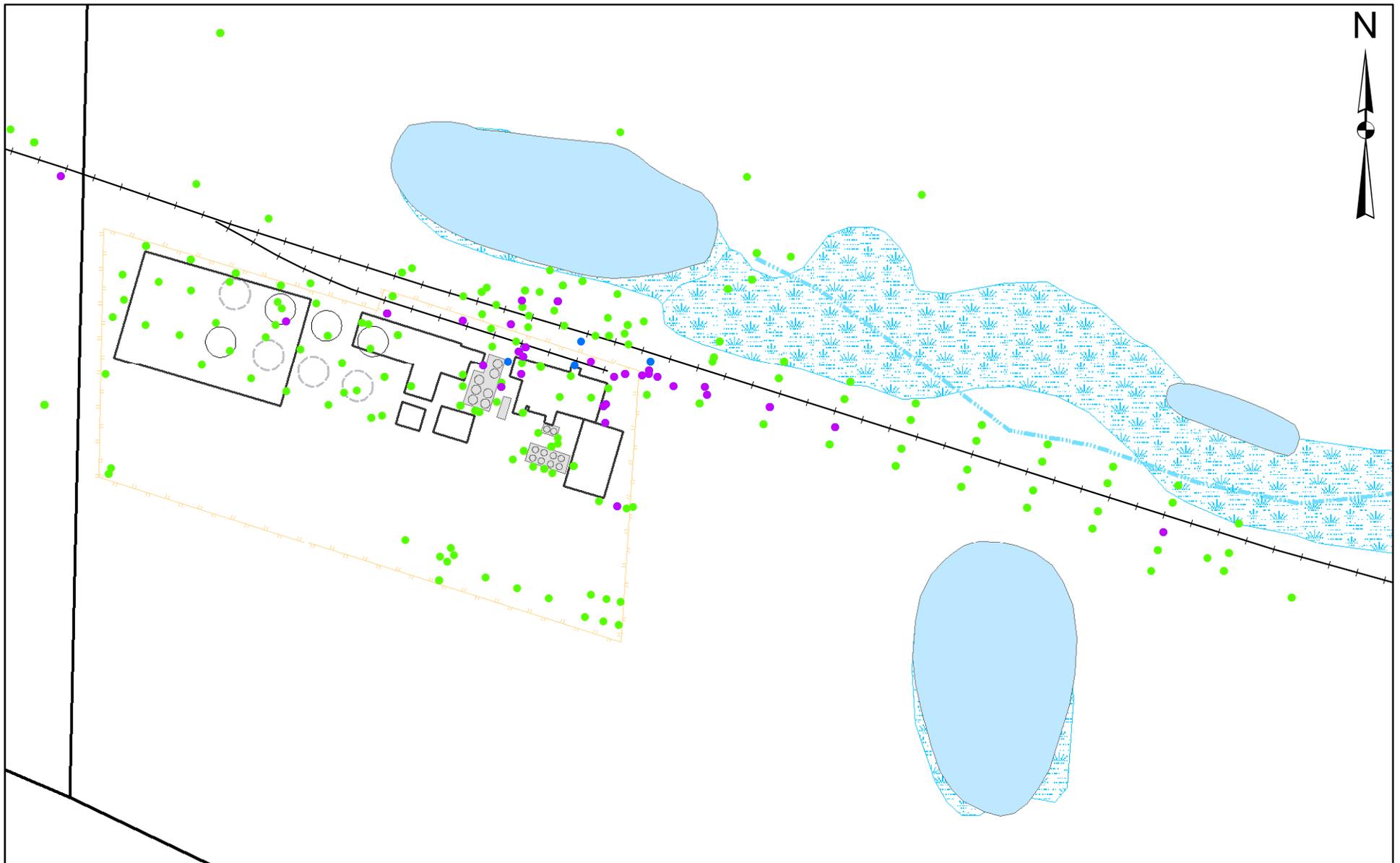
Figure No.8



- Legend**
- ⊕ Well Locations
 - ➔ Direction of Groundwater Flow
 - Groundwater Elevation (ft)
 - Railroad
 - ⊗ Tank Farms
 - Roads
 - - - Fenceline
 - Buildings

Potentiometric Surface - February 2014

Figure No. 9

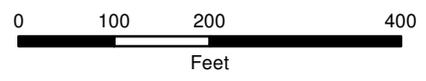
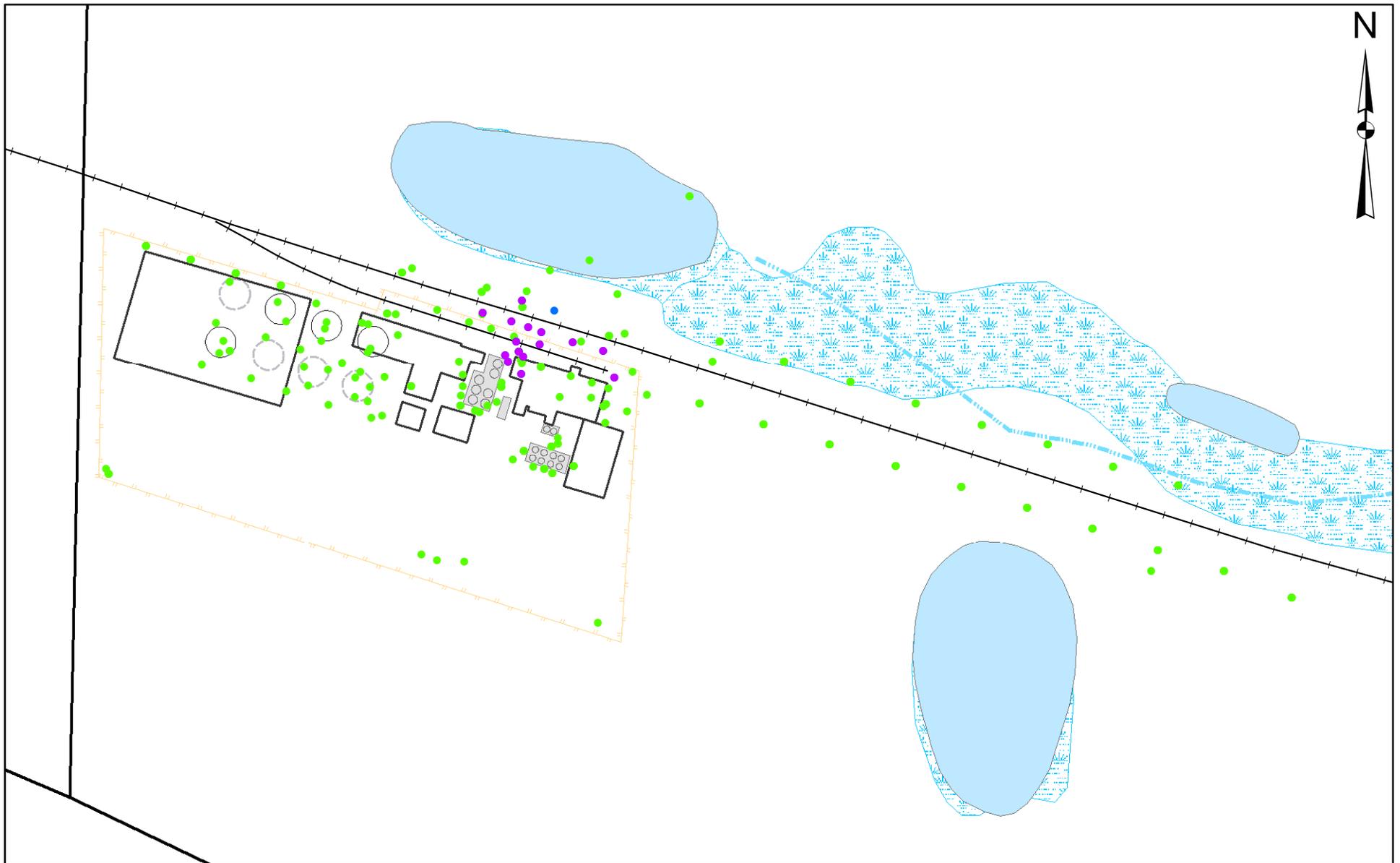


0 100 200 400
 Feet

Legend

- - - USGS Intermittent Streams
- Building
- Fenceline
- Railroad
- Roads
- Tank Farms
- Former Surface Impoundments
- Excavated Surface Impoundments
- Ponds
- Wetlands
- Soil Sample Location
- No Exceedances
- Residential RRS Exceedances
- Industrial RRS Exceedances

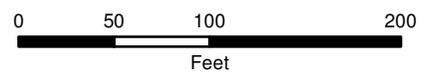
Comparison of Surface Soils from 0 to 2 ft to RRS



Legend

- | | | |
|---------------------------|--------------------------------|-----------------------------|
| USGS Intermittent Streams | Tank Farms | Soil Sample Location |
| Building | Former Surface Impoundments | No Exceedances |
| Fenceline | Excavated Surface Impoundments | Residential RRS Exceedances |
| Railroad | Ponds | Industrial RRS Exceedances |
| Roads | Wetlands | |

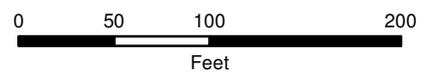
Comparison of Subsurface Soils from 2 to 5 ft to RRS



Legend

- | | | |
|---------------------------|--------------------------------|-----------------------------|
| USGS Intermittent Streams | Tank Farms | Soil Sample Location |
| Building | Former Surface Impoundments | No Exceedances |
| Fenceline | Excavated Surface Impoundments | Residential RRS Exceedances |
| Railroad | Ponds | Industrial RRS Exceedances |
| Roads | Wetlands | |

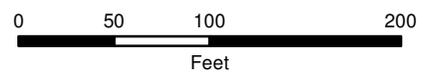
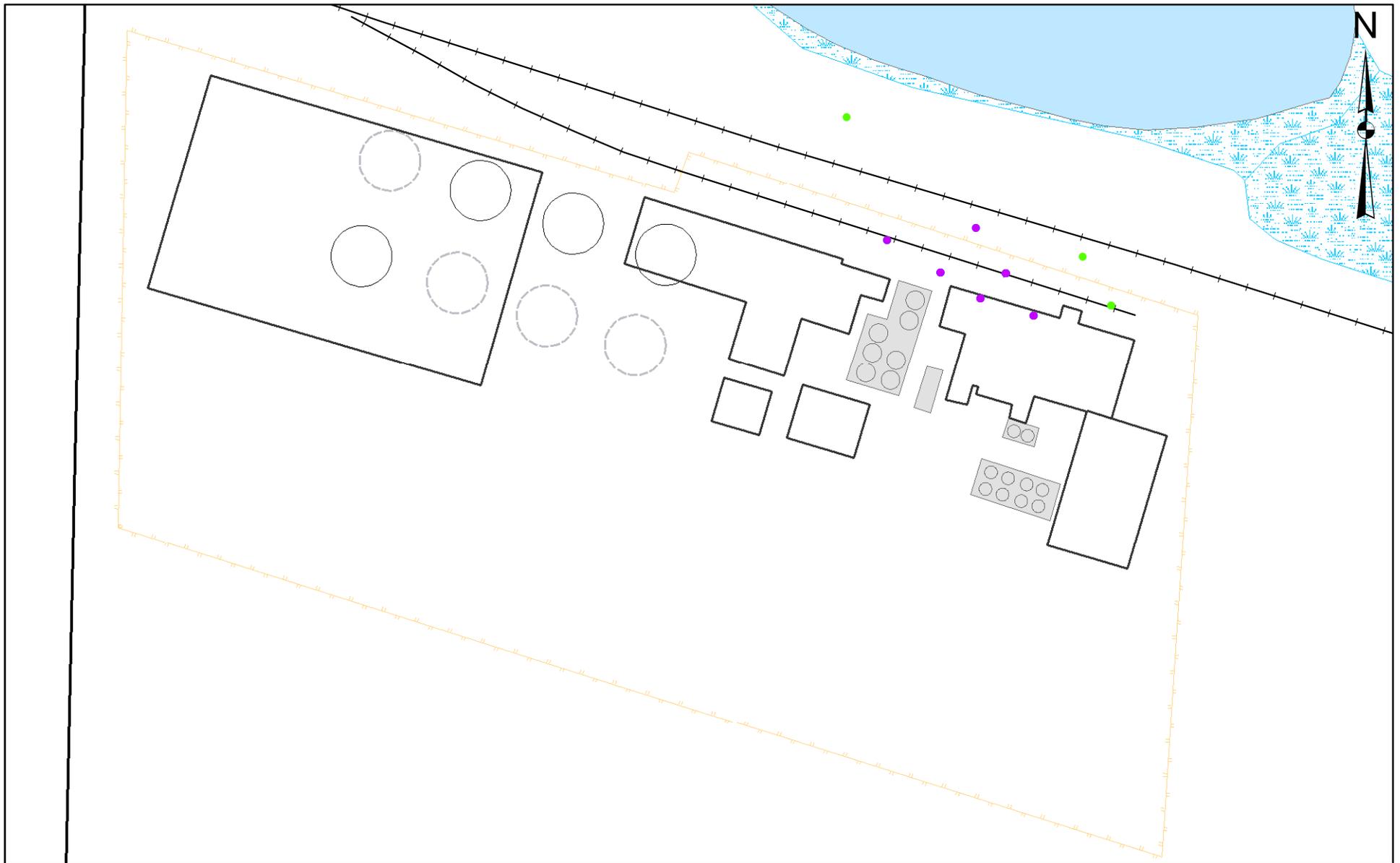
Comparison of Subsurface Soils from 5 to 10 ft to RRS



Legend

- | | | |
|---------------------------|--------------------------------|-----------------------------|
| USGS Intermittent Streams | Tank Farms | Soil Sample Location |
| Building | Former Surface Impoundments | No Exceedances |
| Fenceline | Excavated Surface Impoundments | Residential RRS Exceedances |
| Railroad | Ponds | Industrial RRS Exceedances |
| Roads | Wetlands | |

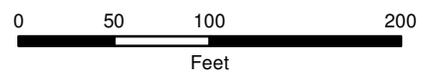
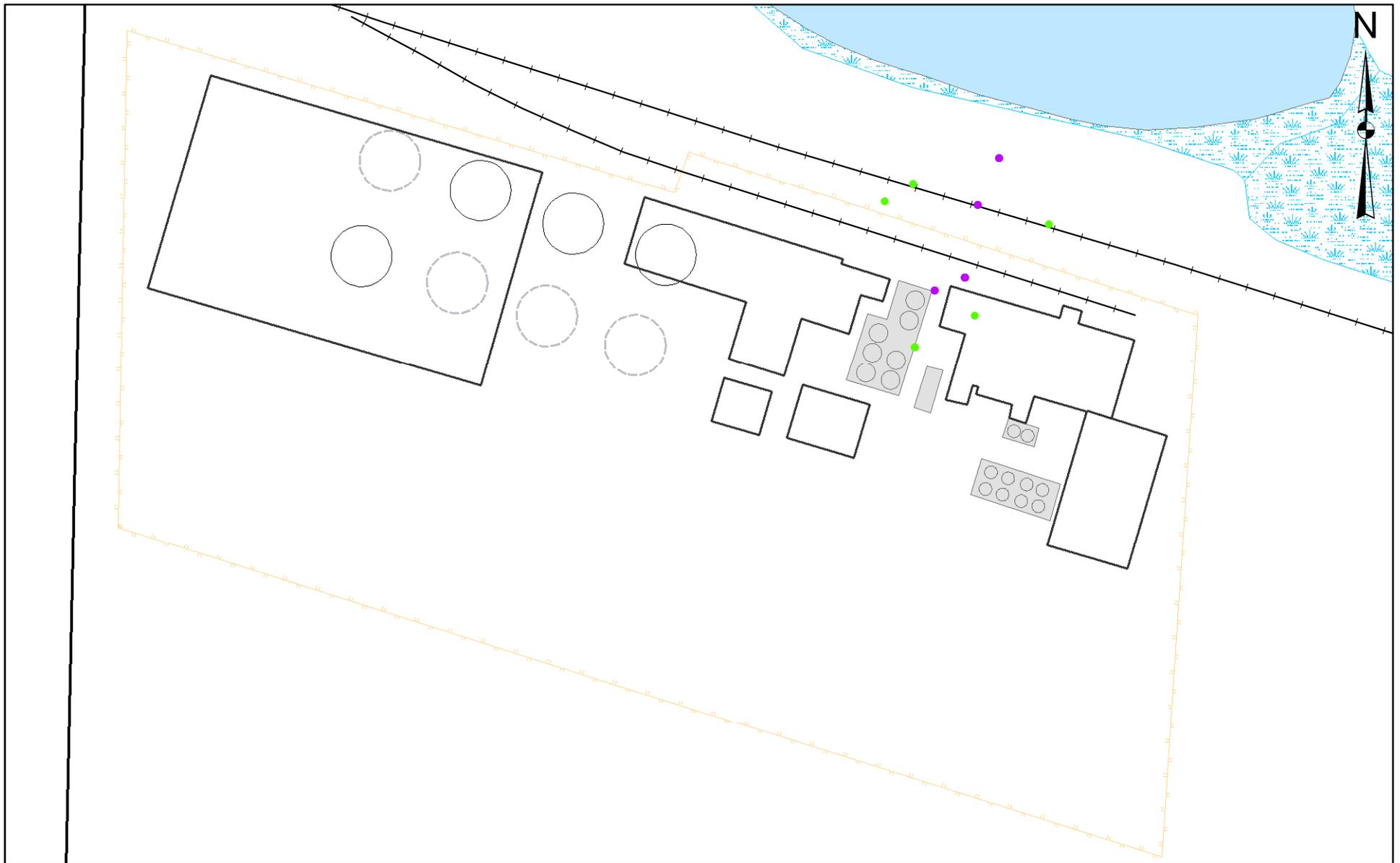
Comparison of Subsurface Soils from 10 to 20 ft to RRS



Legend

- ▬▬▬ USGS Intermittent Streams
- Building
- Fenceline
- | Railroad
- Roads
- Tank Farms
- Former Surface Impoundments
- Excavated Surface Impoundments
- Ponds
- Wetlands
- Soil Sample Location: No Exceedances
- Residential RRS Exceedances
- Industrial RRS Exceedances

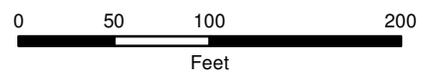
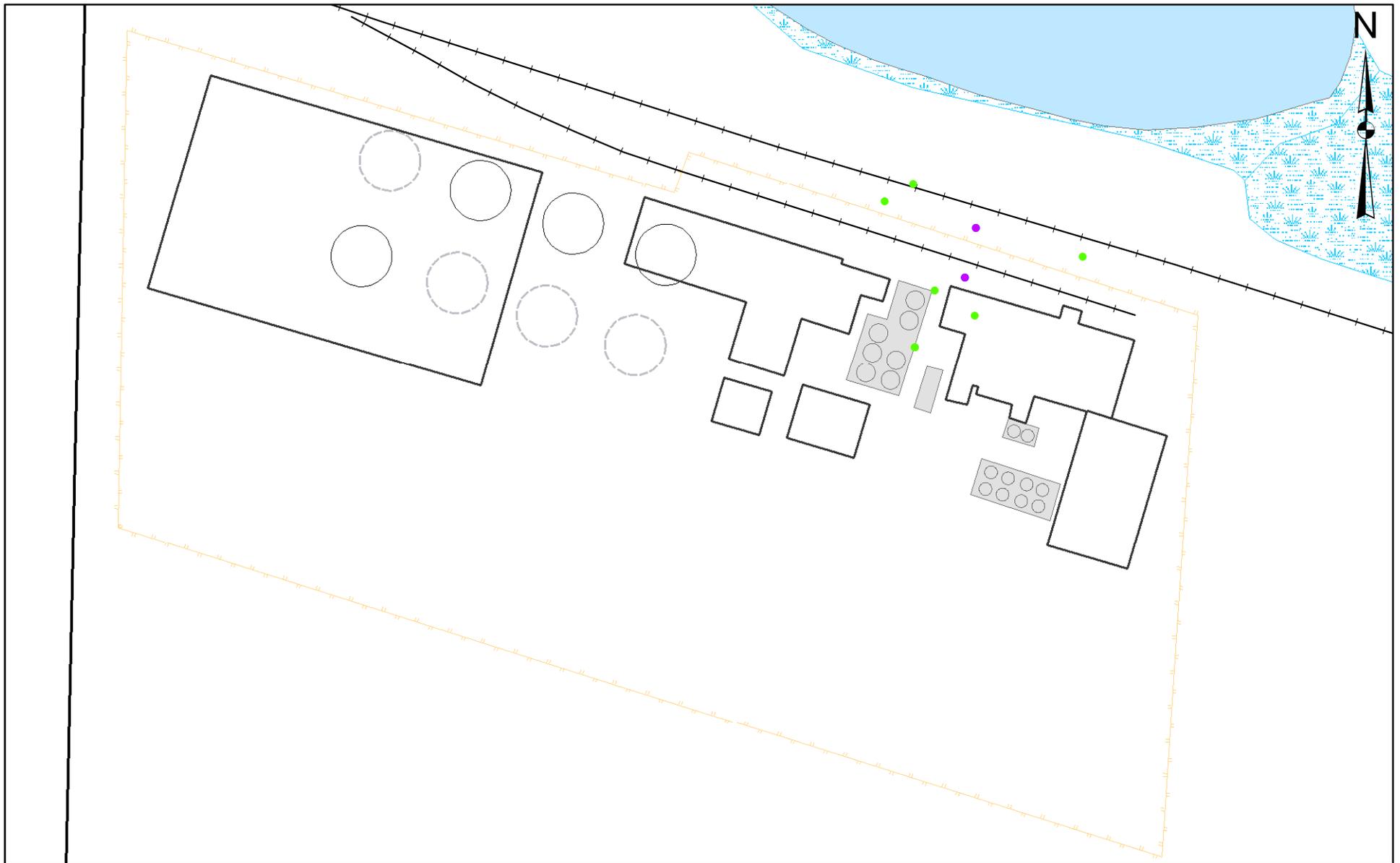
Comparison of Subsurface Soils from 20 to 30 ft to RRS



Legend

- - - - USGS Intermittent Streams
- Building
- Fenceline
- + Railroad
- Roads
- Tank Farms
- Former Surface Impoundments
- Excavated Surface Impoundments
- Ponds
- Wetlands
- Soil Sample Location: No Exceedances
- Residential RRS Exceedances
- Industrial RRS Exceedances

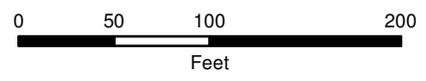
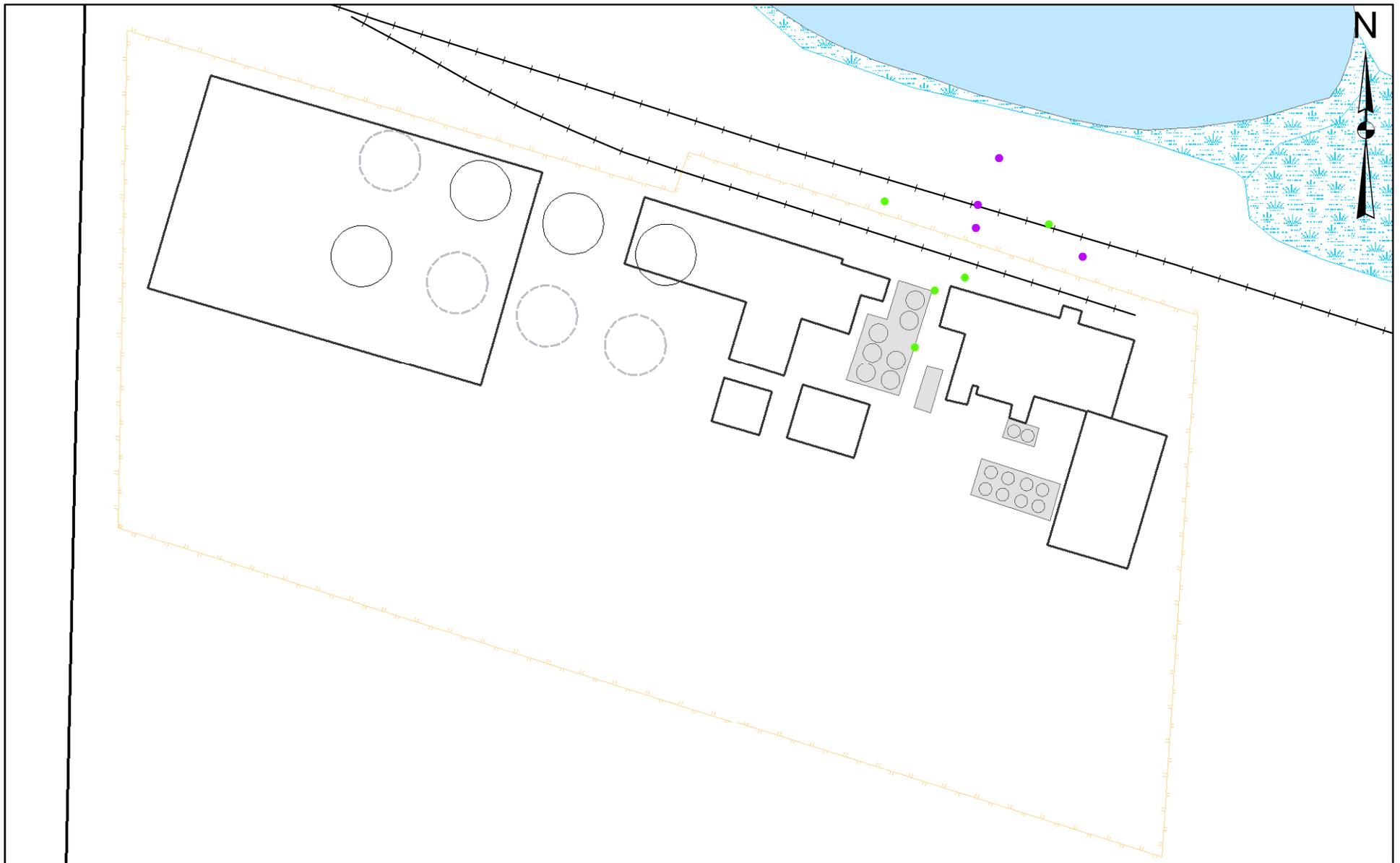
Comparison of Subsurface Soils from 30 to 40 ft to RRS



Legend

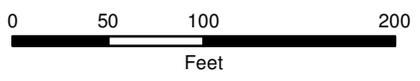
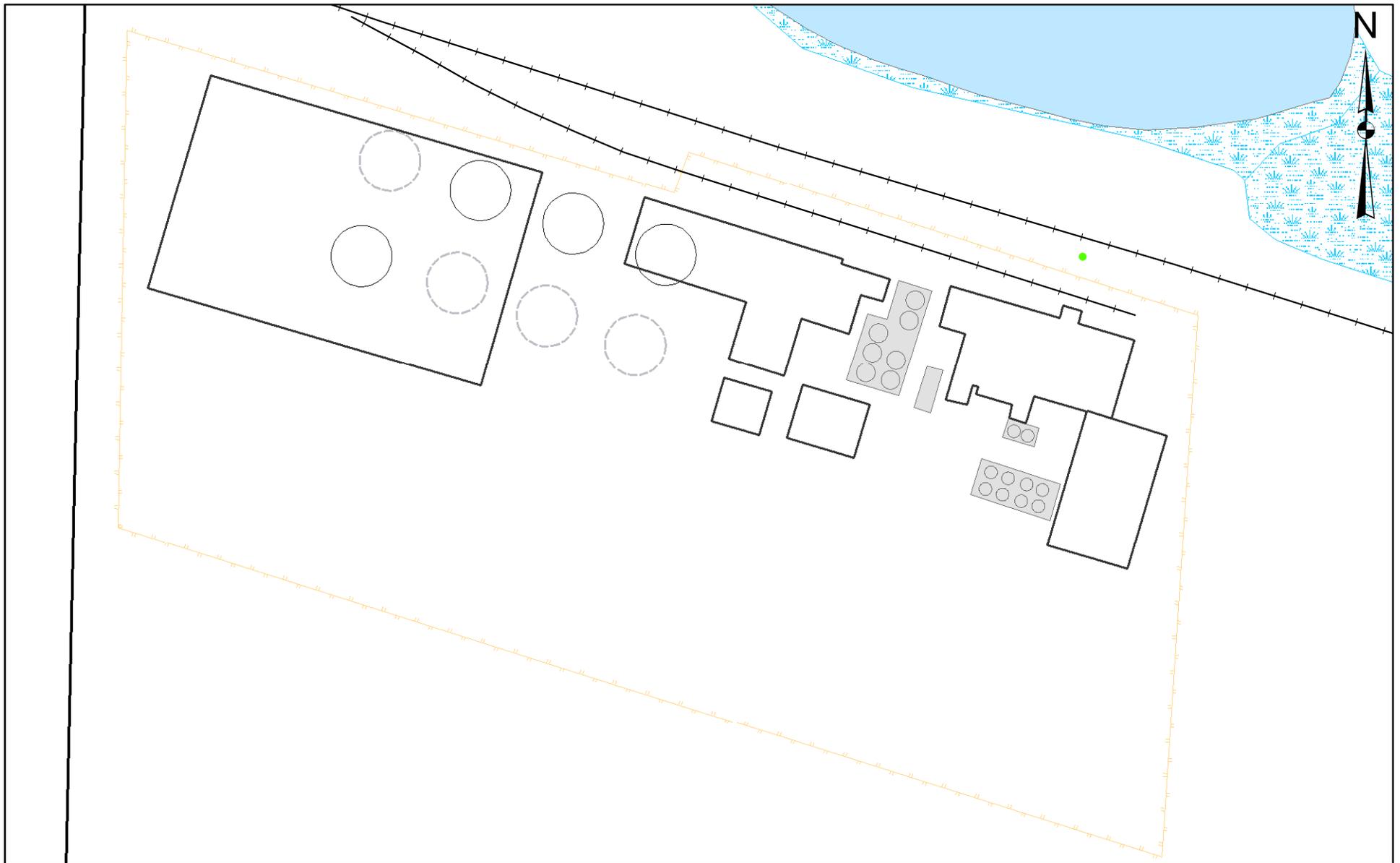
- | | | |
|---------------------------|--------------------------------|-----------------------------|
| USGS Intermittent Streams | Tank Farms | Soil Sample Location |
| Building | Former Surface Impoundments | No Exceedances |
| Fenceline | Excavated Surface Impoundments | Residential RRS Exceedances |
| Railroad | Ponds | Industrial RRS Exceedances |
| Roads | Wetlands | |

Comparison of Subsurface Soils from 40 to 50 ft to RRS



- Legend**
- - - - USGS Intermittent Streams
 - Building
 - Fenceline
 - | Railroad
 - Roads
 - Tank Farms
 - Former Surface Impoundments
 - Excavated Surface Impoundments
 - Ponds
 - Wetlands
 - Soil Sample Location: No Exceedances
 - Residential RRS Exceedances
 - Industrial RRS Exceedances

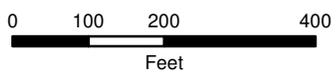
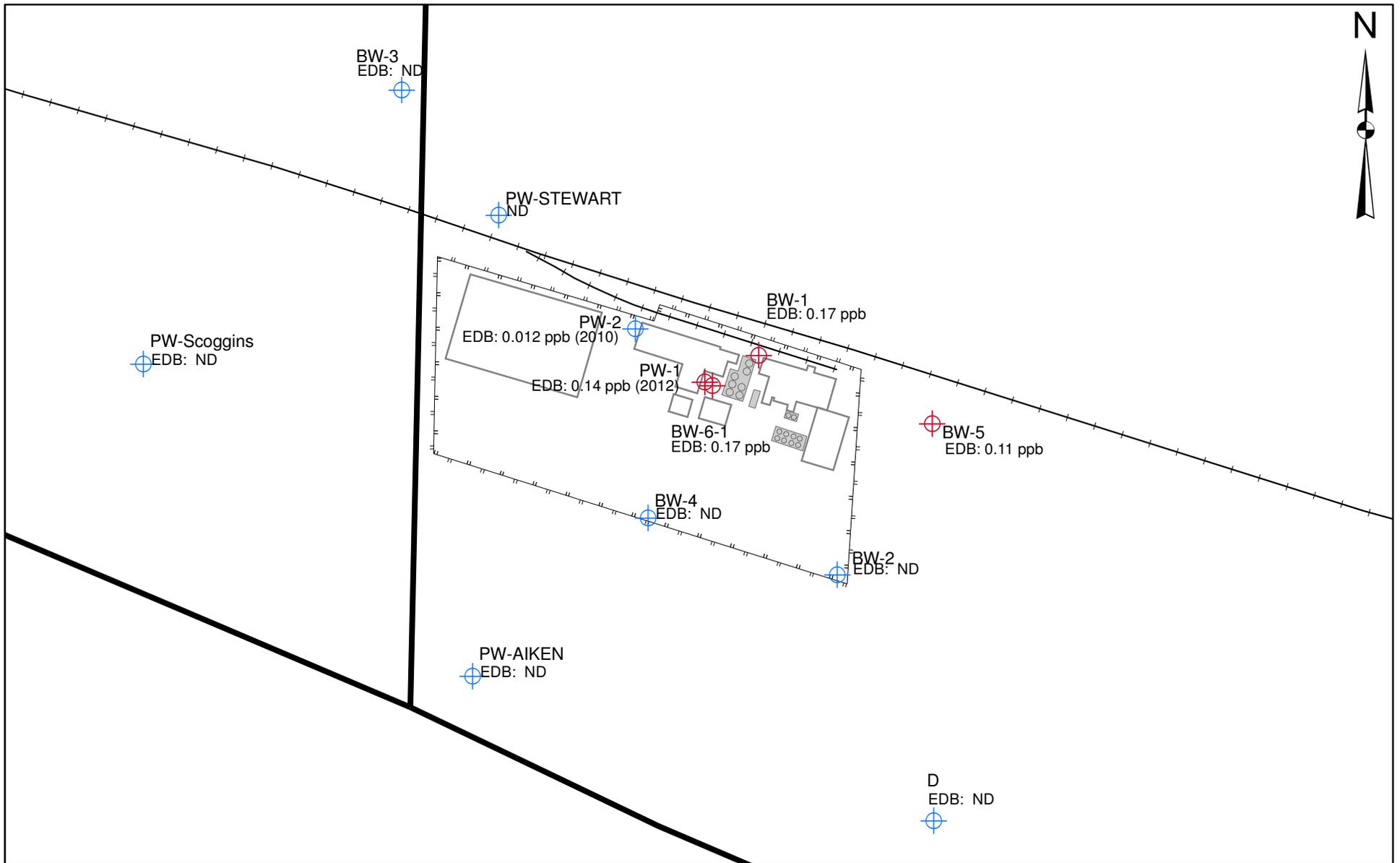
Comparison of Subsurface Soils from 50 to 60 ft to RRS



Legend

- - - - USGS Intermittent Streams
- Building
- Fenceline
- | Railroad
- Roads
- Tank Farms
- Former Surface Impoundments
- Excavated Surface Impoundments
- Ponds
- Wetlands
- Soil Sample Location: No Exceedances
- Residential RRS Exceedances
- Industrial RRS Exceedances

Comparison of Subsurface Soils greater than 60 ft to RRS

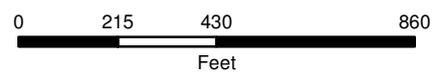
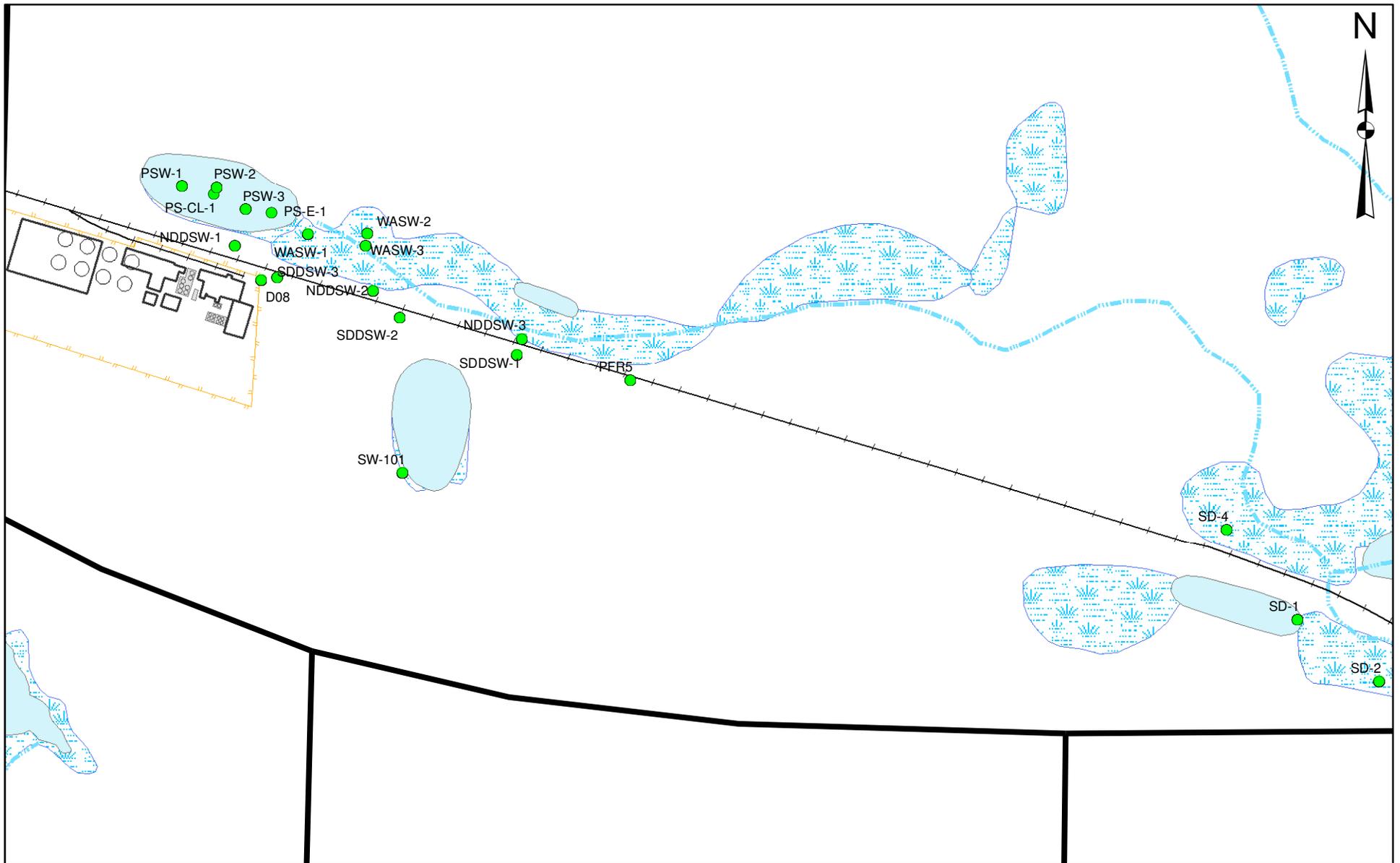


Legend

- Groundwater Wells
 - ⊕ Below GW RRSs
 - ⊕ Above at least one GW RRSs
- EDB Concentrations from most recent time well sampled
- Note: EDB is the only constituent that exceeds its RRS more than once.
- Roads
- Railroad
- Tank Farms
- Sewer Alignment
- Buildings
- Fenceline

Comparison to Groundwater Residential RRSs

Figure No.19

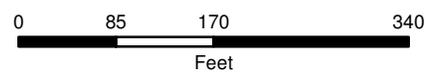
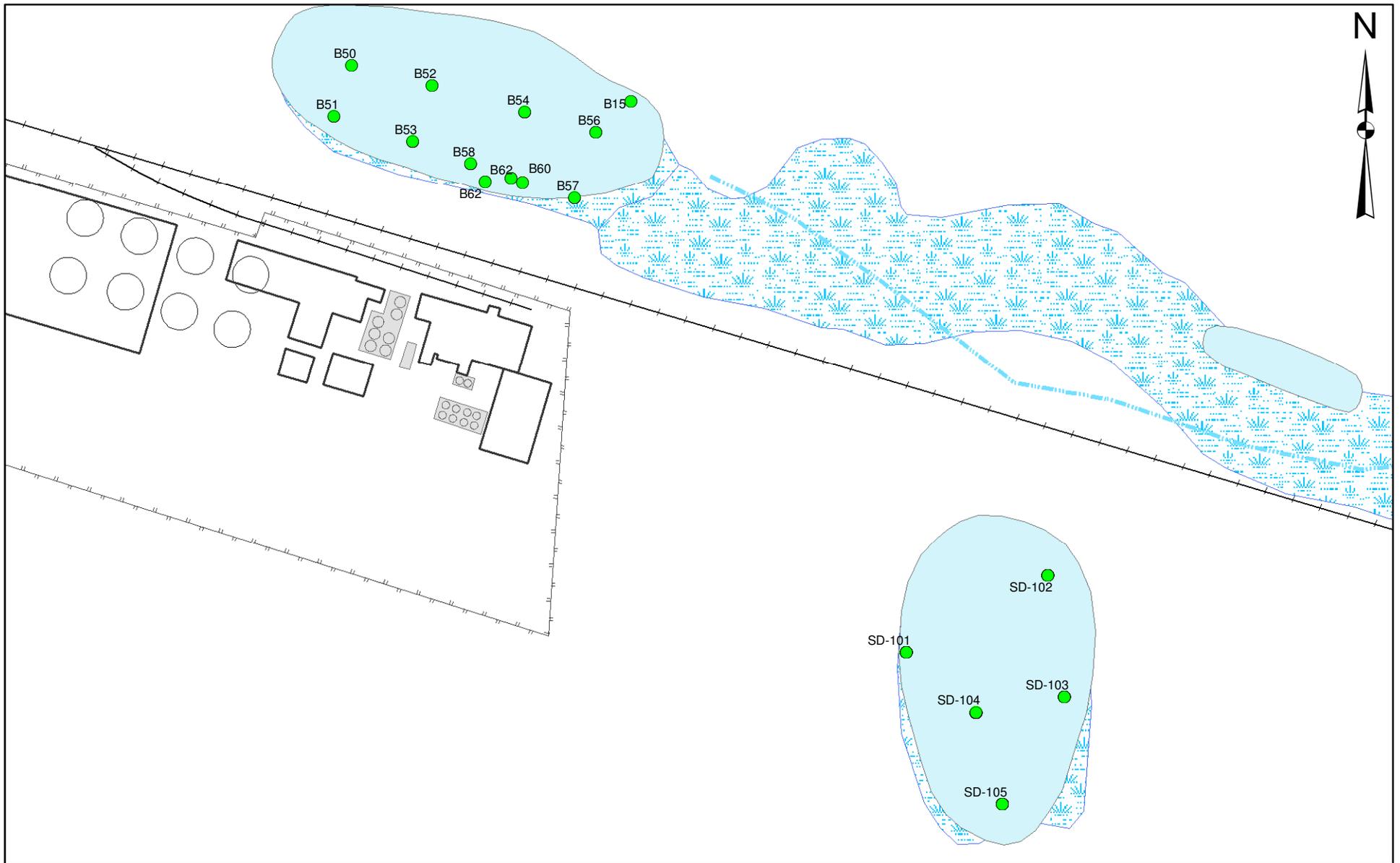


Legend

- Building
- Fenceline
- Railroad
- Roads
- ⊗ Tank Farms
- Surface Impoundments
- ▭ Ponds
- ▭ Wetlands
- Sample Location

Surface Water Sample Locations

Figure No.20

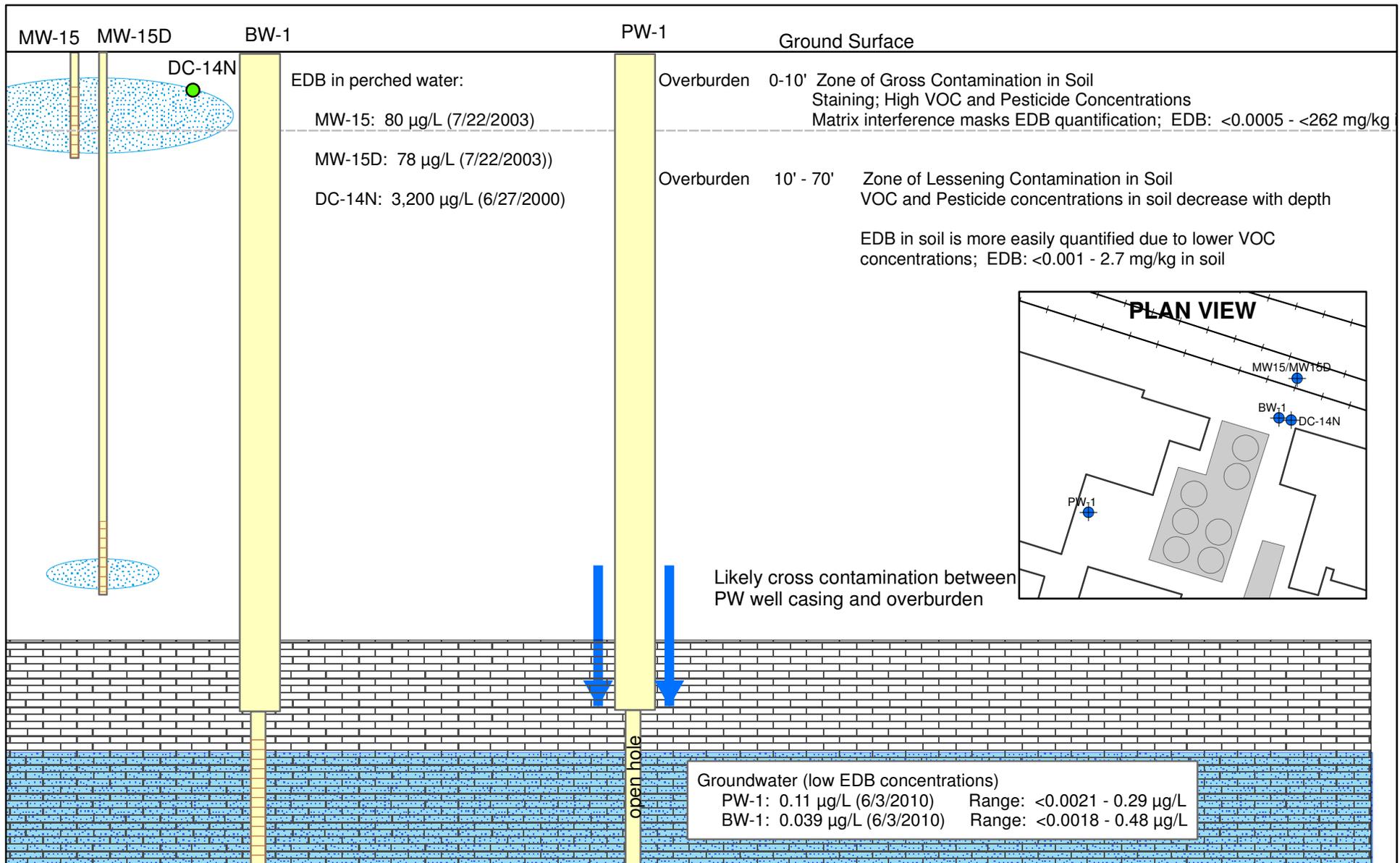


Legend

- Building
- Fence line
- Railroad
- Tank Farms
- Surface Impoundments
- Ponds
- Wetlands
- Sample Locations

Sediment Sample Locations

Figure No.21



Legend

- Perched Water
- Groundwater Aquifer
- Limestone

Conceptual Site Model

Figure No.22

APPENDIX C
HERITAGE INVOICE



INVOICE

HERITAGE ENVIRONMENTAL SVCS, LLC
1987 MOMENTUM PLACE
CHICAGO, IL 60689

Invoice No: 1695703
Invoice Date: 06/10/2014
Customer PO# : 14340
Payment Terms: NET30
HE008 TECH SERV
Customer No: 186101689
Page: 1

DREXEL CHEMICAL

RODNEY HOWARD
P O BOX 13327
MEMPHIS, TN 38113-0327

Please Remit checks to:
HERITAGE ENVIRONMENTAL SVCS, LLC
1987 MOMENTUM PLACE
CHICAGO, IL 60689

Total Amount Due:

\$ 492,679.50

*Contact KIRSTEN SHIELDS at (317)486-2823 with any questions regarding this invoice.

*Please return this page with your remittance. Thank you for your business.

*If you are interested in paying by ACH, please contact your Heritage representative.

HERITAGE ENVIRONMENTAL SVCS, LLC
 1987 MOMENTUM PLACE
 CHICAGO, IL 60689



Invoice No: 1695703
 Invoice Date: 06/10/2014
 Customer PO#: 14340
 Payment Terms: NET30
 HE008 TECH SERV
 Customer No: 186101689

DREXEL CHEMICAL

INVOICE

RODNEY HOWARD
 P O BOX 13327
 MEMPHIS, TN 38113-0327

Page: 3

Pickup Date	Generator	Manifest	Transaction	Product	Weight	Containers	Units	Bill Qty	Unit Price	Extended Price
Delivery Date	Wastestream	Description								
05/15/2014	11	000597717WAS	7009483							
		000597717WAS 1								
		SOIL		8033	42,780	TON		21.39	550.0000	11,764.50
05/14/2014		000597717WAS	7009484							
05/14/2014		CUSTOMER DEMURRAGE (ACTUAL:90 ALLOWED:60)		930		MIN		30.00	1.2500	37.50
05/14/2014		000597718WAS	7009485							
05/15/2014	11	000597718WAS								
		000597718WAS 1								
		SOIL		8033	40,060	TON		20.03	550.0000	11,016.50
05/16/2014		000606356WAS	7012106							
05/17/2014	11	000606356WAS								
		000606356WAS 1								
		SOIL		8033	44,980	TON		22.49	550.0000	12,369.50
05/16/2014		000606357WAS	7012108							
05/18/2014	11	000606357WAS								
		000606357WAS 1								
		SOIL		8033	46,820	TON		23.41	550.0000	12,875.50

HERITAGE ENVIRONMENTAL SVCS, LLC
 1987 MOMENTUM PLACE
 CHICAGO, IL 60689



Invoice No: 1695703
 Invoice Date: 06/10/2014
 Customer PO#: 14340
 Payment Terms: NET30
 HE008 TECH SERV
 Customer No: 186101689

DREXEL CHEMICAL

INVOICE

RODNEY HOWARD
 P O BOX 13327
 MEMPHIS, TN 38113-0327

Page: 4

Pickup Date	Generator	Manifest	Transaction	Product	Weight	Containers	Units	Bill Qty	Unit Price	Extended Price
Delivery Date	Wastestream	Description								
05/19/2014										
05/21/2014	11	000597761WAS	7011978							
		000597761WAS 1								
		SOIL		8033	40,160	TON		20.08	550.0000	11,044.00
05/19/2014										
05/23/2014	11	000597762WAS	7011980							
		000597762WAS 1								
		SOIL		8033	42,800	TON		21.40	550.0000	11,770.00
05/19/2014										
05/22/2014	11	000597763WAS	7011982							
		000597763WAS 1								
		SOIL		8033	37,340	TON		18.67	550.0000	10,268.50
05/19/2014										
05/20/2014	11	000606358WAS	7012110							
		000606358WAS 1								
		SOIL		8033	46,660	TON		23.33	550.0000	12,831.50
05/19/2014										
05/20/2014	11	000606359WAS	7012112							

HERITAGE ENVIRONMENTAL SVCS, LLC
 1987 MOMENTUM PLACE
 CHICAGO, IL 60689



Invoice No: 1695703
 Invoice Date: 06/10/2014
 Customer PO#: 14340
 Payment Terms: NET30
 HE008 TECH SERV
 Customer No: 186101689

DREXEL CHEMICAL

INVOICE

RODNEY HOWARD
 P O BOX 13327
 MEMPHIS, TN 38113-0327

Page: 5

Pickup Date	Generator	Manifest	Transaction	Product	Weight	Containers	Units	Bill Qty	Unit Price	Extended Price
Delivery Date	Wastestream	Description								
		000606359WAS 1								
		SOIL		8033	41,760	TON		20.88	550.0000	11,484.00
05/19/2014										
05/20/2014	11	000606360WAS	7012114							
		000606360WAS 1								
		SOIL		8033	47,300	TON		23.65	550.0000	13,007.50
05/19/2014										
05/20/2014	11	000606361WAS	7012116							
		000606361WAS 1								
		SOIL		8033	45,320	TON		22.66	550.0000	12,463.00
05/20/2014										
05/21/2014	11	000606363WAS	7012120							
		000606363WAS 1								
		SOIL		8033	47,280	TON		23.64	550.0000	13,002.00
05/20/2014										
05/21/2014	11	000597759WAS	7015361							
		000597759WAS 1								
		SOIL		8033	38,880	TON		19.44	550.0000	10,692.00

HERITAGE ENVIRONMENTAL SVCS, LLC
 1987 MOMENTUM PLACE
 CHICAGO, IL 60689



Invoice No: 1695703
 Invoice Date: 06/10/2014
 Customer PO#: 14340
 Payment Terms: NET30
 HE008 TECH SERV
 Customer No: 186101689

DREXEL CHEMICAL

INVOICE

RODNEY HOWARD
 P O BOX 13327
 MEMPHIS, TN 38113-0327

Page: 6

Pickup Date	Generator	Manifest	Transaction	Product	Weight	Containers	Units	Bill Qty	Unit Price	Extended Price
Delivery Date	Wastestream	Description								
05/20/2014 05/20/2014		000597759WAS CUSTOMER DEMURRAGE (ACTUAL:120 ALLOWED:60)	7015363	930			MIN	60.00	1.2500	75.00
05/20/2014 05/21/2014	11	000597760WAS 000597760WAS 1 SOIL	7015364	8033	39,500		TON	19.75	550.0000	10,862.50
05/20/2014 05/20/2014		000597760WAS CUSTOMER DEMURRAGE (ACTUAL:120 ALLOWED:60)	7015365	930			MIN	60.00	1.2500	75.00
05/21/2014 05/22/2014	11	000606364WAS 000606364WAS 1 SOIL	7012122	8033	46,480		TON	23.24	550.0000	12,782.00
05/21/2014 05/22/2014	11	000606365WAS 000606365WAS 1 SOIL	7012124	8033	45,740		TON	22.87	550.0000	12,578.50

HERITAGE ENVIRONMENTAL SVCS, LLC
 1987 MOMENTUM PLACE
 CHICAGO, IL 60689



Invoice No: 1695703
 Invoice Date: 06/10/2014
 Customer PO#: 14340
 Payment Terms: NET30
 HE008 TECH SERV
 Customer No: 186101689

DREXEL CHEMICAL

INVOICE

RODNEY HOWARD
 P O BOX 13327
 MEMPHIS, TN 38113-0327

Page: 7

Pickup Date	Generator	Manifest	Transaction	Product	Weight	Containers	Units	Bill Qty	Unit Price	Extended Price
Delivery Date	Wastestream	Description								
05/21/2014 05/22/2014	11	000606366WAS	7012126							
		000606366WAS 1								
		SOIL		8033	45,000	TON		22.50	550.0000	12,375.00
05/21/2014 05/22/2014	11	000597766WAS	7028005							
		000597766WAS 1								
		SOIL		8033	41,220	TON		20.61	550.0000	11,335.50
05/21/2014 05/22/2014	11	000597767WAS	7028007							
		000597767WAS 1								
		SOIL		8033	30,960	TON		15.48	550.0000	8,514.00
05/21/2014 05/22/2014	11	000597768WAS	7028009							
		000597768WAS 1								
		SOIL		8033	38,620	TON		19.31	550.0000	10,620.50
05/22/2014 05/23/2014	11	000606367WAS	7012129							

HERITAGE ENVIRONMENTAL SVCS, LLC
 1987 MOMENTUM PLACE
 CHICAGO, IL 60689



Invoice No: 1695703
 Invoice Date: 06/10/2014
 Customer PO#: 14340
 Payment Terms: NET30
 HE008 TECH SERV
 Customer No: 186101689

INVOICE

DREXEL CHEMICAL

RODNEY HOWARD
 P O BOX 13327
 MEMPHIS, TN 38113-0327

Page: 8

Pickup Date Delivery Date	Generator Wastestream	Manifest Description	Transaction	Product	Weight	Containers Units	Bill Qty	Unit Price	Extended Price
		000606367WAS 1 SOIL			8033 44,780	TON	22.39	550.0000	12,314.50
05/22/2014 05/23/2014	11	000606368WAS	7012131						
		000606368WAS 1 SOIL			8033 44,000	TON	22.00	550.0000	12,100.00
05/27/2014 05/28/2014	11	000606369WAS	7012133						
		000606369WAS 1 SOIL			8033 45,440	TON	22.72	550.0000	12,496.00
05/27/2014 05/28/2014	11	000606370WAS	7012135						
		000606370WAS 1 SOIL			8033 46,340	TON	23.17	550.0000	12,743.50
05/28/2014 05/29/2014	11	000601078WAS	7032217						
		000601078WAS 1 SOIL			8033 47,180	TON	23.59	550.0000	12,974.50

HERITAGE ENVIRONMENTAL SVCS, LLC
 1987 MOMENTUM PLACE
 CHICAGO, IL 60689



Invoice No: 1695703
 Invoice Date: 06/10/2014
 Customer PO#: 14340
 Payment Terms: NET30
 HE008 TECH SERV
 Customer No: 186101689

DREXEL CHEMICAL

INVOICE

RODNEY HOWARD
 P O BOX 13327
 MEMPHIS, TN 38113-0327

Page: 9

Pickup Date	Generator	Manifest	Transaction	Product	Weight	Containers	Units	Bill Qty	Unit Price	Extended Price
Delivery Date	Wastestream	Description								
05/29/2014										
05/30/2014	11	000601079WAS	7032219							
		000601079WAS 1								
		SOIL		8033	45,820	TON		22.91	550.0000	12,600.50
05/29/2014										
05/30/2014	11	000601080WAS	7032221							
		000601080WAS 1								
		SOIL		8033	42,820	TON		21.41	550.0000	11,775.50
05/29/2014										
05/30/2014	11	000601081WAS	7032223							
		000601081WAS 1								
		SOIL		8033	45,740	TON		22.87	550.0000	12,578.50
05/29/2014										
05/30/2014	11	000601082WAS	7032225							
		000601082WAS 1								
		SOIL		8033	43,820	TON		21.91	550.0000	12,050.50
05/29/2014										
05/30/2014	11	000601083WAS	7032227							

HERITAGE ENVIRONMENTAL SVCS, LLC
 1987 MOMENTUM PLACE
 CHICAGO, IL 60689



Invoice No: 1695703
 Invoice Date: 06/10/2014
 Customer PO#: 14340
 Payment Terms: NET30
 HE008 TECH SERV
 Customer No: 186101689

INVOICE

DREXEL CHEMICAL

RODNEY HOWARD
 P O BOX 13327
 MEMPHIS, TN 38113-0327

Page: 10

Pickup Date	Generator	Manifest	Transaction	Product	Weight	Containers	Units	Bill Qty	Unit Price	Extended Price
Delivery Date	Wastestream	Description								
		000601083WAS 1								
		SOIL		8033	46,440	TON		23.22	550.0000	12,771.00
05/30/2014										
05/31/2014	11	000601084WAS	7032229							
		000601084WAS 1								
		SOIL		8033	44,300	TON		22.15	550.0000	12,182.50
05/30/2014										
05/31/2014	11	000601085WAS	7032231							
		000601085WAS 1								
		SOIL		8033	45,260	TON		22.63	550.0000	12,446.50
06/02/2014										
06/03/2014	11	000601086WAS	7032233							
		000601086WAS 1								
		SOIL		8033	43,560	TON		21.78	550.0000	11,979.00
06/02/2014										
06/03/2014	11	000601087WAS	7032235							
		000601087WAS 1								
		SOIL		8033	44,520	TON		22.26	550.0000	12,243.00

HERITAGE ENVIRONMENTAL SVCS, LLC
 1987 MOMENTUM PLACE
 CHICAGO, IL 60689



Invoice No: 1695703
 Invoice Date: 06/10/2014
 Customer PO#: 14340
 Payment Terms: NET30
 HE008 TECH SERV
 Customer No: 186101689

DREXEL CHEMICAL

INVOICE

RODNEY HOWARD
 P O BOX 13327
 MEMPHIS, TN 38113-0327

Page: 11

Pickup Date	Generator	Manifest	Transaction	Product	Weight	Containers	Units	Bill Qty	Unit Price	Extended Price
Delivery Date	Wastestream	Description								

06/02/2014										
06/03/2014	11	000601088WAS	7032237							
		000601088WAS 1								
		SOIL		8033	49,040	TON		24.52	550.0000	13,486.00

06/02/2014										
06/03/2014	11	000601089WAS	7032239							
		000601089WAS 1								
		SOIL		8033	47,260	TON		23.63	550.0000	12,996.50

06/02/2014										
06/03/2014	11	000601090WAS	7032241							
		000601090WAS 1								
		SOIL		8033	46,080	TON		23.04	550.0000	12,672.00

Pay this Amount \$ 492,679.50

APPENDIX D

**MEMORANDUM RE: ADVANCED CONFIRMATION
SAMPLING FOR PHASE 2 REMEDIATION**

Memorandum

Date: July 2, 2014

To: EPD (John Maddox)

From: EPS (Kirk Kessler, Timmerly Bullman)

Subject: Drexel VRP Project: Advanced Confirmation Sampling for Phase 2 Remediation

BACKGROUND

The Drexel Chemical Company (Drexel) facility located 120 Cape Road, Cordele, Georgia is part of the Georgia Voluntary Remediation Program (VRP). The Fifth Semiannual Progress Report outlined the remediation plan for the Site. The first phase (surface impoundment remediation) is complete. Drexel intends to implement the second phase (rail line remediation) later this year. EPD's approval letter dated June 19, 2014 states the following:

EPD approves the remedial plan to address remaining impacted soil at the site provided limited sidewall confirmation samples are collected from areas where historical data is not sufficient to document concentrations of regulated substances in soil to be left in place. These sidewall samples can be limited to spot checks of areas adjacent to the most heavily contaminated areas of the Drexel East Domain and only in the 0-2' and 5-15' below ground surface intervals. Those concentrations should be compared to the maximum concentrations to be left on-site. If the concentrations identified in sidewall samples do not exceed the proposed maximum concentration for that constituent, then these sidewall sample analytical results do not need to be re-entered into the kriging analysis.

EPD has previously stated that confirmation sampling could be conducted in advance of remediation. Thus, Drexel has elected to conduct this sampling prior to conducting the remediation to ensure that no adjustments need to be made to the remediation plan. This is especially important due to the deep excavations where engineering (slope stability) must be based on a certainty of the excavation plan for cost and safety reasons.

EVALUATION

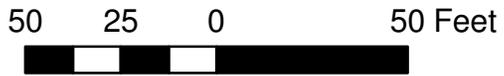
In order to address the EPD's concerns, we evaluated the distance between existing sample points and the proposed remediation cut-lines. The attached figures show this analysis for the two different remediation depth zones mentioned in the EPD's letter: 0-2 ft and 5-15 ft. The blue outlined polygons with hashing indicate the horizontal extent of the remediation areas. The dark blue dots are the locations of historical sample borings. The shaded circles around the dots are a buffer with a radius of 20 ft. Thus, the locations where the blue remediation cut lines are not covered by a shaded circle indicate areas where there are not existing borings within 20 ft.

PROPOSED CONFIRMATION SAMPLE LOCATIONS

The attached figures also show the proposed sample locations as triangles. We propose to advance two borings. Samples will be collected at 1 ft and 10ft below the ground surface. All samples will be analyzed for pesticides (SW8081B) and RCRA metals (SW6010C and SW7471B). The actual locations of the borings will be dependent upon accessibility. Thus, the locations may be adjusted as needed, but will be collected as close as possible to the proposed remediation footprint.

INCORPORATION INTO SITE-WIDE CERTIFICATION

The analytical data will be compared to the maximum concentrations left on-site post-remediation (Table 6B of the Fifth Semi-Annual Progress Report, attached). We will perform re-interpolation of any constituents with concentrations that are higher than the post-remediation maximum concentrations shown on Table 6B. We will then recalculate the post-remediation 95% UCL for these constituents as verification that the remediation plan is sufficient for the site to certify to residential RRSs once the remedial action is complete.



0-2ft Remedial Action Areas and Proposed Confirmation Samples



50 25 0 50 Feet

5-15ft Remediation Areas and Proposed Confirmation Samples

Table 6B Comparison of Post-Remediation Values to Cleanup Criteria - Drexel East Exposure Domain

Parameter	Cleanup Criteria			Pre-Remediation	Post-Remediation	
	Residential RRS (mg/kg)	Industrial SS RRS (mg/kg)	Industrial SB RRS (mg/kg)	Maximum Detected Conc (mg/kg)	Maximum Detected Conc (mg/kg)	Interpolated 95% UCL (mg/kg)
Drexel East 0-2 ft						
4,4'-DDD	19	47	47	88	88	0.18
4,4'-DDE	14	38	38	16	0.24	
4,4'-DDT	20	54	54	340	340	0.61
Arsenic	20	38	41	56	56	3.1
Benzene	0.5	0.5	0.5	45	0.032	
Chlordane	9.2	9.2	9.2	450	3.5	
Dimethoate	0.7	0.7	0.7	1.6	0.6	
Endosulfan I	26	170	170	52	1.8	
Ethyl benzene	70	70	70	170	31	
Isopropylbenzene	22	33	33	81	3.8	
o-Xylene	20	38	38	400	1	
Toxaphene	10.88	10.88	10.88	420	420	4.0
Drexel East 2-5 ft						
4,4'-DDD	19	47	47	21	0.91	
Chlordane	9.2	9.2	9.2	300	0.44	
Dimethoate	0.7	0.7	0.7	0.80	0.03	
Ethyl benzene	70	70	70	1500	1	
Isopropylbenzene	22	33	33	96	ND	
o-Xylene	20	38	38	650	4.8	
Toxaphene	10.88	10.88	10.88	110	3	
Drexel East 5-15 ft						
4,4'-DDD	19	47	47	23	0.53	
4,4'-DDT	20	54	54	120	2.9	
Arsenic	20	38	41	219	12	
Chlordane	9.2	9.2	9.2	390	3.6	
Endosulfan II	10	10	10	18	0.42	
Ethyl benzene	70	70	70	1100	920	2.3
Heptachlor	0.67	0.83	0.83	16	0.22	
Isopropylbenzene	22	33	33	53	0.48	
Malathion	20	20	20	470	20	
Methyl parathion	0.2	1	1	160	0.049	
o-Xylene	20	38	38	1700	1100	6.9
Parathion	20	60	60	260	ND	
Toxaphene	10.88	10.88	10.88	1400	180	1.6
Drexel East >15 ft						
1,2-Dibromoethane*	0.01/0.5	0.01/0.66	0.01/0.66	2.7	2.7	0.0228**
4,4'-DDT	20	54	54	30	30	0.080
Ethyl benzene	70	70	70	220	220	0.46
Malathion	20	20	20	21	21	0.052
Methyl parathion	0.2	1	1	44	44	0.075
o-Xylene	20	38	38	190	190	11
Toxaphene	10.88	10.88	10.88	100	100	0.35

Bold: Exceeds Residential RRS

* Protection of GW RRS / Direct Soil Contact RRS

** Italics: Exceeds Residential RRS for protection of groundwater, but not direct contact

APPENDIX E

**CONFIRMATION SAMPLING LABORATORY DATA
REPORT**



August 01, 2014

Timmerly Bullman
Environmental Planning Specialists, Inc.
1050 Crown Pointe Parkway, Suite 550
Atlanta GA 30338

TEL: (404) 315-9113
FAX: (404) 315-8509

RE: Drexel Chemical Company

Dear Timmerly Bullman:

Order No: 1407K34

Analytical Environmental Services, Inc. received 5 samples on 7/23/2014 2:21:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.

AES' certifications are as follows:

- NELAC/Florida Certification number E87582 for analysis of Environmental Water, soil/hazardous waste, and Drinking Water Microbiology, effective 07/01/14-06/30/15.
- AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Inorganics), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 09/01/15.

These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

James Forrest
Project Manager



3080 Presidential Drive, Atlanta GA 30340-3704

Date: 7/23/14 Page 1 of 1

TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

COMPANY: EPS, Inc		ADDRESS: <u>1050 Crown Pointe Parkway</u> <u>Suite 550</u> <u>Atlanta, GA 30338</u>				ANALYSIS REQUESTED						Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.		No # of Containers																																																					
PHONE: <u>404-315-9113</u>		SIGNATURE:				<table border="1" style="width:100%; height: 100px;"> <tr> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">8081</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">RCRA Metals</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td colspan="18">PRESERVATION (See codes)</td> </tr> <tr> <td colspan="18">REMARKS</td> </tr> </table>									8081	RCRA Metals																			PRESERVATION (See codes)																		REMARKS														
8081	RCRA Metals																																																																		
PRESERVATION (See codes)																																																																			
REMARKS																																																																			
SAMPLED BY: <u>William Crowe</u>		FAX:																																																																	
#	SAMPLE ID	SAMPLED		Grab	Composite	Matrix (See codes)	PRESERVATION (See codes)										REMARKS	No # of Containers																																																	
		DATE	TIME				F	I																																																											
1	<u>14204-B-110-1</u>	<u>7/23/14</u>	<u>1017</u>	X		<u>SO</u>	X	X										<u>2</u>																																																	
2	<u>14204-B-110-10</u>		<u>1028</u>	X		<u>SO</u>	X	X										<u>2</u>																																																	
3	<u>14204-B-111-1</u>		<u>0945</u>	X		<u>SO</u>	X	X										<u>2</u>																																																	
4	<u>14204-B-111-10</u>		<u>1001</u>	X		<u>SO</u>	X	X										<u>2</u>																																																	
5	<u>14204-Dup 1</u>	↓		X		<u>SO</u>	X	X										<u>2</u>																																																	
6																																																																			
7																																																																			
8																																																																			
9																																																																			
10																																																																			
11																																																																			
12																																																																			
13																																																																			
14																																																																			
RELINQUISHED BY		DATE/TIME		RECEIVED BY		DATE/TIME		PROJECT INFORMATION						RECEIPT																																																					
1:		7/23/14 1421		1: <u>Catoy-R</u>		7/23/14 2:21p		PROJECT NAME: <u>Drexel</u>						Total # of Containers: <u>10</u>																																																					
2:				2:				PROJECT #:						Turnaround Time Request <input checked="" type="radio"/> Standard 5 Business Days <input type="radio"/> 2 Business Day Rush <input type="radio"/> Next Business Day Rush <input type="radio"/> Same Day Rush (auth req.) <input type="radio"/> Other _____																																																					
3:				3:				SITE ADDRESS:																																																											
SPECIAL INSTRUCTIONS/COMMENTS:		SHIPMENT METHOD		INVOICE TO:		(IF DIFFERENT FROM ABOVE)		SEND REPORT TO: <u>Tbillman@envplanning.com</u>						STATE PROGRAM (if any): _____																																																					
		OUT / / VIA:		IN / / VIA:										E-mail? Y/N; Fax? Y/N																																																					
		CLIENT FedEx UPS MAIL COURIER		GREYHOUND OTHER _____				QUOTE #:						DATA PACKAGE: I II III IV																																																					
								PO#:																																																											

SAMPLES RECEIVED AFTER 3PM OR ON SATURDAY ARE CONSIDERED RECEIVED THE NEXT BUSINESS DAY. IF TURNAROUND TIME IS NOT INDICATED, AES WILL PROCEED WITH STANDARD TAT OF SAMPLES. SAMPLES ARE DISPOSED 30 DAYS AFTER REPORT COMPLETION UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water
 PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Client: Environmental Planning Specialists, Inc.
Project: Drexel Chemical Company
Lab ID: 1407K34

Case Narrative

Pesticide Analysis by Method 8081B:

Due to sample matrix, samples 1407K34-003A, -004A and -005A required dilution during analysis resulting in elevated reporting limits.

Analytical Environmental Services, Inc

Date: 1-Aug-14

Client: Environmental Planning Specialists, Inc.	Client Sample ID: 1420-B-110-1
Project Name: Drexel Chemical Company	Collection Date: 7/23/2014 10:17:00 AM
Lab ID: 1407K34-001	Matrix: Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TOTAL MERCURY SW7471B		(SW7471B)						
Mercury	BRL	0.112		mg/Kg-dry	194080	1	07/25/2014 11:31	CG
CHLORINATED PESTICIDES SW8081B		(SW3550C)						
4,4'-DDD	BRL	3.8		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
4,4'-DDE	BRL	3.8		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
4,4'-DDT	BRL	3.8		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Aldrin	BRL	1.9		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
alpha-BHC	BRL	1.9		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
alpha-Chlordane	BRL	1.9		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
beta-BHC	BRL	1.9		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Chlordane	BRL	38		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
delta-BHC	BRL	1.9		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Dieldrin	BRL	3.8		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Endosulfan I	BRL	1.9		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Endosulfan II	BRL	3.8		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Endosulfan sulfate	BRL	3.8		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Endrin	BRL	3.8		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Endrin aldehyde	BRL	3.8		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Endrin ketone	BRL	3.8		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
gamma-BHC	BRL	1.9		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
gamma-Chlordane	BRL	1.9		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Heptachlor	BRL	1.9		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Heptachlor epoxide	BRL	1.9		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Methoxychlor	BRL	19		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Toxaphene	BRL	190		ug/Kg-dry	194090	1	07/30/2014 21:03	RS
Surr: Decachlorobiphenyl	113	25.2-120		%REC	194090	1	07/30/2014 21:03	RS
Surr: Tetrachloro-m-xylene	86.6	30.5-120		%REC	194090	1	07/30/2014 21:03	RS
METALS, TOTAL SW6010C		(SW3050B)						
Arsenic	BRL	2.90		mg/Kg-dry	194063	1	07/25/2014 11:39	JL
Barium	3.97	2.90		mg/Kg-dry	194063	1	07/25/2014 11:39	JL
Cadmium	BRL	1.45		mg/Kg-dry	194063	1	07/25/2014 11:39	JL
Chromium	13.4	1.45		mg/Kg-dry	194063	1	07/25/2014 11:39	JL
Lead	BRL	2.90		mg/Kg-dry	194063	1	07/25/2014 11:39	JL
Selenium	BRL	2.90		mg/Kg-dry	194063	1	07/25/2014 11:39	JL
Silver	BRL	1.45		mg/Kg-dry	194063	1	07/25/2014 11:39	JL
PERCENT MOISTURE D2216								
Percent Moisture	12.3	0		wt%	R272564	1	07/28/2014 11:30	SG

Qualifiers:	* Value exceeds maximum contaminant level	E Estimated (value above quantitation range)
	BRL Below reporting limit	S Spike Recovery outside limits due to matrix
	H Holding times for preparation or analysis exceeded	Narr See case narrative
	N Analyte not NELAC certified	NC Not confirmed
	B Analyte detected in the associated method blank	< Less than Result value
	> Greater than Result value	J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 1-Aug-14

Client: Environmental Planning Specialists, Inc.	Client Sample ID: 14204-B-110-10
Project Name: Drexel Chemical Company	Collection Date: 7/23/2014 10:28:00 AM
Lab ID: 1407K34-002	Matrix: Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TOTAL MERCURY SW7471B					(SW7471B)			
Mercury	BRL	0.123		mg/Kg-dry	194080	1	07/25/2014 11:33	CG
CHLORINATED PESTICIDES SW8081B					(SW3550C)			
4,4'-DDD	BRL	4.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
4,4'-DDE	BRL	4.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
4,4'-DDT	BRL	4.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Aldrin	BRL	2.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
alpha-BHC	BRL	2.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
alpha-Chlordane	BRL	2.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
beta-BHC	BRL	2.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Chlordane	BRL	41		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
delta-BHC	BRL	2.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Dieldrin	BRL	4.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Endosulfan I	BRL	2.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Endosulfan II	BRL	4.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Endosulfan sulfate	BRL	4.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Endrin	BRL	4.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Endrin aldehyde	BRL	4.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Endrin ketone	BRL	4.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
gamma-BHC	BRL	2.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
gamma-Chlordane	BRL	2.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Heptachlor	BRL	2.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Heptachlor epoxide	BRL	2.1		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Methoxychlor	BRL	21		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Toxaphene	BRL	210		ug/Kg-dry	194090	1	07/30/2014 21:14	RS
Surr: Decachlorobiphenyl	65	25.2-120		%REC	194090	1	07/30/2014 21:14	RS
Surr: Tetrachloro-m-xylene	44	30.5-120		%REC	194090	1	07/30/2014 21:14	RS
METALS, TOTAL SW6010C					(SW3050B)			
Arsenic	BRL	5.40		mg/Kg-dry	194063	1	07/25/2014 11:43	JL
Barium	BRL	5.40		mg/Kg-dry	194063	1	07/25/2014 11:43	JL
Cadmium	BRL	2.70		mg/Kg-dry	194063	1	07/25/2014 11:43	JL
Chromium	16.4	2.70		mg/Kg-dry	194063	1	07/25/2014 11:43	JL
Lead	BRL	5.40		mg/Kg-dry	194063	1	07/25/2014 11:43	JL
Selenium	BRL	5.40		mg/Kg-dry	194063	1	07/25/2014 11:43	JL
Silver	BRL	2.70		mg/Kg-dry	194063	1	07/25/2014 11:43	JL
PERCENT MOISTURE D2216								
Percent Moisture	19.7	0		wt%	R272564	1	07/28/2014 11:30	SG

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value

- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 1-Aug-14

Client: Environmental Planning Specialists, Inc.	Client Sample ID: 14204-B-111-1
Project Name: Drexel Chemical Company	Collection Date: 7/23/2014 9:45:00 AM
Lab ID: 1407K34-003	Matrix: Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TOTAL MERCURY SW7471B					(SW7471B)			
Mercury	BRL	0.113		mg/Kg-dry	194080	1	07/25/2014 11:35	CG
CHLORINATED PESTICIDES SW8081B					(SW3550C)			
4,4'-DDD	BRL	380		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
4,4'-DDE	BRL	380		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
4,4'-DDT	BRL	380		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Aldrin	BRL	190		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
alpha-BHC	BRL	190		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
alpha-Chlordane	BRL	190		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
beta-BHC	BRL	190		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Chlordane	BRL	3800		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
delta-BHC	BRL	190		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Dieldrin	BRL	380		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Endosulfan I	BRL	190		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Endosulfan II	BRL	380		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Endosulfan sulfate	BRL	380		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Endrin	BRL	380		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Endrin aldehyde	BRL	380		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Endrin ketone	BRL	380		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
gamma-BHC	BRL	190		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
gamma-Chlordane	BRL	190		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Heptachlor	BRL	190		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Heptachlor epoxide	BRL	190		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Methoxychlor	BRL	1900		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Toxaphene	35000	19000		ug/Kg-dry	194090	100	07/31/2014 16:13	RS
Surr: Decachlorobiphenyl	0	25.2-120	S	%REC	194090	100	07/31/2014 16:13	RS
Surr: Tetrachloro-m-xylene	0	30.5-120	S	%REC	194090	100	07/31/2014 16:13	RS
METALS, TOTAL SW6010C					(SW3050B)			
Arsenic	BRL	5.67		mg/Kg-dry	194063	1	07/25/2014 11:47	JL
Barium	47.9	5.67		mg/Kg-dry	194063	1	07/25/2014 11:47	JL
Cadmium	BRL	2.83		mg/Kg-dry	194063	1	07/25/2014 11:47	JL
Chromium	17.0	2.83		mg/Kg-dry	194063	1	07/25/2014 11:47	JL
Lead	16.2	5.67		mg/Kg-dry	194063	1	07/25/2014 11:47	JL
Selenium	BRL	5.67		mg/Kg-dry	194063	1	07/25/2014 11:47	JL
Silver	BRL	2.83		mg/Kg-dry	194063	1	07/25/2014 11:47	JL
PERCENT MOISTURE D2216								
Percent Moisture	12.2	0		wt%	R272564	1	07/28/2014 11:30	SG

Qualifiers:	* Value exceeds maximum contaminant level	E Estimated (value above quantitation range)
	BRL Below reporting limit	S Spike Recovery outside limits due to matrix
	H Holding times for preparation or analysis exceeded	Narr See case narrative
	N Analyte not NELAC certified	NC Not confirmed
	B Analyte detected in the associated method blank	< Less than Result value
	> Greater than Result value	J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 1-Aug-14

Client: Environmental Planning Specialists, Inc.	Client Sample ID: 14204-B-111-10
Project Name: Drexel Chemical Company	Collection Date: 7/23/2014 10:01:00 AM
Lab ID: 1407K34-004	Matrix: Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TOTAL MERCURY SW7471B		(SW7471B)						
Mercury	BRL	0.123		mg/Kg-dry	194080	1	07/25/2014 11:42	CG
CHLORINATED PESTICIDES SW8081B		(SW3550C)						
4,4'-DDD	BRL	83		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
4,4'-DDE	BRL	83		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
4,4'-DDT	BRL	83		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Aldrin	BRL	42		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
alpha-BHC	BRL	42		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
alpha-Chlordane	BRL	42		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
beta-BHC	BRL	42		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Chlordane	BRL	830		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
delta-BHC	BRL	42		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Dieldrin	BRL	83		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Endosulfan I	BRL	42		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Endosulfan II	BRL	83		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Endosulfan sulfate	BRL	83		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Endrin	BRL	83		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Endrin aldehyde	BRL	83		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Endrin ketone	BRL	83		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
gamma-BHC	BRL	42		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
gamma-Chlordane	BRL	42		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Heptachlor	BRL	42		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Heptachlor epoxide	BRL	42		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Methoxychlor	BRL	420		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Toxaphene	4900	4200		ug/Kg-dry	194090	20	07/30/2014 21:36	RS
Surr: Decachlorobiphenyl	0	25.2-120	S	%REC	194090	20	07/30/2014 21:36	RS
Surr: Tetrachloro-m-xylene	0	30.5-120	S	%REC	194090	20	07/30/2014 21:36	RS
METALS, TOTAL SW6010C		(SW3050B)						
Arsenic	BRL	5.84		mg/Kg-dry	194063	1	07/25/2014 11:51	JL
Barium	7.81	5.84		mg/Kg-dry	194063	1	07/25/2014 11:51	JL
Cadmium	BRL	2.92		mg/Kg-dry	194063	1	07/25/2014 11:51	JL
Chromium	15.9	2.92		mg/Kg-dry	194063	1	07/25/2014 11:51	JL
Lead	BRL	5.84		mg/Kg-dry	194063	1	07/25/2014 11:51	JL
Selenium	BRL	5.84		mg/Kg-dry	194063	1	07/25/2014 11:51	JL
Silver	BRL	2.92		mg/Kg-dry	194063	1	07/25/2014 11:51	JL
PERCENT MOISTURE D2216								
Percent Moisture	20.2	0		wt%	R272564	1	07/28/2014 11:30	SG

Qualifiers:	* Value exceeds maximum contaminant level	E Estimated (value above quantitation range)
	BRL Below reporting limit	S Spike Recovery outside limits due to matrix
	H Holding times for preparation or analysis exceeded	Narr See case narrative
	N Analyte not NELAC certified	NC Not confirmed
	B Analyte detected in the associated method blank	< Less than Result value
	> Greater than Result value	J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 1-Aug-14

Client: Environmental Planning Specialists, Inc.	Client Sample ID: 14204-DUP1
Project Name: Drexel Chemical Company	Collection Date: 7/23/2014
Lab ID: 1407K34-005	Matrix: Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TOTAL MERCURY SW7471B		(SW7471B)						
Mercury	BRL	0.115		mg/Kg-dry	194080	1	07/25/2014 11:44	CG
CHLORINATED PESTICIDES SW8081B		(SW3550C)						
4,4'-DDD	BRL	39		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
4,4'-DDE	BRL	39		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
4,4'-DDT	BRL	39		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Aldrin	BRL	19		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
alpha-BHC	BRL	19		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
alpha-Chlordane	BRL	19		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
beta-BHC	BRL	19		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Chlordane	990	390		ug/Kg-dry	194090	10	07/31/2014 20:29	RS
delta-BHC	BRL	19		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Dieldrin	BRL	39		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Endosulfan I	BRL	19		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Endosulfan II	BRL	39		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Endosulfan sulfate	BRL	39		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Endrin	BRL	39		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Endrin aldehyde	BRL	39		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Endrin ketone	BRL	39		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
gamma-BHC	BRL	19		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
gamma-Chlordane	BRL	19		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Heptachlor	BRL	19		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Heptachlor epoxide	BRL	19		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Methoxychlor	BRL	190		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Toxaphene	BRL	1900		ug/Kg-dry	194090	10	07/30/2014 21:47	RS
Surr: Decachlorobiphenyl	0	25.2-120	S	%REC	194090	10	07/30/2014 21:47	RS
Surr: Tetrachloro-m-xylene	0.08	30.5-120	S	%REC	194090	10	07/30/2014 21:47	RS
METALS, TOTAL SW6010C		(SW3050B)						
Arsenic	4.69	4.09		mg/Kg-dry	194063	1	07/25/2014 11:55	JL
Barium	BRL	4.09		mg/Kg-dry	194063	1	07/25/2014 11:55	JL
Cadmium	BRL	2.04		mg/Kg-dry	194063	1	07/25/2014 11:55	JL
Chromium	35.6	2.04		mg/Kg-dry	194063	1	07/25/2014 11:55	JL
Lead	7.59	4.09		mg/Kg-dry	194063	1	07/25/2014 11:55	JL
Selenium	BRL	4.09		mg/Kg-dry	194063	1	07/25/2014 11:55	JL
Silver	BRL	2.04		mg/Kg-dry	194063	1	07/25/2014 11:55	JL
PERCENT MOISTURE D2216								
Percent Moisture	14.0	0		wt%	R272564	1	07/28/2014 11:30	SG

Qualifiers:	* Value exceeds maximum contaminant level	E Estimated (value above quantitation range)
	BRL Below reporting limit	S Spike Recovery outside limits due to matrix
	H Holding times for preparation or analysis exceeded	Narr See case narrative
	N Analyte not NELAC certified	NC Not confirmed
	B Analyte detected in the associated method blank	< Less than Result value
	> Greater than Result value	J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client EPS Work Order Number 1407K34

Checklist completed by [Signature] Date 7/24/14

Carrier name: FedEx ___ UPS ___ Courier ___ Client US Mail ___ Other ___

Shipping container/cooler in good condition? Yes No ___ Not Present ___

Custody seals intact on shipping container/cooler? Yes ___ No ___ Not Present

Custody seals intact on sample bottles? Yes ___ No ___ Not Present

Container/Temp Blank temperature in compliance? (4°C±2)* Yes No ___

Cooler #1 3.6 Cooler #2 ___ Cooler #3 ___ Cooler #4 ___ Cooler#5 ___ Cooler #6 ___

Chain of custody present? Yes No ___

Chain of custody signed when relinquished and received? Yes No ___

Chain of custody agrees with sample labels? Yes No ___

Samples in proper container/bottle? Yes No ___

Sample containers intact? Yes No ___

Sufficient sample volume for indicated test? Yes No ___

All samples received within holding time? Yes No ___

Was TAT marked on the COC? Yes No ___

Proceed with Standard TAT as per project history? Yes ___ No ___ Not Applicable

Water - VOA vials have zero headspace? No VOA vials submitted Yes ___ No ___

Water - pH acceptable upon receipt? Yes ___ No ___ Not Applicable

Adjusted? ___ Checked by ___

Sample Condition: Good Other(Explain) ___

(For diffusive samples or AIHA lead) Is a known blank included? Yes ___ No

See Case Narrative for resolution of the Non-Conformance.

* Samples do not have to comply with the given range for certain parameters.

Client: Environmental Planning Specialists, Inc.
Project Name: Drexel Chemical Company
Workorder: 1407K34

ANALYTICAL QC SUMMARY REPORT

BatchID: 194063

Sample ID: MB-194063	Client ID:	Units: mg/Kg	Prep Date: 07/24/2014	Run No: 272402							
SampleType: MBLK	TestCode: METALS, TOTAL SW6010C	BatchID: 194063	Analysis Date: 07/24/2014	Seq No: 5748682							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Arsenic	BRL	5.00									
Barium	BRL	5.00									
Cadmium	BRL	2.50									
Chromium	BRL	2.50									
Lead	BRL	5.00									
Selenium	BRL	5.00									
Silver	BRL	2.50									

Sample ID: LCS-194063	Client ID:	Units: mg/Kg	Prep Date: 07/24/2014	Run No: 272402							
SampleType: LCS	TestCode: METALS, TOTAL SW6010C	BatchID: 194063	Analysis Date: 07/24/2014	Seq No: 5748679							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Arsenic	44.64	5.00	50.00		89.3	80	120				
Barium	45.38	5.00	50.00		90.8	80	120				
Cadmium	44.65	2.50	50.00		89.3	80	120				
Chromium	45.57	2.50	50.00		91.1	80	120				
Lead	44.85	5.00	50.00		89.7	80	120				
Selenium	45.13	5.00	50.00		90.3	80	120				
Silver	4.407	2.50	5.000		88.1	80	120				

Sample ID: 1407K85-001BMS	Client ID:	Units: mg/Kg-dry	Prep Date: 07/24/2014	Run No: 272402							
SampleType: MS	TestCode: METALS, TOTAL SW6010C	BatchID: 194063	Analysis Date: 07/24/2014	Seq No: 5748691							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Arsenic	51.58	5.77	57.69	0.3134	88.9	75	125				
Barium	72.18	5.77	57.69	21.96	87.0	75	125				
Cadmium	51.54	2.88	57.69	0.4399	88.6	75	125				
Chromium	56.74	2.88	57.69	6.833	86.5	75	125				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Drexel Chemical Company
Workorder: 1407K34

ANALYTICAL QC SUMMARY REPORT

BatchID: 194063

Sample ID: 1407K85-001BMS	Client ID:	Units: mg/Kg-dry	Prep Date: 07/24/2014	Run No: 272402							
SampleType: MS	TestCode: METALS, TOTAL SW6010C	BatchID: 194063	Analysis Date: 07/24/2014	Seq No: 5748691							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Lead	89.69	5.77	57.69	38.87	88.1	75	125				
Selenium	52.36	5.77	57.69		90.7	75	125				
Silver	5.073	2.88	5.769		87.9	75	125				

Sample ID: 1407K85-001BMSD	Client ID:	Units: mg/Kg-dry	Prep Date: 07/24/2014	Run No: 272402							
SampleType: MSD	TestCode: METALS, TOTAL SW6010C	BatchID: 194063	Analysis Date: 07/24/2014	Seq No: 5748692							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Arsenic	50.47	5.75	57.46	0.3134	87.3	75	125	51.58	2.18	20	
Barium	67.72	5.75	57.46	21.96	79.6	75	125	72.18	6.38	20	
Cadmium	50.56	2.87	57.46	0.4399	87.2	75	125	51.54	1.92	20	
Chromium	57.72	2.87	57.46	6.833	88.6	75	125	56.74	1.72	20	
Lead	83.26	5.75	57.46	38.87	77.2	75	125	89.69	7.44	20	
Selenium	51.41	5.75	57.46		89.5	75	125	52.36	1.83	20	
Silver	4.962	2.87	5.746		86.4	75	125	5.073	2.22	20	

Qualifiers:	> Greater than Result value	< Less than Result value	B Analyte detected in the associated method blank
BRL	Below reporting limit	E Estimated (value above quantitation range)	H Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N Analyte not NELAC certified	R RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S Spike Recovery outside limits due to matrix	

Client: Environmental Planning Specialists, Inc.
Project Name: Drexel Chemical Company
Workorder: 1407K34

ANALYTICAL QC SUMMARY REPORT

BatchID: 194080

Sample ID: MB-194080	Client ID:	Units: mg/Kg	Prep Date: 07/25/2014	Run No: 272411							
SampleType: MBLK	TestCode: TOTAL MERCURY SW7471B	BatchID: 194080	Analysis Date: 07/25/2014	Seq No: 5749389							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Mercury BRL 0.100

Sample ID: LCS-194080	Client ID:	Units: mg/Kg	Prep Date: 07/25/2014	Run No: 272411							
SampleType: LCS	TestCode: TOTAL MERCURY SW7471B	BatchID: 194080	Analysis Date: 07/25/2014	Seq No: 5749435							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Mercury 0.3803 0.100 0.4000 95.1 80 120

Sample ID: 1407K06-002BMS	Client ID:	Units: mg/Kg-dry	Prep Date: 07/25/2014	Run No: 272411							
SampleType: MS	TestCode: TOTAL MERCURY SW7471B	BatchID: 194080	Analysis Date: 07/25/2014	Seq No: 5749437							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Mercury 0.4696 0.122 0.4876 0.01044 94.2 70 130

Sample ID: 1407K06-002BMSD	Client ID:	Units: mg/Kg-dry	Prep Date: 07/25/2014	Run No: 272411							
SampleType: MSD	TestCode: TOTAL MERCURY SW7471B	BatchID: 194080	Analysis Date: 07/25/2014	Seq No: 5749438							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Mercury 0.4699 0.122 0.4876 0.01044 94.2 70 130 0.4696 0.062 30

Qualifiers: > Greater than Result value < Less than Result value B Analyte detected in the associated method blank
 BRL Below reporting limit E Estimated (value above quantitation range) H Holding times for preparation or analysis exceeded
 J Estimated value detected below Reporting Limit N Analyte not NELAC certified R RPD outside limits due to matrix
 Rpt Lim Reporting Limit S Spike Recovery outside limits due to matrix

Client: Environmental Planning Specialists, Inc.
Project Name: Drexel Chemical Company
Workorder: 1407K34

ANALYTICAL QC SUMMARY REPORT

BatchID: 194090

Sample ID: MB-194090	Client ID:	Units: ug/Kg	Prep Date: 07/25/2014	Run No: 272537							
SampleType: MBLK	TestCode: CHLORINATED PESTICIDES SW8081B	BatchID: 194090	Analysis Date: 07/28/2014	Seq No: 5751617							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

4,4'-DDD	BRL	3.33									
4,4'-DDE	BRL	3.33									
4,4'-DDT	BRL	3.33									
Aldrin	BRL	1.67									
alpha-BHC	BRL	1.67									
alpha-Chlordane	BRL	1.67									
beta-BHC	BRL	1.67									
Chlordane	BRL	33									
delta-BHC	BRL	1.7									
Dieldrin	BRL	3.3									
Endosulfan I	BRL	1.7									
Endosulfan II	BRL	3.3									
Endosulfan sulfate	BRL	3.3									
Endrin	BRL	3.3									
Endrin aldehyde	BRL	3.3									
Endrin ketone	BRL	3.3									
gamma-BHC	BRL	1.7									
gamma-Chlordane	BRL	1.7									
Heptachlor	BRL	1.7									
Heptachlor epoxide	BRL	1.7									
Methoxychlor	BRL	17									
Toxaphene	BRL	170									
Surr: Decachlorobiphenyl	14.05	0	16.67		84.3	25.2	120				
Surr: Tetrachloro-m-xylene	12.48	0	16.67		74.9	30.5	120				

Qualifiers:	>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
	BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Drexel Chemical Company
Workorder: 1407K34

ANALYTICAL QC SUMMARY REPORT

BatchID: 194090

Sample ID: LCS-194090	Client ID:	Units: ug/Kg	Prep Date: 07/25/2014	Run No: 272537							
SampleType: LCS	TestCode: CHLORINATED PESTICIDES SW8081B	BatchID: 194090	Analysis Date: 07/28/2014	Seq No: 5751620							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

4,4'-DDT	31.64	3.33	33.33		94.9	44.7	136				
Aldrin	31.86	1.67	33.33		95.6	41.5	118				
Dieldrin	28.92	3.33	33.33		86.8	44.3	133				
Endrin	25.76	3.33	33.33		77.3	43.2	137				
gamma-BHC	28.44	1.67	33.33		85.3	40.3	126				
Heptachlor	27.92	1.67	33.33		83.8	40.1	126				
Surr: Decachlorobiphenyl	14.60	0	16.67		87.6	25.2	120				
Surr: Tetrachloro-m-xylene	11.64	0	16.67		69.8	30.5	120				

Sample ID: 1407K06-002BMS	Client ID:	Units: ug/Kg-dry	Prep Date: 07/25/2014	Run No: 272537							
SampleType: MS	TestCode: CHLORINATED PESTICIDES SW8081B	BatchID: 194090	Analysis Date: 07/28/2014	Seq No: 5751632							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

4,4'-DDT	45.05	4.1	41.28		109	33.6	126				
Aldrin	42.89	2.1	41.28		104	32.6	120				
Dieldrin	37.53	4.1	41.28		90.9	35.1	124				
Endrin	42.53	4.1	41.28		103	39.7	129				
gamma-BHC	37.97	2.1	41.28		92.0	35.2	120				
Heptachlor	39.41	2.1	41.28		95.5	34.9	119				
Surr: Decachlorobiphenyl	18.56	0	20.65		89.9	25.2	120				
Surr: Tetrachloro-m-xylene	15.08	0	20.65		73.1	30.5	120				

Sample ID: 1407K06-002BMSD	Client ID:	Units: ug/Kg-dry	Prep Date: 07/25/2014	Run No: 272537							
SampleType: MSD	TestCode: CHLORINATED PESTICIDES SW8081B	BatchID: 194090	Analysis Date: 07/28/2014	Seq No: 5751635							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

4,4'-DDT	49.79	4.1	41.28		121	33.6	126	45.05	10.0	28.1	
Aldrin	50.73	2.1	41.28		123	32.6	120	42.89	16.7	29.9	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Drexel Chemical Company
Workorder: 1407K34

ANALYTICAL QC SUMMARY REPORT

BatchID: 194090

Sample ID: 1407K06-002BMSD	Client ID:	Units: ug/Kg-dry	Prep Date: 07/25/2014	Run No: 272537
SampleType: MSD	TestCode: CHLORINATED PESTICIDES SW8081B	BatchID: 194090	Analysis Date: 07/28/2014	Seq No: 5751635

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Dieldrin	42.85	4.1	41.28		104	35.1	124	37.53	13.2	26.6	
Endrin	47.30	4.1	41.28		115	39.7	129	42.53	10.6	27.6	
gamma-BHC	44.98	2.1	41.28		109	35.2	120	37.97	16.9	28.6	
Heptachlor	48.47	2.1	41.28		117	34.9	119	39.41	20.6	27.7	
Surr: Decachlorobiphenyl	21.11	0	20.65		102	25.2	120	18.56	0	30	
Surr: Tetrachloro-m-xylene	19.17	0	20.65		92.8	30.5	120	15.08	0	30	

Qualifiers:	>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
	BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		