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October 18, 2010

Mr. Scott Miller
Remedial Project Manager
U.S. Environmental Protection Agency, Region IV
4WD-SRTMB
61 Forsyth Street
Atlanta, GA 30303-3415

RE: 2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/ Koppers Superfund Site
Gainesville, Florida

Dear Mr. Miller:

On behalf of Beazer East, Inc. (Beazer), enclosed are three copies of the 2010 First Semiannual Comprehensive Groundwater Monitoring Report for the above-referenced site.

If you should have any questions regarding this correspondence, please do not hesitate to contact Mr. Mitchell Brourman, Beazer Environmental Manager, at (412) 208-8805 or Ms. Angie Gatchie of Field & Technical Services LLC (FTS) at 412-429-2694.

Sincerely,

Field & Technical Services LLC

Angela Gatchie

Angie Gatchie
Project Scientist

Attachments

cc: W. O'Steen, U.S. EPA
J. Fankulewski, Koppers, Inc. (CD)
J. Erickson, GeoTrans, Inc.
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G. Council, GeoTrans, Inc. (CD)

2010 FIRST SEMIANNUAL COMPREHENSIVE GROUNDWATER MONITORING REPORT

CABOT CARBON / KOPPERS SUPERFUND SITE GAINESVILLE, FLORIDA

Submitted to:
U.S. EPA Region 4

On behalf of:
Beazer East, Inc.

Prepared by:

Field & Technical Services, LLC
200 Third Avenue
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October 18, 2010

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ABBREVIATIONS/ACRONYMS

Beazer	Beazer East, Inc.
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CGMSAP	Comprehensive Groundwater Monitoring and Sample Analysis Plan
COC	Chain of Custody
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
FTS	Field & Technical Services, LLC
GCTLs	Florida Groundwater Cleanup Target Levels
HG	Hawthorn Group
Koppers	Koppers Inc.
LNAPL	Light Non-Aqueous Phase Liquid
LTZ	Lower Transmissive Zone
MAGI	MOSDAX automated groundwater interface
MCL	Maximum Contaminant Level
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NAPL	Non-Aqueous Phase Liquid
ORP	Oxidation-Reduction Potential
PPE	Personal Protective Equipment
POTW	Publicly-Owned Treatment Works
QA	Quality Assurance
QC	Quality Control
Site	Cabot Carbon/Koppers Superfund Site, Gainesville, Florida
SOP	Standard Operating Procedure
SVOCs	Semi-volatile Organic Constituents
µg/l	Micrograms per Liter
U.S. EPA	United States Environmental Protection Agency
UTZ	Upper Transmissive Zone
VOCs	Volatile Organic Constituents
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

On behalf of Beazer East, Inc. (Beazer), Field & Technical Services, LLC (FTS) is pleased to submit the 2010 First Semiannual Comprehensive Groundwater Monitoring Report for the Cabot Carbon/Koppers Superfund Site in Gainesville, Florida (Site) (Figure 1). This report is the second comprehensive groundwater monitoring report to be submitted to the United States Environmental Protection Agency (U.S. EPA). U.S. EPA one-time approvals of the *Comprehensive Groundwater Monitoring and Sample Analysis Plan*[1] (CGMSAP) for the groundwater sampling events the weeks of February 1, 2010 and May 24, 2010 were received via email on January 15, 2010[2] and May 17, 2010[3], respectively. The U.S. EPA conditionally approved[4] the CGMSAP[5] which was submitted final to the U.S. EPA on August 4, 2010. The purpose of the CGMSAP is to combine the current groundwater monitoring efforts into a unified Site-wide program thereby enhancing the efficiency of data collection and the quality of the data obtained for understanding Site-wide groundwater conditions. The CGMSAP has replaced the previous Surficial Aquifer, Hawthorn Group (HG), and Floridan Aquifer monitoring programs at the Site.

This report presents the Site-wide monitoring activities which occurred during the first semiannual period of 2010 (January 1, 2010 through June 30, 2010).

1 FTS, September 18, 2009, *Comprehensive Groundwater Monitoring and Sample Analysis Plan*, Cabot Carbon/Koppers Superfund Site, Gainesville, Florida, submitted to U.S. EPA

2 U.S. EPA, January 15, 2010, *CGMSAP One-Time Sampling Event Approval*, Email to Greg Council, GeoTrans.

3 U.S. EPA, May 17, 2010, *CGMSAP One-Time Sampling Event Approval*, Email to Greg Council, GeoTrans.

4 U.S. EPA, June 19, 2010, *May 7, 2010 Response to Comments and Final CGMSAP Submittal*, Letter to Karen Fromme, FTS.

5 FTS, August 4, 2010, *Comprehensive Groundwater Monitoring and Sample Analysis Plan*, Cabot Carbon/Koppers Superfund Site, Gainesville, Florida, submitted to U.S. EPA

2.0 MONITORING ACTIVITIES

Field activities associated with the first quarter 2010 were conducted January 11 and 12, 2010, February 1 through 4, 2010, March 3, 2010, and March 15 and 16, 2010. Field activities associated with the second quarter 2010 were conducted May 24 through 27, 2010 and June 22 through 24, 2010. Monitoring activities and methods used for the implementation of the CGMSAP are discussed in the following sections. Figure 2 depicts the locations of the monitoring wells sampled during the reporting period.

2.1 MONITORING PROCEDURES

The following summary describes the general methods employed to conduct water-level measurements, non-aqueous phase liquid (NAPL) measurements, and groundwater sampling during the first and second quarter 2010:

- Water levels were measured with a water-level meter and interface probe before groundwater sampling commenced in accordance with FTS Standard Operation Procedure (SOP) #116 and the CGMSAP. The depths to the bottom of the wells were also measured to monitor the potential accumulation of silt or sand in the wells. All monitoring wells were allowed to equilibrate to atmospheric pressure prior to gauging. The thickness of accumulated NAPL (if present) was also measured prior to purging and sampling. Gauging order was generally based on available historical analytical data. Monitoring wells were gauged in order of increasing impact. This procedure was followed to minimize any potential for cross contamination between wells;
- Groundwater potentiometric surface elevation data for the multi-port wells were measured using the Westbay sampling tool equipped with an integral pressure transducer as described in the CGMSAP. Using the sampling tool, an ambient atmospheric pressure reading was taken at each sample location on each day of sampling. The sampling tool is then lowered down-hole to engage the desired discrete interval sampling port and a pore pressure was measured;
- Low-flow sampling procedures were implemented during the purging and sampling of the monitoring wells in accordance with FTS SOP #157 and the CGMSAP (except for the Floridan multi-port wells and the Floridan Aquifer sentinel wells FW-25B, FW-25C, FW-26B, FW-26C, FW-29B, and FW-29C, see below). Monitoring wells were purged using either a peristaltic pump and dedicated Teflon®-lined tubing or a QED bladder equipped with disposable Teflon® bladders and dedicated Teflon®-lined tubing. Flow rates were determined using a graduated cylinder;

- Groundwater sampling of the multi-port wells was conducted via the use of the Westbay sampling tool (Westbay MP Sampling System) and in accordance with the CGMSAP.
- Traditional three to five well-volume purge sampling procedures were implemented during the purging and sampling of the Floridan Aquifer sentinel wells FW-25B, FW-25C, FW-26B, FW-26C, FW-29B, and FW-29C. Monitoring wells were purged using a Grundfos Redi Flo-2 pump equipped with ½" LDPE tubing. The purge volume was measured by calculating flow rate over time with a graduated 5-gallon bucket;
- Water-quality parameters were measured with a YSI-556 water-quality meter and a LaMotte-2020e or a HACH 2100P turbidity meter, which were field calibrated daily using manufacturer-supplied standard solutions. Field parameters were measured approximately every 5 minutes during low-flow sampling procedures and included: pH, specific conductivity, temperature, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity. Field parameters measured during traditional sampling procedures were collected and included: pH, specific conductivity, temperature, and turbidity. The multi-port sampling equipment is not designed for flow-through cell application. Therefore, groundwater field parameters were not collected at the multi-port wells;
- Sampling was initiated after field parameters stabilized. Samples were collected either directly from the Teflon®-lined tubing after the YSI-556 and its flow-thru cell were removed or with a Teflon® bailer. The groundwater samples were collected according to volatility (volatile samples first, semi-volatile samples second,and inorganic samples last). Dissolved metals were filtered through a 0.45-micrometer filter immediately upon sample collection;
- Decontamination of sampling equipment was performed between well locations utilizing Alconox solution and DI water rinses as specified in FTS SOP # 104;
- Laboratory-supplied bottles were filled, labeled, placed in a cooler with ice, and transported under chain-of-custody procedures, to Columbia Analytical Services, Inc. of Jacksonville, Florida for analysis; and,
- Purged groundwater was temporarily placed in 5-gallon buckets or the FTS 1200-gallon water transport trailer and transferred to the on-Site waste water treatment plant (WWTP) for treatment and subsequent discharge to the publicly-owned treatment works (POTW). Personal protective equipment (PPE) was collected in a 55-gallon drum for future disposal at an off-site licensed facility.

Groundwater quality measurements, calculations, and field notes were recorded for each monitoring well and are provided in Appendix A. Copies of the chain of custody (COC) forms are included with the laboratory analytical data reports in Appendix B.

2.2 SURFICIAL AQUIFER

Surficial Aquifer monitoring consists of sampling wells in the immediate vicinity of the eastern and northern Site property boundaries. Thirteen Surficial Aquifer wells are used to monitor groundwater quality in the vicinity of these two property boundaries (Figure 2). The majority of the Surficial Aquifer monitoring wells are nested wells completed in the upper ("A" series monitoring wells) and lower ("B" series monitoring wells) portions of the Surficial Aquifer.

Eight Surficial Aquifer monitoring wells were sampled during the first quarter 2010 event ITW-22, M-09AR, M-09BR, M-16B, M-17, M-20B, M-23BR, and M-25B. Four Surficial Aquifer monitoring wells were sampled during the second quarter 2010 event M-12, M-16A, M-17, and M-33B. ITW-12 and M-3BR were not sampled during the first semiannual 2010 sampling events as the sampling frequency is annual for these wells. The monitoring locations and sampling frequency for the Surficial Aquifer is provided in Table 1.

All Surficial Aquifer monitoring wells were sampled for a select list of for semi-volatile organic constituents (SVOCs) and benzene, ethylbenzene, toluene, and xylenes (BTEX) as presented in Table 5-3 of the CGMSAP. In addition, select wells were sampled for total and dissolved arsenic, total and dissolved chromium, and pentachlorophenol. Monitoring wells M-09AR, M-09BR, M-12, M-16A, M-16B, M-17, M-20B, M-23BR, and M-25B were analyzed for total and dissolved arsenic. Monitoring well M-12 was analyzed for total and dissolved chromium during the first semiannual period of 2010. Monitoring wells M-12, M-16A, M-16B, M-17, M-20B, M-23BR, and M-25B were analyzed for pentachlorophenol.

2.3 HAWTHORN GROUP

HG monitoring primarily focuses on documenting that groundwater impacts remain on Site and that off-Site impacts to groundwater are stable and/or attenuating. As such, HG monitoring focuses on wells located along the eastern and western property boundaries and downgradient of these boundaries. A total of 24 HG monitoring wells are used to monitor groundwater quality in the vicinity of these two property boundaries (Figure 2).

A total of 14 HG monitoring wells were sampled during the first and second quarter 2010 events. Ten HG monitoring wells were sampled along the eastern property boundary and four wells were sampled along the western property boundary. The monitoring locations and sampling frequency for the HG is provided in Table 2. Monitoring wells HG-28S

and HG-28D were not gauged or sampled. The CGMSAP is being revised to remove these wells from the program and is included as Appendix D.

The list of analytes for the HG monitoring wells is tailored to the known constituent distributions established from the comprehensive sampling performed in December 2007. All HG monitoring wells were sampled for select SVOCs and BTEX as presented in Table 5-4 of the CGMSAP.

2.4 FLORIDAN AQUIFER

The Floridan Aquifer monitoring focuses on wells located downgradient and within suspected source area locations. The Floridan Aquifer monitoring wells are completed in the Upper Transmissive Zone (UTZ) and Lower Transmissive Zone (LTZ). The UTZ wells consist of both standard-construction monitoring wells and multiple-screen, multi-port sampling wells. The multi-port wells were installed to provide vertically discrete sampling within the Floridan Aquifer. Floridan wells FW-27B, FW-28B, FW-30B, FW-29B and FW-29C were installed during the first semiannual period of 2010.

Nine Floridan Aquifer monitoring wells were sampled during the first quarter 2010 event and eleven Floridan Aquifer monitoring wells were sampled during the second quarter 2010 event (Figure 2). The monitoring locations and sampling frequency for the Floridan Aquifer wells is provided in Table 3.

Select Floridan Aquifer monitoring wells (FW-6, FW-12B, FW-16B, FW-20B, and FW-21B) were sampled as part of the Floridan Interim Measures sampling program which was conducted on January 11 and 12, 2010 for the first quarter 2010. Please note that Floridan Aquifer monitoring wells FW-6 and FW-21B could not be gauged during the first quarter 2010 due to dedicated pumping equipment installed in these wells.

Floridan Aquifer monitoring well FW-23C could not be sampled during the February 2010 sampling event due to access issues associated with the on-going well installation work. FW-23C was sampled during the first quarter 2010 on March 3, 2010.

Floridan Aquifer monitoring well FW-28B was not installed at the time of the February 2010 sampling event; however, this well was completed by the end of the first quarter 2010 and was sampled on March 15 and 16, 2010.

Floridan Aquifer monitoring wells FW-22B, FW-24B, FW-27B, and FW-28B were not sampled during the May 2010 sampling event due to down-hole transducers in those wells during the time of sampling. After the data was collected and the transducers were removed, these wells were then sampled during the second quarter 2010 from June 22 through 24, 2010.

The list of analytes for the Floridan Aquifer monitoring wells is tailored to the known constituent distributions established from the quarterly sampling in these wells, which has been on-going since 2006. All Floridan Aquifer monitoring wells were sampled for select SVOCs and BTEX as indicated in Table 5-6 of the CGMSAP. The sentinel wells (FW-25B, FW-25C, FW-26B, FW-26C, FW-29B, and FW-29C) were also sampled for total and dissolved arsenic.

2.5 QUALITY ASSURANCE

Quality assurance/quality control (QA/QC) samples collected during the first and second quarter 2010 events included trip blanks, field blanks, equipment rinsate blanks, filter blanks, field duplicates, and Site-specific matrix spike/matrix spike duplicate (MS/MSD) samples in accordance with the CGMSAP. Trip blanks were included in each cooler submitted to the laboratory containing volatile organic constituents (VOCs). Field blanks and equipment rinsate blanks were collected at a rate of one blank per day per sampling event. Field duplicate samples collected during the first quarter 2010 include: Surficial Aquifer monitoring well M-25B (M-99E-020410), HG monitoring wells HG-24S (M-99B-020210) and HG-29S (HG-99D-020410), and Floridan Aquifer monitoring wells FW-24C Zone 1 (M-99A-020110) and FW-26C (FW-99C-020310). Field duplicate samples collected during the second quarter 2010 include: Surficial Aquifer monitoring well M-12 (M-99A-052610), HG monitoring wells HG-23D (HG-99A-052510) and HG-20S (HG-99B-052510), and Floridan Aquifer monitoring wells FW-26B (FW-99A-052610), FW-21B Zone 2 (Dup-01-052710), and FW-30B Zone 2 (FW-99G-052710). Field duplicate samples collected during the June 2010 event include: Floridan Aquifer monitoring wells FW-24B Zone 2 (FW-99-062210) and FW-27B Zone 5 (FW-99-062410). MS/MSD samples collected during the first quarter 2010 include: Surficial Aquifer monitoring well M-17, HG monitoring well HG-29D, and Floridan Aquifer monitoring well FW-25B. MS/MSD samples collected during the second quarter 2010 include: Surficial Aquifer monitoring well M-16A and Floridan Aquifer monitoring well FW-25C. MS/MSD samples were collected during the June 2010 event from Floridan Aquifer monitoring well FW-22B and FW-24B.

FTS completed a QA review of the field and technical data at two levels as described in the CGMSAP. For the first level, data was reviewed at the time of collection by following standard procedures and QC checks. For the second level, after data reduction to table format or arrays, the data was reviewed for anomalous values. Any inconsistencies or anomalies identified during this review were immediately resolved, if possible, by seeking clarification from the field personnel responsible for collecting the data.

Upon receipt of the analytical data from Columbia Analytical Services, Inc, Environmental Standards validated the data, using the protocols of the U.S. EPA National

Functional Guidelines (U.S. EPA 2004[6], 2008[7], and 2002[8]) and U.S. EPA method specifications. Environmental Standards found the majority of the data acceptable with the summarized qualifications listed in Appendix B. Appendix B also contains the data validations and analytical reports. Appendix C contains the analytical data tables in Microsoft Excel format.

2.6 MONITORING WELL INSPECTION

Monitoring well inspections were completed on February 1, 2010 and May 24, 2010. The FTS field crew documented observed defects or maintenance activities associated with the monitoring wells included in the first and second quarter 2010 events (Appendix A), and performed (as required) general well repairs such as lock replacement, cap replacement, and well identification re-labeling. The majority of the well defects observed during the first quarter 2010 well inspection were repaired by the second quarter 2010 event. The following well defects were observed during the second quarter 2010 well inspection:

- HG monitoring well HG-26D had a cracked pad;
- HG monitoring wells HG-22D, HG-23D, HG-25D, HG-26S, and HG-26D were missing some bolts in the traffic-rated covers;

All of the aforementioned defects were repaired in June 2010.

2.7 DEVIATIONS FROM THE CGMSAP

The following deviations from the approved CGMSAP occurred during the reporting period:

- HG monitoring wells HG-28S and HG-28D were not sampled during the First or Second Quarter 2010. In addition, Floridan Aquifer monitoring wells FW-27B, FW-29B, FW-29C, and FW-30B were not sampled during the First Quarter 2010 because they were not installed at the time of the sampling events;

[6] U.S. EPA, October 2004. *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*.
[7] U.S. EPA, June 2008. *U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*.
[8] U.S. EPA, January 2009. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use*.

- Floridan Aquifer monitoring wells FW-6 and FW-21B were not gauged during the January 2010 sampling event due to dedicated pumping equipment installed in these wells;
- Surficial Aquifer monitoring well M-16A was not sampled during the First Quarter 2010 since this well was not part of the sampling program at the time of the sampling event as presented in the September 18, 2009 CGMSAP;
- Floridan Aquifer monitoring wells FW-23B and FW-24B were not sampled during the First Quarter 2010 because the sampling frequency of these wells at the time of the sampling event was on an annual basis;
- The total and dissolved arsenic sample was inadvertently missed from Floridan Aquifer monitoring well FW-28B during the First Quarter 2010; and,
- Total and dissolved arsenic was not collected from Floridan Aquifer monitoring well FW-30B during the Second Quarter 2010; arsenic was added to the CGMSAP requirements after the May 2010 event was performed.

3.0 MONITORING RESULTS

The non-aqueous phase liquids (NAPLs) monitoring, groundwater flow and water quality results for the Surficial Aquifer, HG deposits, and Floridan Aquifer are discussed in the following sections.

3.1 NON-AQUEOUS PHASE LIQUIDS

Non-aqueous phase liquids were not detected in any of the Surficial Aquifer, HG, or Floridan Aquifer monitoring wells during the first and second quarter 2010 monitoring events (Table 4a and Table 4b). The absence of NAPLs in the 39 monitoring wells in the CGMSAP program is consistent with historical measurements for these wells. The only wells at the Site that currently contain DNAPL are five Upper Hawthorn wells located in the former North Lagoon, Drip Track Area, and Process Area. These five DNAPL wells are not part of the CGMSAP program and are monitored bi-monthly as part of the DNAPL Interim Remedial Measures (IRM) recovery program at the Site.

3.2 GROUNDWATER FLOW

Groundwater potentiometric elevations were obtained in 35 monitoring well locations during the first quarter 2010 (Table 4a) and in 39 monitoring well locations during the second quarter 2010 (Table 4b). The groundwater potentiometric elevations for the monitoring wells were used in addition to performance monitoring well data from the IRM programs to construct the groundwater potentiometric surface contour maps for the first quarter (Figures 3a, 3b, 3c, and 3d) and for the second quarter 2010 (Figures 4a, 4b, 4c, and 4d). The following subsections discuss the first and second quarter 2010 groundwater flow observations in the Surficial, Upper Hawthorn, Lower Hawthorn, and Floridan Aquifers.

3.2.1 Surficial Aquifer

Surficial Aquifer groundwater flow at the Site is primarily controlled by the hydraulic containment system designed to capture impacted groundwater at the Site. The newly enhanced hydraulic containment system for the Surficial Aquifer was operational during the first and second quarters 2010. Recovery wells along the eastern and northern property boundary continued to capture impacted groundwater along with the recently installed horizontal trench/drain recovery system in the immediate vicinity of the four former source areas. Total combined groundwater recovery from the well/drain system during fourth quarter 2009 was approximately 54 gpm.

The principal direction for groundwater flow in the Surficial Aquifer is to the northeast; however, groundwater is being captured locally by the hydraulic-containment system in continuous operation at the Site (Figures 3a and 4a). The hydraulic gradient varies from

a low gradient across the southern three quarters of the Site to a significantly higher gradient on the northern one quarter of the Site. The average hydraulic gradient across the southern three quarters of the Site is approximately 0.003 ft/ft, whereas the average hydraulic gradient across the northern quarter of the Site is approximately 0.01 ft/ft. This increase in the hydraulic gradient from the southern to the northern area of the Site is likely due to a combination of factors including: 1) A decrease in the Surficial Aquifer transmissivity (hydraulic conductivity times aquifer thickness) in the northern area of the Site and 2) A lowering of the water table by the hydraulic-containment system groundwater recovery in this area. Groundwater flow directions and hydraulic gradients for the first and second quarter 2010 events were consistent with historical site conditions.

3.2.2 Hawthorn Group Deposits

The HG deposits contain three primary low-permeability clay deposits termed the upper clay, middle clay and lower clay units. Sedimentary deposits between the upper and middle clay units are referred to as the Upper Hawthorn and sedimentary deposits between the middle and lower clay units are referred to as the Lower Hawthorn. Groundwater flow directions for the Upper Hawthorn are distinct from flow directions in the Lower Hawthorn and therefore, will be discussed separately in this section.

Upper Hawthorn

Groundwater flow in the Upper Hawthorn closely mimics the flow direction in the Surficial Aquifer, with a primarily northeastern flow direction across the Site (Figures 3b and 4b). The low-permeability upper clay unit restricts downward vertical flow resulting in approximately 2 to 3 feet hydraulic-head difference across this clay unit. However, the similar northeasterly groundwater flow direction in the Upper Hawthorn and Surficial Aquifer is an indication that hydraulic communication is occurring between these two hydrologic units such that the overall groundwater flow directions are the same. Similar to the hydraulic gradient in the Surficial Aquifer, the hydraulic gradient for the Upper Hawthorn increases from south to north across the Site; however the magnitude of change is not as large.

Lower Hawthorn

Groundwater flow in the Lower Hawthorn is significantly impacted by the approximately 5 to 20-foot thick low-permeability middle clay unit. The hydraulic-head difference across this clay is approximately 30 to 35 feet, indicating that the middle clay unit significantly restricts vertical groundwater flow from the Upper Hawthorn to the Lower Hawthorn. The groundwater flow direction within the Lower Hawthorn is considerably different than the flow direction in the Upper Hawthorn. Monitoring well data from the Lower Hawthorn indicate the presence of a groundwater divide approximately extending

from the southeastern corner of the Site to northwestern corner (Figures 3c and 4c). This groundwater divide results in northerly to northeasterly groundwater flow direction for the eastern half of the Site and a westerly to northwesterly flow direction for the western half of the Site. This groundwater divide approximately correlates with locations on the Site where the middle clay unit is thinnest (approximately 5 to 10 feet thick). These are also the same areas where the hydraulic-head difference between the Upper and Lower Hawthorn is the least (approximately 30 feet). Areas of the Site where the middle clay unit are the thickest (approximately 15 to 20 feet thick) correspond to areas where the hydraulic-head difference between these two units are also the greatest (more than 35 feet).

The hydraulic gradient is slightly less on the eastern portion of the Site versus the gradient on the western portion of the Site. This change in hydraulic gradient is likely due to a reduction in transmissivity for Lower Hawthorn deposits on the western half of the Site.

The potentiometric surface elevation for monitoring well HG-22D is approximately 6 to 7 feet higher than surrounding monitoring wells. The higher potentiometric surface elevation in this area may be due to the well completion in the upper portion of the Lower Hawthorn or increased hydraulic communication between the Upper Hawthorn and Lower Hawthorn in this area.

These data support the conceptual model of significantly restricted groundwater flow and hydraulic communication between the Upper and Lower Hawthorn across the entire Site. The approximately 30-foot of hydraulic-head difference in areas where the middle clay unit is projected to be the thinnest, supports this conceptual model.

3.2.3 Floridan Aquifer

Groundwater flow in the Floridan Aquifer is primarily controlled by groundwater withdrawals at the Murphree Wellfield. The Site is located within the large groundwater capture area that has developed from over 42 years of pumping at this wellfield. Because of groundwater withdrawals at the Murphree Wellfield, the average groundwater flow direction at the Site is to the northeast. Monitoring well data at the Site also indicate a localized northern to northwestern groundwater flow direction on the western portion of the Site (Figures 3d and 4d). This flow direction has recently been correlated with groundwater impacts observed in monitoring well FW-22B. The groundwater flow direction on the eastern portion of the Site appears to be predominantly to the northeast, consistent with regional flow for this aquifer.

Six Floridan Aquifer wells were monitored during the first and second quarter 2010 events; four wells are completed in the Upper Transmissive Zone (UTZ) and two wells are completed in the Lower Transmissive Zone (LTZ). The average hydraulic gradient in

the Floridan Aquifer is relatively flat, with an average horizontal gradient of 0.00025 feet/feet. The Floridan Aquifer average groundwater flow direction at the Site is to the north and northeast. The hydraulic gradient across the site and groundwater flow direction measured in February and May 2010 are approximately consistent with those observed in previous events.

The vertical hydraulic gradient from the UTZ to the LTZ is generally downward at the Site. The three sentinel well UTZ and LTZ well pairs provide the best data for estimating the current vertical hydraulic gradient between the UTZ and LTZ. The vertical hydraulic gradient at the sentinel well locations indicate a slight upward hydraulic gradient at sentinel pairs FW-25B/FW-25C and FW-26B/FW-26C and an approximately flat hydraulic gradient at FW-29B/FW-29C (Tables 4a and 4b). The relatively low vertical hydraulic gradient between the UTZ and LTZ is likely a result of groundwater withdrawals at the Murphree Wellfield that are tending to reduce the vertical hydraulic gradient between these two units.

3.3 GROUNDWATER QUALITY

Groundwater samples were collected from 38 monitoring wells during the first quarter 2010 and from 33 monitoring wells during the second quarter 2010 in accordance with the CGMSAP. The following subsections discuss groundwater quality observations for the Surficial Aquifer, HG deposits, and Floridan Aquifer during the first and second quarter 2010.

3.3.1 Surficial Aquifer

Groundwater samples were collected from the eight Surficial Aquifer wells during the first quarter 2010 and four Surficial Aquifer wells during the second quarter 2010 (Figure 2). Table 5 presents a summary of the February and May 2010 analytical results. A graphical summary of organic and inorganic constituents that exceed the U.S. EPA Maximum Contaminant Level (MCLs) and the Florida GCTLs are provided for the Surficial Aquifer wells (Figures 5 and 6, respectively). The field forms, associated with the sampling of these wells during the February 2010 and May 2010 events, are included in Appendix A. The analytical laboratory results are included in Appendix B.

Surficial Aquifer wells M-12 and ITW-22 are located near the central portion of the eastern property boundary of the Site. No organic constituents exceeded groundwater standards in these wells.

Three Surficial Aquifer wells are located near the northeastern Site boundary (M-09AR, M-09BR, and M-33B). Upper Surficial Aquifer well M-09AR did not contain any constituents that exceeded standards. Lower Surficial Aquifer wells M-09BR and M-33B have select organic constituents that exceed Florida GCTLs.

Six Surficial Aquifer wells located along the southern half of eastern property boundary (M-16A, M-16B, M-17, M-20B, M-23BR, and M-25B) contained organic constituents that exceeded Florida GCTLs and U.S. EPA MCL standards.

Five Surficial Aquifer wells (M-16B, M-17, M-20B, M-23BR, and M-25B) contained pentachlorophenol that exceeded its Florida GCTL and U.S. EPA MCL.

Four Surficial Aquifer wells contained arsenic concentrations that exceeded the Florida GCTL and U.S. EPA MCL of 10 micrograms per liter (µg/L), as presented in Table 5 and Figure 6; M-16B, M-17, M-20B, and M-23BR.

The groundwater quality results for the Surficial Aquifer wells included in the CGMSAP represent groundwater impacts that are within the capture zone of the hydraulic-containment system perimeter wells. The elevated organic and inorganic concentrations represent impacted groundwater that is being pulled from on-Site sources into the groundwater capture system. Hence, elevated concentrations measured in these monitoring wells are not representative of groundwater quality flowing off-Site, but rather represent impacted groundwater being captured by the containment system. As groundwater capture at the horizontal trench/drain system becomes more effective, long-term concentrations at the property boundary wells should show a decreasing concentration trend.

3.3.2 Hawthorn Group

Groundwater samples were collected from 14 HG wells during the first and second quarter 2010 sampling events. Four of the monitoring wells are located along the western boundary of the Site and the remaining 10 wells are located along the eastern boundary of the Site (Figure 2). Tables 6a and 6b present summaries of the February and May 2010 Upper and Lower HG analytical results. A graphical summary of organic constituents that exceed the U.S. EPA MCLs and the Florida GCTLs is provided for the Upper and Lower HG wells (Figures 7a and 7b, respectively). The field forms, associated with the sampling of these wells during the February 2010 and May 2010 events, are included in Appendix A. The analytical laboratory results are included in Appendix B.

Off-Site monitoring wells located to the west of the Site consist of three Lower Hawthorn wells (HG-22D, HG-23D, and HG-25D) and one Upper Hawthorn well (HG-24S). All organic constituent concentrations for these wells were nondetect, consistent with results from previous sampling events at these wells.

Monitoring well pair HG-27S/D is located approximately 400 feet northeast off-Site. No organic constituents exceeded groundwater standards in the Upper or Lower Hawthorn wells, consistent with previous sampling events.

Monitoring well nests HG-21S/D, HG-20S/D and HG-26S/D are located approximately 200 to 300 feet off-Site to the east. Well pair HG-21S/D is located to the northeast of the Site. No organic constituents exceeded groundwater standards in the Upper Hawthorn well. However, the Lower Hawthorn well (HG-21D) contained benzene, ethylbenzene, xylenes, and 2,4-dimethyphenol concentrations that exceeded Florida GCTL standards during the first and second quarter 2010 sampling events. HG-21D also contained 3&4-methylphenol that exceeded Florida GCTL standards during the first quarter 2010 sampling event and naphthalene that exceeded GCTL standards during the second quarter 2010 sampling event. In addition, the benzene concentrations in this well during the first and second quarter 2010 sampling events (48 µg/L and 49 µg/L, respectively) exceeded the U.S. EPA MCL standard.

Monitoring well pair HG-20S/D is located off-Site to the east of the former drip track area. No organic constituents exceeded groundwater standards in the Lower Hawthorn well. Three organic constituents exceeded GCTLs in the Upper Hawthorn well during the first quarter 2010 sampling event (benzene, carbazole, and naphthalene), and four organic constituents exceeded GCTLs in HG-20S during the second quarter 2010 sampling event (benzene, acenaphthene, carbazole, and naphthalene).

Monitoring well pair HG-26S/D is located to the east on the former Cabot Carbon property. Both the Upper and Lower Hawthorn wells have select organic constituents that exceed the GCTL. During the first quarter 2010 sampling event the Upper Hawthorn well contained benzene (12 µg/L) and pentachlorophenol (1.4 J µg/L) which exceeded the U.S. EPA MCL; and during the second quarter 2010 sampling event HG-26S contained only benzene (11 µg/L) which exceeded the U.S. EPA MCL.

Monitoring well pair HG-29S/D is located downgradient of the former Cabot Carbon lagoons. Both the Upper and Lower Hawthorn wells have select organic constituents that exceed the Florida GCTL. The Upper and Lower Hawthorn wells also contained benzene concentrations from the first quarter 2010 sampling event (360 µg/L and 110 J µg/L) and from the second quarter 2010 sampling event (310 µg/L and 130 µg/L) which exceed the U.S. EPA MCL. The organic constituents detected in this well pair are consistent with previous sampling events that have correlated impacts in these wells with the former Cabot Carbon lagoons.

3.3.3 Floridan Aquifer

Groundwater samples were collected from 16 Floridan Aquifer wells during the first quarter 2010 and fifteen Floridan Aquifer wells were sampled during the second quarter 2010 (Figure 2). Table 7 presents a summary of the first and second quarter 2010 analytical results for the single-screened Floridan Aquifer monitoring wells. Summaries of the first and second quarter 2010 analytical results for the multi-screened, multi-port UTZ and LTZ Floridan Aquifer monitoring wells are presented in Tables 8a and 8b,

respectively. A graphical summary of organic and inorganic constituents that exceed the U.S. EPA Maximum Contaminant Level (MCLs) and the Florida Groundwater Cleanup Target Levels (GCTLs) are provided for the source area wells (Figure 8), transect wells (Figures 9 and 10), boundary wells (Figures 11 and 12), and sentinel wells (Figures 13 and 14). Figures 15 and 16 show a summary of the Floridan Aquifer organic and inorganic exceedances, respectively. The field forms, associated with the sampling of these wells, are included in Appendix A. The analytical laboratory results are included in Appendix B.

In the following paragraphs, groundwater quality results are discussed in more detail for the source, transect, boundary, and sentinel monitoring wells.

3.3.3.1 Source Area Monitoring Wells

UTZ Monitoring wells in the former North Lagoon (FW-6 and FW-20B) contained select organic constituents, with concentrations above Florida GCTL standards and above the USEPA MCL for benzene (Figure 8). Monitoring well FW-21B located in the former Drip Track area contained select organic constituents, with concentrations above Florida GCTL standards during the January 2010 sampling event.

The January 2010 sample collected from UTZ monitoring well FW-6 contained six organic constituents: benzene, 2-methylnaphthalene, acenaphthene, carbazole, dibenzofuran, and naphthalene that exceed Florida GCTL standards. The sample collected during the January 2010 sampling event also contained benzene that exceeds its respective U.S. EPA MCL.

The January and May 2010 samples collected from the upper two Zones (Zones 1 and 2) for monitoring well FW-20B contain select organic constituents that exceed Florida GCTL standards. The samples collected from upper Zone 1 during the January and May 2010 sampling events also contain benzene that exceeds its respective USEPA MCL. The two deeper zones (3 and 4) in this well historically have been nondetect and in accordance with the CGMSAP were not sampled during this reporting period but will be sampled during the annual event. The January and May 2010 samples collected from Zone 1 contained six organic constituents (benzene, 2-methylnaphthalene, acenaphthene, carbozole, dibenzofuran, and naphthalene) that exceed their respective Florida GCTL standards. The samples collected from Zone 1 during the reporting period contain benzene that exceeds its respective USEPA MCL. Zone 2 contained two organic constituents(acenaphthene and naphthalene) that exceeded their respective Florida GCTL standards during the January 2010 sampling event. Zone 2 contained three organic constituents(benzene, acenaphthene, and naphthalene) that exceeded their respective Florida GCTL standards during the May 2010 sampling event. The January and May 2010 sampling events results are generally consistent with previous sampling events.

Floridan well FW-21B has been converted from a multi-screened, multi-port well to a single-screened well and has dedicated pumping equipment installed inside it. This well was sampled as part of the Floridan Interim Measures sampling program which was conducted on January 11 and 12, 2010 for the first quarter 2010. The January 2010 sample collected from FW-21B contained three organic constituents(benzene, carbazole, and naphthalene) that exceed Florida GCTL standards.

3.3.3.2 Transect Monitoring Wells

Of the four UTZ transect wells sampled during the reporting period (FW-12B, FW-16B, FW-27B, and FW-30B), samples collected from FW-30B did not exceed the Florida GCTLs or the USEPA MCL standards; samples collected from FW-16B – Zone 1 contained select organic constituents that exceed the Florida GCTLs; and samples collected from two of the wells (FW-12B – Zone 3 and FW-27B – Zones 3 and 5 [duplicate sample only]) contained benzene that exceed the USEPA MCL standard and select organic constituents that exceed the Florida GCTLs (Table 8a and Figure 9).

Three of the four Zones (Zones 1, 3, and 4) for monitoring well FW-12B contain select organic constituents that exceed Florida GCTL standards. FW-12B - Zone 3 contains benzene that exceeds the USEPA MCL standard. The highest constituent impacts in FW-12B continue to be in the two lowest monitoring zones. The upper two monitoring zones contain constituent impacts, but at much lower concentrations. The constituent temporal trends for impacts in the two lower monitoring zones are consistent with the conceptual model of impacts infiltrating upgradient of this well location and migrating diagonally downward as they are transported to the north. In general, the organic constituent concentrations observed in monitoring well FW-12B during the reporting period were consistent with previous sampling event results.

Monitoring well FW-16B contained benzene and naphthalene concentrations in Zone 1 in excess of Florida GCTL standards during the January and May 2010 sampling events. The three deeper zones (2, 3, and 4) in this well historically have been nondetect and in accordance with the CGMSAP were not sampled during this reporting period, but will be sampled during the annual event. The January and May 2010 organic constituent concentrations in monitoring well FW-16B were similar with previous sampling events.

All zones (Zones 1, 2, 3, 4, 5, and 6) for monitoring well FW-27B contain select organic constituents that exceed Florida GCTL standards. FW-27B - Zone 3 and 5 (duplicate sample only) contain benzene that exceed the USEPA MCL standard. The June 2010 sampling event was the first sampling event for this well after installation. In Zone 1, benzene, acenaphthene, and naphthalene exceeded their respective Florida GCTL standards. Zones 2, 3, 4, 5 and 6 all contain six organic constituents(benzene, 2-methylnaphthalene, acenaphthene, carbazole, dibenzofuran, and naphthalene) that

exceed Florida GCTL standards. The sample collected from Zone 3 and the duplicate sample collected from Zone 5 contain benzene that exceeds its respective USEPA MCL.

3.3.3.3 Boundary Wells

As shown on Figures 11 and 12, all organic and inorganic constituents were below the USEPA MCLs and the Florida GCTLs in UTZ monitoring well FW-4, LTZ property boundary wells FW-4C, FW-22C, FW-23C, and FW-24C and in UTZ property boundary wells FW-23B, and FW-24B during the first and second quarter 2010. The one exception is that arsenic concentrations were elevated above Federal and State standards in Zones 1 and 2 in well FW-24B, which is consistent with previous sampling events.

Monitoring well FW-22B contained acenaphthene in Zone 3 and naphthalene in Zones 2 and 3 in excess of the Florida GCTL during the February 2010 sampling event; and acenaphthene and naphthalene in Zones 2 and 3 in excess of the Florida GCTL during the June 2010 sampling event. In general, the constituent concentrations in these zones are consistent with previous sampling events.

Monitoring well FW-28B contained phenol in Zone 1 in excess of the Florida GCTL during the March 2010 sampling event. The March 2010 sampling event was the first sampling event for this well after installation. Phenol results from Zone 2, 3, and 4 during the March 2010 sampling event and all four Zones during the June 2010 sampling event were nondetect for this well.

3.3.3.4 Sentinel Wells

Groundwater samples were collected from the six sentinel wells FW-25B, FW-25C, FW-26B, FW-26C, FW-29B, and FW-29C during the reporting period. The sentinel wells are below U.S. EPA MCLs and Florida GCTLs standards for all organic and inorganic constituents (Figures 13 and 14). The one exception is that total and dissolved arsenic concentrations (15 µg/L and 16 µg/L) were elevated above Federal and State standards in sentinel well FW-29B, consistent with the conceptual model of natural occurring arsenic mobilization due to the well installation.

4.0 SUMMARY AND CONCLUSIONS

4.1 HYDROGEOLOGY

The principal direction for groundwater flow in the Surficial Aquifer is to the northeast; however, on-Site groundwater is being captured by the hydraulic containment system that has been in continuous operation at the Site, since 1995. Groundwater flow directions and hydraulic gradients in the Surficial Aquifer are consistent with historical site conditions.

Similar to the Surficial Aquifer, the groundwater flow direction in the Upper Hawthorn is primarily to the northeast across the Site. Monitoring well data from the Lower Hawthorn indicate the presence of a groundwater divide approximately extending from the southeastern corner of the Site to northwestern corner. This groundwater divide results in northerly to northeasterly groundwater flow direction for the eastern half of the Site and a westerly to northwesterly flow direction for the western half of the Site which supports the conceptual site model.

Groundwater flow in the Floridan Aquifer is primarily controlled by groundwater withdrawals at the Murphree Wellfield. Because of groundwater withdrawals at the Murphree Wellfield, the average groundwater flow direction at the Site is to the northeast. Monitoring well data at the Site also indicate a localized northern to northwestern groundwater flow direction on the western portion of the Site. The groundwater flow direction on the eastern portion of the Site appears to be predominantly to the northeast, consistent with regional flow for this aquifer.

4.2 NAPL MOBILITY

LNAPL and DNAPL were not detected in any of the Surficial Aquifer, HG or Floridan Aquifer monitoring wells during the first and second quarter 2010 sampling events. The absence of NAPL is consistent with historical measurements for these wells.

4.3 GROUNDWATER QUALITY

Groundwater quality observed during the first and second quarter 2010 sampling events in the Surficial Aquifer, HG, and Floridan Aquifer monitoring wells was generally consistent with previous sampling events.

Recently installed wells in the northwestern area of the Site demonstrate that dissolved-phase Site constituents are not wide-spread in the Floridan Aquifer. Organic constituents were not detected along the northern property boundary, with the exception of one sample with low phenol concentrations, or in the off-Site sentinel wells. Well FW-27B was the only new monitoring well with dissolved-phase impacts; the four other new

monitoring wells were nondetect for organic constituents. The dissolved-phase impacts observed in FW-27B are consistent with historical impacts observed in upgradient wells located within the plume footprint. The width of the plume is fairly small and well defined by existing monitoring wells; however, impacts were observed in the lowest monitoring zone in FW-27B completed approximately 50 feet into the semi-confining unit. No free-phase or residual DNAPL impacts were detected in continuous geologic core collected in the UF Aquifer at any of the new well locations.

The quarterly sampling requirements for off-Site HG wells (HG-20S, HG-20D, HG-21S, HG-21D, HG-22D, HG-23D, HG-24S, HG-25D, HG-26S, HG-26D, HG-27S, HG-27D, HG-29S, and HG-29D) have been completed. These wells will be sampled on a semiannual basis starting in the second semiannual period of 2010.

The quarterly sampling requirements for Floridan Aquifer wells: FW-25B, FW-25C, FW-26B, and FW-26C have been completed and these wells will be sampled on a semiannual basis starting in the second semiannual period of 2010.

TABLES

Table 1
Surficial Aquifer Wells and Monitoring Program Parameters
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Well ID	Monitoring Series	Parameters[2],[3]					Sampling Frequency[1]	Sampling Completed During the Reporting Period		Sampling to be Completed During the Next Reporting Period	
								First Quarter 2010	Second Quarter 2010	Third Quarter 2010	Fourth Quarter 2010
ITW-12	A	SVOCs	VOCs	--	--	--	Annual	--	--	X	--
ITW-22	A	SVOCs	VOCs	--	--	--	SA (4 events) then annual	X	--	X	--
M-3BR	B	SVOCs	VOCs	Arsenic (total and dissolved)	Chromium (total and dissolved)	Pentachlorophenol	Annual	--	--	X	--
M-9AR	A	SVOCs	VOCs	Arsenic (total and dissolved)	--	--	SA (4 events) then annual	X	--	X	--
M-9BR	B	SVOCs	VOCs	Arsenic (total and dissolved)	--	--	SA (4 events) then annual	X	--	X	--
M-12	A	SVOCs	VOCs	Arsenic (total and dissolved)	Chromium (total and dissolved)	Pentachlorophenol	SA (4 events) then annual	--	X	X	--
M-16A	A	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	QTR (4 events) / SA (2 events) / then Annual	--*	X	X	X
M-16B	B	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	SA (4 events) then annual	X	--	X	--
M-17	A	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	QTR (4 events) / SA (2 events) / then Annual	X	X	X	--
M-20B	B	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	SA (4 events) then annual	X	--	X	--
M-23BR	B	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	SA (4 events) then annual	X	--	X	--
M-25B	B	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	SA (4 events) then annual	X	--	X	--
M-33B	B	SVOCs	VOCs	--	--	--	SA (4 events) then annual	--	X	X	--

Notes:

(1) "SA" indicates semiannual; "QTR" indicates quarterly.

(2) "SVOCs" indicates semivolatile organic compounds. The specific list of SVOCs included in the program is provided in Table 5-3.
Note that pentachlorophenol as listed on Table 5-3 will be analyzed for select samples.

(3) "VOCs" indicates volatile organic compounds. The specific list of VOCs included in the program is provided in Table 5-3.

* Location and quarterly frequency added to the May 2010 revisions to the CGMSAP.

Table 2
Hawthorn Group Wells and Monitoring Program Parameters
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Well ID	Parameters[2],[3]		Sampling Frequency[1]	Sampling Completed During the Reporting Period		Sampling to be Completed During the Next Reporting Period	
				First Quarter 2010	Second Quarter 2010	Third Quarter 2010	Fourth Quarter 2010
HG-2D	SVOCs	VOCs	Annual	--	--	X	--
HG-4S	SVOCs	VOCs	Annual	--	--	X	--
HG-4D	SVOCs	VOCs	Annual	--	--	X	--
HG-5D	SVOCs	VOCs	Annual	--	--	X	--
HG-6S	SVOCs	VOCs	Annual	--	--	X	--
HG-6D	SVOCs	VOCs	Annual	--	--	X	--
HG-10D	SVOCs	VOCs	Annual	--	--	X	--
HG-12D	SVOCs	VOCs	Annual	--	--	X	--
HG-16D	SVOCs	VOCs	Annual	--	--	X	--
HG-16S	SVOCs	VOCs	Annual	--	--	X	--
HG-20S	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-20D	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-21S	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-21D	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-22D	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-23D	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-24S	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-25D	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-26S	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-26D	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-27S	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-27D	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-28S*	--	--	--	--	--	--	--
HG-28D*	--	--	--	--	--	--	--
HG-29S	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X
HG-29D	SVOCs	VOCs	QTR (4 events)[4] / SA (2 events) / then annual	X	X	--	X

Notes:

(1) "QTR" indicates quarterly; "SA" indicates semiannual.

(2) "SVOCs" indicates semivolatile organic compounds. The specific list of SVOCs included in the program is provided in Table 5-4.

(3) "VOCs" indicates volatile organic compounds. The specific list of VOCs included in the program is provided in Table 5-4.

* Locations HG-28S and HG-28D are no longer a part of the Hawthorn Group Deposits Monitoring Program and have been removed from the CGMSAP.

(4) As of the Second Quarter 2010, the quarterly sampling requirements have been completed and these wells will be sampled on a semiannual basis starting in the second semiannual period of 2010.

Table 3
Floridan Aquifer Wells and Monitoring Program Parameters
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Well ID	Parameters(2),(3)			Site Location	Westbay Zones	Sampling Frequency[1]	Sampling Completed During the Reporting Period		Sampling to be Completed During the Next Reporting Period	
							First Quarter 2010	Second Quarter 2010	Third Quarter 2010	Fourth Quarter 2010
FW-3	SVOCs	VOCs	--	Boundary	n/a	Annual	--	--	X	--
FW-4	SVOCs	VOCs	--	Boundary	n/a	Semiannual	X	--	X	--
FW-4C	SVOCs	VOCs	--	Boundary	all	Semiannual	X	--	X	--
FW-6	SVOCs	VOCs	--	Source area	n/a	Semiannual	X	--	X	--
FW-10B	SVOCs	VOCs	--	Transect area	all	Annual	--	--	X	--
FW-11B	SVOCs	VOCs	--	Transect area	all	Annual	--	--	X	--
FW-12B	SVOCs	VOCs	--	Transect area	all	Quarterly	X	X	X	X
FW-13B	SVOCs	VOCs	--	Transect area	all	Annual	--	--	X	--
FW-14B	SVOCs	VOCs	--	Transect area	all	Annual	--	--	X	--
FW-15B	SVOCs	VOCs	--	Transect area	all	Annual	--	--	X	--
FW-16B	SVOCs	VOCs	--	Transect area	1	Quarterly	X	X	X	X
		VOCs	--		2, 3, 4	Annual	--	--	X	--
FW-17B	SVOCs	VOCs	--	Transect area	all	Annual	--	--	X	--
FW-18B	SVOCs	VOCs	--	Source area	all	Annual	--	--	X	--
FW-19B	SVOCs	VOCs	--	Source area	all	Annual	--	--	X	--
FW-20B	SVOCs	VOCs	--	Source area	1, 2	Quarterly	X	X	X	X
		VOCs	--		3, 4	Annual	--	--	X	--
FW-21B	SVOCs	VOCs	--	Source area	n/a	Semiannual	X	--	X	--
FW-22B	SVOCs	VOCs	--	Boundary	all	Quarterly	X	X	X	X
FW-22C	SVOCs	VOCs	--	Boundary	all	Semiannual	X	--	X	--
FW-23B	SVOCs	VOCs	--	Boundary	all	Quarterly	--*	X	X	X
FW-23C	SVOCs	VOCs	--	Boundary	all	Semiannual	X	--	X	--
FW-24B	SVOCs	VOCs	As (total and dissolved)	Boundary	all	Quarterly	--*	X	X	X
FW-24C	SVOCs	VOCs	As (total and dissolved)	Boundary	all	Semiannual/Annual[5]	X	--	X	--
FW-25B	SVOCs	VOCs	As (total and dissolved)[4,6]	Sentinel	n/a	QTR (4 events)[6] / SA (2 events) / then annual	X	X	X	--
FW-25C	SVOCs	VOCs	As (total and dissolved)[4,6]	Sentinel	n/a	QTR (4 events)[6] / SA (2 events) / then annual	X	X	X	--
FW-26B	SVOCs	VOCs	As (total and dissolved)[4,6]	Sentinel	n/a	QTR (4 events)[6] / SA (2 events) / then annual	X	X	X	--
FW-26C	SVOCs	VOCs	As (total and dissolved)[4,6]	Sentinel	n/a	QTR (4 events)[6] / SA (2 events) / then annual	X	X	X	--
FW-27B	SVOCs	VOCs	As (total and dissolved)	Transect area	all	QTR (4 events) / SA (2 events) / then annual	--**	X	X	X
FW-28B	SVOCs	VOCs	As (total and dissolved)	Boundary	all	QTR (4 events) / SA (2 events) / then annual	X (NO ARSENIC)	X	X	X
FW-29B	SVOCs	VOCs	As (total and dissolved)[4]	Sentinel	n/a	QTR (4 events) / SA (2 events) / then annual	--**	X	X	X
FW-29C	SVOCs	VOCs	As (total and dissolved)[4]	Sentinel	n/a	QTR (4 events) / SA (2 events) / then annual	--**	X	X	X
FW-30B	SVOCs	VOCs	As (total and dissolved)	Transect area	all	QTR (4 events) / SA (2 events) / then annual	--**	X	X	X

Notes:

(1) "QTR" indicates quarterly; "SA" indicates semiannual.

(2) "SVOCs" indicates semivolatile organic compounds. The specific list of SVOCs included in the program is provided in Table 5-6.

(3) "VOCs" indicates volatile organic compounds. The specific list of VOCs included in the program is provided in Table 5-6.

(4) FW-25B, FW-25C, FW-26B, FW-26C, FW-29B, and FW-29C will be sampled for arsenic quarterly until it is either confirmed by two successive sampling events that arsenic is not detected or it is confirmed by four successive sampling events that the arsenic concentration, where present, consistently does not exceed 10 µg/l MCL.

(5) Note that for FW-24C, arsenic analysis is required for Zone 1 on an annual basis only. Arsenic is not required for the other zones. Analysis for SVOCs and VOCs is required on a semiannual basis.

(6) As of the Second Quarter 2010, FW-25B, FW-25C, FW-26B, and FW-26C have met their quarterly sampling requirements will be sampled on a semiannual basis starting in the second semiannual period of 2010. Arsenic is no longer required in these wells.

* Quarterly frequency added to the May 2010 revisions to the CGMSAP at the time of sampling, these wells had an annual frequency.

** Monitoring well not installed at the time of sampling.

Table 4a
Summary of Groundwater Elevations
First Quarter 2010 Groundwater Monitoring Event
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Well Number	Gauging Date	Top of Casing Elevation (ft msl)	Depth To Water (ft)	Measured Total Depth (ft TOC)	Apparent LNAPL Thickness (ft)	Apparent DNAPL Thickness (ft)	Groundwater Elevation (ft msl)
ITW-12	2/1/10	177.49	6.89	19.83	NP	NP	170.60
ITW-22	2/1/10	180.54	10.25	16.55	NP	NP	170.29
M-09AR	2/1/10	173.80	9.92(1)	17.58	NP	NP	163.88
M-09BR	2/1/10	173.22	9.27(1)	28.22	NP	NP	163.95
M-16B	2/1/10	180.56	9.28	23.11	NP	NP	171.28
M-17	2/1/10	182.86	11.31	15.16	NP	NP	171.55
M-20B	2/1/10	183.67	10.21	25.29	NP	NP	173.46
M-23BR	2/1/10	185.10	10.58	25.77	NP	NP	174.52
M-25B	2/1/10	186.15	10.77	25.05	NP	NP	175.38
M-33B	2/1/10	176.39	9.74	27.07	NP	NP	166.65
HG-2D	2/1/10	188.88	53.83	112.76	NP	NP	135.05
HG-4D	2/1/10	180.91	43.04	107.75	NP	NP	137.87
HG-4S	2/1/10	180.41	11.47	52.40	NP	NP	168.94
HG-5D	2/1/10	187.73	55.93	112.71	NP	NP	131.80
HG-6D	2/1/10	185.02	41.42	107.64	NP	NP	143.60
HG-6S	2/1/10	184.86	13.66	52.65	NP	NP	171.20
HG-20D	2/1/10	174.33	37.82	83.96	NP	NP	136.51
HG-20S	2/1/10	174.37	6.95	39.56	NP	NP	167.42
HG-21D	2/1/10	167.90	36.55	94.68	NP	NP	131.35
HG-21S	2/1/10	167.72	9.71	40.92	NP	NP	158.01
HG-22D	2/1/10	186.15	43.85	82.36	NP	NP	142.30
HG-23D	2/1/10	186.70	52.15	89.25	NP	NP	134.55
HG-24S	2/1/10	184.28	14.45	71.55	NP	NP	169.83
HG-25D	2/1/10	181.30	51.44	85.71	NP	NP	129.86
HG-26D	2/1/10	182.92	40.11	93.80	NP	NP	142.81
HG-26S	2/1/10	183.21	12.42	44.12	NP	NP	170.79
HG-27D	2/1/10	162.42	32.25	96.22	NP	NP	130.17
HG-27S	2/1/10	162.48	8.16	59.66	NP	NP	154.32
HG-29D	2/1/10	179.17	41.15	96.38	NP	NP	138.02
HG-29S	2/1/10	179.17	15.67(2)	54.28	NP	NP	163.50
FW-4	2/1/10	173.91	129.90	159.70	NP	NP	44.01
FW-25B	2/1/10	152.59	108.82	230.00(3)	NP	NP	43.77
FW-25C	2/1/10	153.22	109.40	380.00(3)	NP	NP	43.82
FW-26B	2/1/10	154.85	111.21	230.00(3)	NP	NP	43.64
FW-26C	2/1/10	154.71	110.11	393.98(3)	NP	NP	44.60

Notes:

(1) Depth to water measurements at M-09AR and M-09BR inadvertantly reversed on field forms. Corrected depths based on historical data are shown above.

(2) Depth to water measurement at HG-29S is considered anomalous based on historical data.

(3) Installation total depth measurements used for FW-25B, FW-25C, FW-26B, and FW-26C.

ft msl - feet above mean sea level
ft toc - feet below top of casing
NP = no product measured or observed
LNAPL = Light Non-Aqueous Phase Liquid
DNAPL = Dense Non-Aqueous Phase Liquid

Table 4b
Summary of Groundwater Elevations
Second Quarter 2010 Groundwater Monitoring Event
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Well Number	Gauging Date	Top of Casing Elevation (ft msl)	Depth To Water (ft)	Measured Total Depth (ft TOC)	Apparent LNAPL Thickness (ft)	Apparent DNAPL Thickness (ft)	Groundwater Elevation (ft msl)
ITW-12	5/24/10	177.49	7.59	20.03	NP	NP	169.90
ITW-22	5/24/10	180.54	10.92	16.77	NP	NP	169.62
M-09AR	5/24/10	173.80	11.36	17.82	NP	NP	162.44
M-09BR	5/24/10	173.22	10.65	28.50	NP	NP	162.57
M-12	5/24/10	181.06	10.53	14.38	NP	NP	170.53
M-16A	5/24/10	180.96	10.18	15.43	NP	NP	170.78
M-16B	5/24/10	180.56	9.76	23.32	NP	NP	170.80
M-17	5/24/10	182.86	11.55	15.34	NP	NP	171.31
M-20B	5/24/10	183.67	10.73	25.51	NP	NP	172.94
M-23BR	5/24/10	185.10	11.17	25.99	NP	NP	173.93
M-25B	5/24/10	186.15	11.42	25.31	NP	NP	174.73
M-33B	5/24/10	176.39	10.69	27.30	NP	NP	165.70
HG-2D	5/24/10	188.88	53.10	113.00	NP	NP	135.78
HG-4D	5/24/10	180.91	42.27	107.98	NP	NP	138.64
HG-4S	5/24/10	180.41	11.72	52.60	NP	NP	168.69
HG-5D	5/24/10	187.73	55.18	112.82	NP	NP	132.55
HG-6D	5/24/10	185.02	40.59	107.90	NP	NP	144.43
HG-6S	5/24/10	184.86	13.65	52.86	NP	NP	171.21
HG-20D	5/24/10	174.33	37.14	84.25	NP	NP	137.19
HG-20S	5/24/10	174.37	7.55	39.83	NP	NP	166.82
HG-21D	5/24/10	167.90	35.88	94.96	NP	NP	132.02
HG-21S	5/24/10	167.72	9.68	41.18	NP	NP	158.04
HG-22D	5/24/10	186.15	43.15	82.68	NP	NP	143.00
HG-23D	5/24/10	186.70	51.50	89.58	NP	NP	135.20
HG-24S	5/24/10	184.28	13.72	71.67	NP	NP	170.56
HG-25D	5/24/10	181.30	50.84	86.04	NP	NP	130.46
HG-26D	5/24/10	182.92	39.42	94.11	NP	NP	143.50
HG-26S	5/24/10	183.21	12.30	44.35	NP	NP	170.91
HG-27D	5/24/10	162.42	31.91	96.39	NP	NP	130.51
HG-27S	5/24/10	162.48	9.05	59.95	NP	NP	153.43
HG-29D	5/24/10	179.17	40.54	96.28	NP	NP	138.63
HG-29S	5/24/10	179.17	12.11	54.10	NP	NP	167.06
FW-4	5/24/10	173.91	128.49	160.04	NP	NP	45.42
FW-25B	5/24/10	152.59	107.72	230.00[(1)]	NP	NP	44.87
FW-25C	5/24/10	153.22	108.24	380.00[(1)]	NP	NP	44.98
FW-26B	5/24/10	154.85	110.15	230.00[(1)]	NP	NP	44.70
FW-26C	5/24/10	154.71	110.06	393.98[(1)]	NP	NP	44.65
FW-29B	5/24/10	162.76	117.74	252.73	NP	NP	45.02
FW-29C	5/24/10	163.08	118.08	>300	NP	NP	45.00

Notes:

[(1)] Installation total depth measurements used for FW-25B, FW-25C, FW-26B, and FW-26C.
ft msl - feet above mean sea level
ft toc - feet below top of casing
NP = no product measured or observed
LNAPL = Light Non-Aqueous Phase Liquid
DNAPL = Dense Non-Aqueous Phase Liquid

Table 5
Summary of Analytical Data for Surficial Aquifer Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Analyte	Federal MCL [1] (ug/l)	Florida GCTL [2] (ug/l)	ITW-22 2/2/2010 SMP	M-09AR 2/2/2010 SMP	M-09BR 2/3/2010 SMP	M-12 5/26/2010 SMP	M-12 5/26/2010 DUP	M-16A 5/26/2010 SMP	M-16B 2/4/2010 SMP
Temperature (°C)	NA	NA	17.94	18.39	18.24	21.77	--	19.04	19.28
pH (S.U.)	NA	NA	6.36	5.72	4.76	5.69	--	6.33	4.51
Conductivity (mS/cm)	NA	NA	0.215	0.136	0.080	0.075	--	0.174	0.061
Oxidation Reduction Potential (mV)	NA	NA	-5.3	20.9	16.4	127.4	--	-87.1	71.8
Dissolved Oxygen (mg/l)	NA	NA	1.28	0.78	0.20	5.05	--	0.82	0.37
Turbidity (NTU)	NA	NA	1.44	7.58	1.01	6.39	--	9.59	5.08
METALS									
ARSENIC (dissolved)	10	10	--	7.8 J	4.7	0.5 U	0.5 U	3.5	9.6
ARSENIC (total)	10	10	--	7 J	5	0.5 U	0.5 U	3.5	11
CHROMIUM (dissolved)	100	100	--	--	--	2.6	3	--	--
CHROMIUM (total)	100	100	--	--	--	3.1	3.4	--	--
VOCs									
BENZENE	5	1	1 U	1 U	1	1 U	1 U	1 U	2
ETHYLBENZENE	700	30	1 U	1 U	2	1 U	1 U	1 U	4
TOLUENE	10000	40	1 U	1 U	1 U	1 U	1 U	1 U	4.4
XYLENE (total)	1000	20	3 U	3 U	1	3 U	3 U	3 U	14.7
SVOCs									
2,4-DIMETHYLPHENOL	-	140	5.5 U	5.5 U	5.7 U	7.1 J	5.5 UJ	5.6 UJ	66 U
2-METHYLNAPHTHALENE	-	28	5.5 U	5.5 U	5.7 U	5.9 U	5.5 U	5.6 U	540
2-METHYLPHENOL	-	35	5.5 UJ	5.5 UJ	5.7 UJ	5.9 UJ	5.5 UJ	5.6 UJ	6.6 UJ
3&4-METHYLPHENOL	-	3.5 [3]	5.5 U	5.5 U	5.7 U	5.9 UJ	5.5 UJ	5.6 UJ	6.6 U
ACENAPHTHENE	-	20	5.5 U	5.5 U	44	5.9 U	5.5 U	20	270
ACENAPHTHYLENE	-	210	5.5 U	5.5 U	5.7 U	5.9 U	5.5 U	5.6 U	13
ANTHRACENE	-	2100	5.5 U	5.5 U	5.7 U	5.9 U	5.5 U	5.6 U	6.6 U
CARBAZOLE	-	1.8	0.82 U	0.82 U	34	0.88 U	0.82 U	55	500
DIBENZOFURAN	-	28	5.5 U	5.5 U	28	5.9 U	5.5 U	18	130
FLUORANTHENE	-	280	5.5 U	5.5 U	5.7 U	5.9 U	5.5 U	5.6 U	6.6 U
FLUORENE	-	280	5.5 U	5.5 U	34	5.9 U	5.5 U	21	130
NAPHTHALENE	-	14	5.5 U	5.5 U	27	5.9 U	5.5 U	15 U	5000
PENTACHLOROPHENOL	1	1	--	--	--	0.79 U	0.74 U	0.75 U	5.7 J
PHENANTHRENE	-	210	5.5 U	5.5 U	5.7 U	5.9 U	5.5 U	21	64
PHENOL	-	10	5.5 UJ	5.5 UJ	5.7 UJ	5.9 UJ	5.5 UJ	5.6 UJ	6.6 UJ
PYRENE	-	210	5.5 U	5.5 U	5.7 U	5.9 U	5.5 U	5.6 U	6.6 U

Table 5
Summary of Analytical Data for Surficial Aquifer Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Analyte	Federal MCL [1] (ug/l)	Florida GCTL [2] (ug/l)	M-17 2/3/2010 SMP	M-17 5/25/2010 SMP	M-20B 2/3/2010 SMP	M-23BR 2/4/2010 SMP	M-25B 2/4/2010 SMP	M-25B 2/4/2010 DUP	M-33B 5/26/2010 SMP
Temperature (°C)	NA	NA	18.61	19.13	18.96	19.48	18.98	--	19.95
pH (S.U.)	NA	NA	4.93	5.67	3.63	4.54	6.19	--	5.18
Conductivity (mS/cm)	NA	NA	0.139	0.104	0.160	0.179	3.822	--	0.056
Oxidation Reduction Potential (mV)	NA	NA	-36.8	28.5	5.3	70.1	-3.9	--	-12.5
Dissolved Oxygen (mg/l)	NA	NA	0.17	0.92	0.49	0.27	0.10	--	0.86
Turbidity (NTU)	NA	NA	1.11	1.76	0.89	2.98	1.39	--	9.84
METALS									
ARSENIC (dissolved)	10	10	25	23	55	5710	4.8	5.5	--
ARSENIC (total)	10	10	24	22	54	5820	5.2	5.3	--
CHROMIUM (dissolved)	100	100	--	--	--	--	--	--	--
CHROMIUM (total)	100	100	--	--	--	--	--	--	--
VOCs									
BENZENE	5	1	1 U	1 U	1 U	1.3	120	120	4.2
ETHYLBENZENE	700	30	1 U	1 U	2.7	2.5	110	110	4.2
TOLUENE	10000	40	1 U	1 U	1.6	2.2	210	210	5.7
XYLENE (total)	1000	20	3 U	3 U	5.7	9.9	340	330	10.8
SVOCs									
2,4-DIMETHYLPHENOL	-	140	5.7 U	5.6 UJ	5.4 U	6.2	140	130	8
2-METHYLNAPHTHALENE	-	28	5.7 U	5.6 U	56	260	900	880	23
2-METHYLPHENOL	-	35	5.7 UJ	5.6 UJ	5.4 UJ	5.5 UJ	41 J	46 J	5.6 U
3&4-METHYLPHENOL	-	3.5[3]	5.7 U	5.6 UJ	5.4 U	5.5 U	64	65	5.6 U
ACENAPHTHENE	-	20	70 J	27	77	250	330	310	43
ACENAPHTHYLENE	-	210	5.7 U	5.6 U	5.4 U	5.5 U	6	5.5 U	5.6 U
ANTHRACENE	-	2100	8.1	5.6 U	5.4 U	16	6.9	6	5.6 U
CARBAZOLE	-	1.8	42	25	56	59	170	150	63
DIBENZOFURAN	-	28	59 J	31	68	130	130	130	45
FLUORANTHENE	-	280	6.1	5.6 U	5.4 U	5.7	5.9 U	5.5 U	5.6 U
FLUORENE	-	280	72 J	32	79	150	100	100	42
NAPHTHALENE	-	14	5.7 U	30	300	400	6000	8700	670
PENTACHLOROPHENOL	1	1	5.2 J	0.75 UJ	41	2700	6.7 J	23	--
PHENANTHRENE	-	210	40	20	37	130	80	71	5.6
PHENOL	-	10	5.7 UJ	5.6 UJ	5.4 UJ	5.5 UJ	20 J	21 J	5.6 UJ
PYRENE	-	210	5.7 U	5.6 U	5.4 U	5.5 U	5.9 U	5.5 U	5.6 U

Notes:

U - Indicates analyte was not detected above the method detection limit (MDL)

J - Indicates result is estimated

Concentration exceeds Florida GCTL

Concentration exceeds Federal MCL

[1] Federal Maximum Contaminant Levels (MCLs) represent the National Primary Drinking Water Standards.

[2] Florida Groundwater Cleanup Target Levels (GCTLs) are guidelines as set forth in 62-777 Florida Administrative Code (F.A.C.).

[3] 3-Methylphenol and 4-Methylphenol cannot be quantified separately using USEPA SW-846 Method 8270C.

Table 6a
Summary of Analytical Data for Upper Hawthorn Group Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Analyte	Federal MCL [1] (ug/l)	Florida GCTL [2] (ug/l)	Well ID Sample Date Sample Type	HG-20S 2/3/2010 SMP	HG-20S 5/25/2010 SMP	HG-20S 5/25/2010 DUP	HG-21S 2/3/2010 SMP	HG-21S 5/25/2010 SMP	HG-24S 2/2/2010 SMP	HG-24S 2/2/2010 DUP	HG-24S 5/25/2010 SMP
Temperature (°C)	NA	NA		18.49	20.12	--	16.42	20.21	18.88	--	18.32
pH (S.U.)	NA	NA		6.33	6.12	--	7.48	7.41	7.33	--	7.16
Conductivity (mS/cm)	NA	NA		0.364	0.311	--	0.257	0.264	0.216	--	0.209
ORP (mV)	NA	NA		-46.1	-25.6	--	-94.7	-128.2	-34.8	--	-83.6
Dissolved Oxygen (mg/l)	NA	NA		0.22	1.04	--	0.49	1.00	0.72	--	1.05
Turbidity (NTU)	NA	NA		1.27	1.64	--	1.42	1.25	2.59	--	1.61
VOCs											
BENZENE	5	1		2.7	2.8	2.8	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	700	30		4.9	4.6	4.6	1 U	1.2	1 U	1 U	1 U
TOLUENE	10000	40		1.7	1.6	1.6	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20		7.5 J	6.7	6.9	3 U	5.4	3 U	3 U	3 U
SVOCs											
2,4-DIMETHYLPHENOL	-	140		26	22 J	24 J	12	7.6 J	5.4 U	5.9 U	5.7 UJ
2-METHYLNAPHTHALENE	-	28		22	23	22	5.7 U	5.4 U	5.4 U	5.9 U	5.7 U
2-METHYLPHENOL	-	35		5.9 UJ	5.8 UJ	5.7 UJ	5.7 UJ	5.4 UJ	5.4 UJ	5.9 UJ	5.7 UJ
3&4-METHYLPHENOL	-	3.5[3]		5.9 U	5.8 UJ	5.7 UJ	5.7 U	5.4 UJ	5.4 U	5.9 U	5.7 UJ
ACENAPHTHENE	-	20		20	28	26	5.7 U	5.4 U	5.4 U	5.9 U	5.7 U
ACENAPHTHYLENE	-	210		5.9 U	5.8 U	5.7 U	5.7 U	5.4 U	5.4 U	5.9 U	5.7 U
CARBAZOLE	-	1.8		13	19	19	0.85 U	0.79 U	0.72 U	0.87 U	0.84 U
DIBENZOFURAN	-	28		11	17	16	5.7 U	5.4 U	5.4 U	5.9 U	5.7 U
FLUORANTHENE	-	280		5.9 U	5.8 U	5.7 U	5.7 U	5.4 U	5.4 U	5.9 U	5.7 U
FLUORENE	-	280		13	16	16	5.7 U	5.4 U	5.4 U	5.9 U	5.7 U
NAPHTHALENE	-	14		97	190	190	5.7 U	5.4 U	5.4 U	5.9 U	5.7 U
PENTACHLOROPHENOL	1	1		0.79 U	0.78 UJ	0.76 UJ	0.77 U	0.72 UJ	0.79 U	0.78 U	0.76 UJ
PHENANTHRENE	-	210		5.9 U	5.8 U	5.7 U	5.7 U	5.4 U	5.4 U	5.9 U	5.7 U
PHENOL	-	10		5.9 UJ	5.8 UJ	5.7 UJ	5.7 UJ	5.4 UJ	5.4 UJ	5.9 UJ	5.7 UJ
PYRENE	-	210		5.9 U	5.8 U	5.7 U	5.7 U	5.4 U	5.4 U	5.9 U	5.7 U

Table 6a
Summary of Analytical Data for Upper Hawthorn Group Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Analyte	Federal MCL [1] (ug/l)	Florida GCTL [2] (ug/l)	Well ID Sample Date Sample Type HG-26S 2/3/2010 SMP	HG-26S 5/26/2010 SMP	HG-27S 2/2/2010 SMP	HG-27S 5/25/2010 SMP	HG-29S 2/4/2010 SMP	HG-29S 2/4/2010 DUP	HG-29S 5/26/2010 SMP
Temperature (°C)	NA	NA	20.67	20.87	20.04	21.82	22.09	--	23.07
pH (S.U.)	NA	NA	5.89	6.31	9.00	8.23	5.25	--	5.28
Conductivity (mS/cm)	NA	NA	0.505	0.465	0.226	0.209	5.771	--	6.048
ORP (mV)	NA	NA	-71.6	-92	-98.7	-71.2	-83.2	--	-51.9
Dissolved Oxygen (mg/l)	NA	NA	0.31	1.16	1.44	1.35	0.10	--	5.28
Turbidity (NTU)	NA	NA	0.44	7.16	3.57	1.74	5.64	--	--
VOCs									
BENZENE	5	1	12	11	1 U	1 U	360	340	310
ETHYLBENZENE	700	30	25	22	1 U	1 U	78	70	100 U
TOLUENE	10000	40	7.3	6.3	1 U	1 U	1600	1400	1200
XYLENE (total)	1000	20	51 J	40.1	3 U	3 U	179 J	165 J	300 U
SVOCs									
2,4-DIMETHYLPHENOL	-	140	8.1	5.9 J	5.7 U	5.4 U	9900 J	7500 J	7300
2-METHYLNAPHTHALENE	-	28	230	190	5.7 U	5.4 UJ	61 U	59 U	530 U
2-METHYLPHENOL	-	35	6.5 U	5.5 UJ	5.7 UJ	5.4 UJ	13000 J	9800 J	9500 J
3&4-METHYLPHENOL	-	3.5[3]	6.5 U	5.5 UJ	5.7 U	5.4 U	24000 J	20000 J	35000 J
ACENAPHTHENE	-	20	140	180	5.7 U	5.4 U	61 U	59 U	530 U
ACENAPHTHYLENE	-	210	6.5 U	5.5 U	5.7 U	5.4 U	61 U	59 U	530 U
CARBAZOLE	-	1.8	100	87	0.85 U	0.8 U	9 U	8.8 U	78 U
DIBENZOFURAN	-	28	66	54	5.7 U	5.4 U	61 U	59 U	530 U
FLUORANTHENE	-	280	6.5 U	5.5 U	5.7 U	5.4 U	61 U	59 U	530 U
FLUORENE	-	280	74	59	5.7 U	5.4 U	61 U	59 U	530 U
NAPHTHALENE	-	14	1500	2300	5.7 U	5.4 U	61 U	59 U	530 U
PENTACHLOROPHENOL	1	1	1.4 J	0.73 U	0.77 U	0.73 UJ	8.1 UR	7.9 UR	70 U
PHENANTHRENE	-	210	6.5 U	5.5 U	5.7 U	5.4 U	61 U	59 U	530 U
PHENOL	-	10	6.5 UJ	5.5 UJ	5.7 UJ	5.4 UJ	21000 J	19000 J	31000 J
PYRENE	-	210	6.5 U	5.5 U	5.7 U	5.4 U	61 U	59 U	530 U

Notes:

U - Indicates analyte was not detected above the method detection limit (MDL)

J - Indicates result is estimated

B - Indicates field blank contamination

R - Unusable result; analyte may or may not be present in sample

Concentration exceeds Florida GCTL

Concentration exceeds Federal MCL

[1] Federal Maximum Contaminant Levels (MCLs) represent the National Primary Drinking Water Standards.

[2] Florida Groundwater Cleanup Target Levels (GCTLs) are guidelines set forth in 62-777 Florida Administrative Code (F.A.C.).

[3] 3-Methylphenol and 4-Methylphenol cannot be quantified separately using USEPA SW-846 Method 8270C.

Table 6b
Summary of Analytical Data for Lower Hawthorn Group Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Analyte	Federal MCL [1] (ug/l)	Florida GCTL [2] (ug/l)	Well ID Sample Date Sample Type	HG-20D 2/3/2010 SMP	HG-20D 5/25/2010 SMP	HG-21D 2/4/2010 SMP	HG-21D 5/26/2010 SMP	HG-22D 2/3/2010 SMP	HG-22D 5/25/2010 SMP
Temperature (°C)	NA	NA		20.70	23.47	20.82	25.58	18.66	23.82
pH (S.U.)	NA	NA		7.37	6.80	7.35	7.25	8.07	7.62
Conductivity (mS/cm)	NA	NA		0.35	0.326	0.312	0.345	0.235	0.292
ORP (mV)	NA	NA		-109.7	-73.1	-92.2	-112.8	-168.9	-72.6
Dissolved Oxygen (mg/l)	NA	NA		1.13	0.99	0.67	0.88	0.24	4.72
Turbidity (NTU)	NA	NA		0.40	0.36	2.40	11.00	2.22	9.90
VOCs									
BENZENE	5	1		1 U	1 U	48	49	1 U	1 U
ETHYLBENZENE	700	30		1 U	1 U	36	37	1 U	1 U
TOLUENE	10000	40		1 U	1 U	20	20	1 U	1 U
XYLENE (total)	1000	20		3 U	3 U	84 J	85	3 U	3 U
SVOCs									
2,4-DIMETHYLPHENOL	-	140		5.8	5.6 UJ	1000	2400	5.3 U	5.5 UJ
2-METHYLNAPHTHALENE	-	28		5.7 U	5.6 U	5.3 U	7	5.3 U	5.5 U
2-METHYLPHENOL	-	35		5.7 UJ	5.6 UJ	5.3 UJ	5.4 U	5.3 UJ	5.5 UJ
3&4-METHYLPHENOL	-	3.5[3]		5.7 U	5.6 UJ	130	5.4 U	5.3 U	5.5 UJ
ACENAPHTHENE	-	20		5.7 U	5.6 U	5.3 U	5.4 U	5.3 U	5.5 U
ACENAPHTHYLENE	-	210		5.7 U	5.6 U	5.3 U	5.4 U	5.3 U	5.5 U
CARBAZOLE	-	1.8		0.85 U	0.83 U	1.4 J	1.7 J	0.78 U	0.81 U
DIBENZOFURAN	-	28		5.7 U	5.6 U	5.3 U	5.4 U	5.3 U	5.5 U
FLUORANTHENE	-	280		5.7 U	5.6 U	5.3 U	5.4 U	5.3 U	5.5 U
FLUORENE	-	280		5.7 U	5.6 U	5.3 U	5.4 U	5.3 U	5.5 U
NAPHTHALENE	-	14		5.7 U	5.6 U	5.3 U	110	5.3 U	5.5 U
PENTACHLOROPHENOL	1	1		0.77 U	0.75 UJ	0.71 U	0.73 U	0.71 U	0.73 UJ
PHENANTHRENE	-	210		5.7 U	5.6 U	5.3 U	5.4 U	5.3 U	5.5 U
PHENOL	-	10		5.7 UJ	5.6 UJ	5.3 UJ	5.4 UJ	5.3 UJ	5.5 UJ
PYRENE	-	210		5.7 U	5.6 U	5.3 U	5.4 U	5.3 U	5.5 U

Table 6b
Summary of Analytical Data for Lower Hawthorn Group Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Analyte	Federal MCL [1] (ug/l)	Florida GCTL [2] (ug/l)	Well ID / Sample Date / Sample Type: HG-23D 2/3/2010 SMP	HG-23D 5/25/2010 SMP	HG-23D 5/25/2010 DUP	HG-25D 2/3/2010 SMP	HG-25D 5/25/2010 SMP
Temperature (°C)	NA	NA	20.95	24.16	--	23.09	23.19
pH (S.U.)	NA	NA	7.70	7.59	--	7.67	9.51
Conductivity (mS/cm)	NA	NA	0.267	0.276	--	0.259	0.271
ORP (mV)	NA	NA	-85.6	-95.3	--	-179.6	-78.1
Dissolved Oxygen (mg/l)	NA	NA	0.34	1.48	--	0.25	2.13
Turbidity (NTU)	NA	NA	2.01	1.00	--	2.98	5.50
VOCs							
BENZENE	5	1	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	700	30	1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	3 U	3 U	3 U	3 U	3 U
SVOCs							
2,4-DIMETHYLPHENOL	-	140	5.7 UJ	5.5 U	5.3 UJ	5.4 U	5.8 UJ
2-METHYLNAPHTHALENE	-	28	5.7 U	5.5 UJ	5.3 U	5.4 U	5.8 U
2-METHYLPHENOL	-	35	5.7 UJ	5.5 U	5.3 UJ	5.4 UJ	5.8 UJ
3&4-METHYLPHENOL	-	3.5[3]	5.7 UJ	5.5 UJ	5.3 UJ	5.4 U	5.8 UJ
ACENAPHTHENE	-	20	5.7 U	5.5 UJ	5.3 U	5.4 U	5.8 U
ACENAPHTHYLENE	-	210	5.7 U	5.5 U	5.3 U	5.4 U	5.8 U
CARBAZOLE	-	1.8	0.85 U	0.82 U	0.78 U	0.79 U	0.86 U
DIBENZOFURAN	-	28	5.7 U	5.5 U	5.3 U	5.4 U	5.8 U
FLUORANTHENE	-	280	5.7 U	5.5 U	5.3 U	5.4 U	5.8 U
FLUORENE	-	280	5.7 U	5.5 U	5.3 U	5.4 U	5.8 U
NAPHTHALENE	-	14	5.7 U	5.5 U	5.3 U	5.4 U	5.8 U
PENTACHLOROPHENOL	1	1	0.77 UJ	0.74 UJ	0.71 UJ	0.72 U	0.78 UJ
PHENANTHRENE	-	210	5.7 U	5.5 U	5.3 U	5.4 U	5.8 U
PHENOL	-	10	5.7 UJ	5.5 UJ	5.3 UJ	5.4 UJ	5.8 UJ
PYRENE	-	210	5.7 U	5.5 U	5.3 U	5.4 U	5.8 U

Table 6b
Summary of Analytical Data for Lower Hawthorn Group Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Analyte	Federal MCL [1] (ug/l)	Florida GCTL [2] (ug/l)	Well ID Sample Date Sample Type HG-26D 2/4/2010 SMP	HG-26D 5/25/2010 SMP	HG-27D 2/3/2010 SMP	HG-27D 5/25/2010 SMP	HG-29D 2/4/2010 SMP	HG-29D 5/26/2010 SMP
Temperature (°C)	NA	NA	20.29	23.9	18.91	24.54	20.61	24.82
pH (S.U.)	NA	NA	7.46	7.25	7.89	7.50	6.27	6.29
Conductivity (mS/cm)	NA	NA	0.254	0.252	0.247	0.246	3.054	2.248
ORP (mV)	NA	NA	-81.9	-105.1	-189.9	-148	-59.6	-83.5
Dissolved Oxygen (mg/l)	NA	NA	1.82	0.56	0.34	0.56	0.17	1.68
Turbidity (NTU)	NA	NA	1.20	1.79	5.56	0.45	2.21	9.66
VOCs								
BENZENE	5	1	2.9	4.7	1 U	1 U	110 J	130
ETHYLBENZENE	700	30	1 U	1.5	1 U	1 U	28	47
TOLUENE	10000	40	1 U	1.5	1 U	1 UJ	190	310
XYLENE (total)	1000	20	3 U	1.1	3 U	3 U	56 J	89
SVOCs								
2,4-DIMETHYLPHENOL	-	140	13	59 J	5.5 U	6.1 UJ	1700	2800
2-METHYLNAPHTHALENE	-	28	5.3 U	5.4 U	5.5 U	6.1 U	110 U	53 U
2-METHYLPHENOL	-	35	5.3 UJ	5.4 UJ	5.5 UJ	6.1 UJ	1700 J	2500 J
3&4-METHYLPHENOL	-	3.5[3]	5.3 U	5.4 UJ	5.5 U	6.1 UJ	8000	20000 J
ACENAPHTHENE	-	20	5.3 U	5.4 U	5.5 U	6.1 U	110 U	53 U
ACENAPHTHYLENE	-	210	5.3 U	5.4 U	5.5 U	6.1 U	110 U	53 U
CARBAZOLE	-	1.8	0.78 U	2.8 J	0.82 U	0.9 U	16 U	7.8 U
DIBENZOFURAN	-	28	5.3 U	5.4 U	5.5 U	6.1 U	110 U	53 U
FLUORANTHENE	-	280	5.3 U	5.4 U	5.5 U	6.1 U	110 U	53 U
FLUORENE	-	280	5.3 U	5.4 U	5.5 U	6.1 U	110 U	53 U
NAPHTHALENE	-	14	23	130	5.5 U	6.1 U	110 U	140
PENTACHLOROPHENOL	1	1	0.71 U	0.72 UJ	0.74 U	0.81 UJ	14 UJ	7.1 U
PHENANTHRENE	-	210	5.3 U	5.4 U	5.5 U	6.1 U	110 U	53 U
PHENOL	-	10	5.3 UJ	5.4 UJ	5.5 UJ	6.1 UJ	2100 J	2400 J
PYRENE	-	210	5.3 U	5.4 U	5.5 U	6.1 U	110 U	53 U

Notes:

U - Indicates analyte was not detected above the method detection limit (MDL)

J - Indicates result is estimated

B - Indicates field blank contamination

Concentration exceeds Florida GCTL

Concentration exceeds Federal MCL

[1] Federal Maximum Contaminant Levels (MCLs) represent the National Primary Drinking Water Standards.

[2] Florida Groundwater Cleanup Target Levels (GCTLs) are guidelines set forth in 62-777 Florida Administrative Code (F.A.C.).

[3] 3-Methylphenol and 4-Methylphenol cannot be quantified separately using USEPA SW-846 Method 8270C.

Table 7
Summary of Analytical Data for Floridan Aquifer Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Analyte	Federal MCL [1] (ug/l)	Florida GCTL [2] (ug/l)	Well ID Sample Date Sample Type FW-4 2/2/2010 SMP	FW-6 1/12/2010 SMP	FW-21B 1/12/2010 SMP	FW-21B 1/12/2010 DUP	FW-25B 2/2/2010 SMP	FW-25B 5/25/2010 SMP
Temperature (°C)	NA	NA	20.71	--	--	--	23.32	24.10
pH (S.U.)	NA	NA	7.55	--	--	--	7.81	7.27
Conductivity (mS/cm)	NA	NA	0.371	--	--	--	0.414	0.410
METALS								
ARSENIC (dissolved)	10	10	--	--	--	--	0.5 U	0.5 U
ARSENIC (total)	10	10	--	--	--	--	0.5 U	0.5 U
VOCs								
BENZENE	5	1	1 U	6.3	1.1	1	1 U	1 U
ETHYLBENZENE	700	30	1 U	2.5	1 U	1 U	1 U	1 U
TOLUENE	10000	40	1 U	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	3 U	13.2	3 U	3 U	3 U	3 U
SVOCs								
2,4-DIMETHYLPHENOL	-	140	5.1 U	6.6 U	5.2 U	5.2 U	5.7 U	5.4 U
2-METHYLNAPHTHALENE	-	28	5.1 U	88	10	12	5.7 U	5.4 U
2-METHYLPHENOL	-	35	5.1 UJ	6.6 U	5.2 U	5.2 U	5.7 UJ	5.4 U
3&4-METHYLPHENOL	-	3.5 [3]	0.78 U	1.1 U	0.80 U	0.80 U	0.88 U	0.82 U
ACENAPHTHENE	-	20	5.1 U	65	10	11	5.7 U	5.4 U
ACENAPHTHYLENE	-	210	5.1 U	6.6 U	5.2 U	5.2 U	5.7 U	5.4 U
ANTHRACENE	-	2100	5.1 U	6.6 U	5.2 U	5.2 U	5.7 U	5.4 U
CARBAZOLE	-	1.8	0.75 U	38	3.4 J	3.4 J	0.85 U	0.79 U
DIBENZOFURAN	-	28	5.1 U	37	5.2 U	5.6	5.7 U	5.4 U
FLUORANTHENE	-	280	5.1 U	7.4	5.2 U	5.2 U	5.7 U	5.4 U
FLUORENE	-	280	5.1 U	42	5.5	5.8	5.7 U	5.4 U
NAPHTHALENE	-	14	5.1 U	850	160	180	5.7 U	5.4 U
PHENANTHRENE	-	210	5.1 U	35	5.2 U	5.2 U	5.7 U	5.4 U
PHENOL	-	10	5.1 UJ	6.6 UJ	5.2 UJ	5.2 UJ	5.7 UJ	5.4 UJ
PYRENE	-	210	5.1 U	6.6 U	5.2 U	5.2 U	5.7 U	5.4 U

Table 7
Summary of Analytical Data for Floridan Aquifer Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Analyte	Federal MCL [1] (ug/l)	Florida GCTL [2] (ug/l)	Well ID Sample Date Sample Type FW-25C 2/2/2010 SMP	FW-25C 5/25/2010 SMP	FW-26B 2/3/2010 SMP	FW-26B 5/26/2010 SMP	FW-26B 5/26/2010 DUP
Temperature (°C)	NA	NA	22.60	24.60	22.53	23.30	--
pH (S.U.)	NA	NA	7.95	7.55	7.94	7.16	--
Conductivity (mS/cm)	NA	NA	0.367	0.359	0.425	0.417	--
METALS							
ARSENIC (dissolved)	10	10	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ARSENIC (total)	10	10	0.58 U	0.5 U	0.72 U	0.5 U	0.5 U
VOCs							
BENZENE	5	1	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	700	30	1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	3 U	3 U	3 U	3 U	3 U
SVOCs							
2,4-DIMETHYLPHENOL	-	140	5.3 U	6.4 U	5.5 U	5.2 UJ	5.2 U
2-METHYLNAPHTHALENE	-	28	5.3 U	6.4 U	5.5 U	5.2 U	5.2 U
2-METHYLPHENOL	-	35	5.3 UJ	6.4 U	5.5 UJ	5.2 UJ	5.2 U
3&4-METHYLPHENOL	-	3.5[3]	1.3 J	0.98 U	0.84 U	0.8 UJ	0.8 U
ACENAPHTHENE	-	20	5.3 U	6.4 U	5.5 U	5.2 U	5.2 U
ACENAPHTHYLENE	-	210	5.3 U	6.4 U	5.5 U	5.2 U	5.2 U
ANTHRACENE	-	2100	5.3 U	6.4 U	5.5 U	5.2 U	5.2 U
CARBAZOLE	-	1.8	0.78 U	0.94 U	0.81 U	0.77 U	0.77 U
DIBENZOFURAN	-	28	5.3 U	6.4 U	5.5 U	5.2 U	5.2 U
FLUORANTHENE	-	280	5.3 U	6.4 U	5.5 U	5.2 U	5.2 U
FLUORENE	-	280	5.3 U	6.4 U	5.5 U	5.2 U	5.2 U
NAPHTHALENE	-	14	5.3 U	6.4 U	5.5 U	5.2 U	5.2 U
PHENANTHRENE	-	210	5.3 U	6.4 U	5.5 U	5.2 U	5.2 U
PHENOL	-	10	5.3 UJ	6.4 UJ	5.5 UJ	5.2 UJ	5.2 UJ
PYRENE	-	210	5.3 U	6.4 U	5.5 U	5.2 U	5.2 U

Table 7
Summary of Analytical Data for Floridan Aquifer Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Analyte	Federal MCL [1] (ug/l)	Florida GCTL [2] (ug/l)	Well ID / Sample Date / Sample Type	FW-26C 2/3/2010 SMP	FW-26C 2/3/2010 DUP	FW-26C 5/25/2010 SMP	FW-29B 5/26/2010 SMP	FW-29C 5/26/2010 SMP
Temperature (°C)	NA	NA		22.73	--	24.10	24.2	25.8
pH (S.U.)	NA	NA		7.82	--	8.61	7.07	7.19
Conductivity (mS/cm)	NA	NA		0.420	--	0.423	0.365	0.417
METALS								
ARSENIC (dissolved)	10	10		0.5 U	0.5 U	0.5 U	16	4
ARSENIC (total)	10	10		0.5 U	0.73 U	0.5 U	15	3.5
VOCs								
BENZENE	5	1		1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	700	30		1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40		1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20		3 U	3 U	3 U	3 U	3 U
SVOCs								
2,4-DIMETHYLPHENOL	-	140		5.2 U	5.4 U	5.3 U	5.3 U	5.2 UJ
2-METHYLNAPHTHALENE	-	28		5.2 U	5.4 U	5.3 U	5.3 U	5.2 U
2-METHYLPHENOL	-	35		5.2 UJ	5.4 UJ	5.3 U	5.3 U	5.2 UJ
3&4-METHYLPHENOL	-	3.5[3]		0.8 U	0.82 U	0.82 U	0.82 U	0.79 UJ
ACENAPHTHENE	-	20		5.2 U	5.4 U	5.3 U	5.3 U	5.2 U
ACENAPHTHYLENE	-	210		5.2 U	5.4 U	5.3 U	5.3 U	5.2 U
ANTHRACENE	-	2100		5.2 U	5.4 U	5.3 U	5.3 U	5.2 U
CARBAZOLE	-	1.8		0.77 U	0.79 U	0.78 U	0.78 U	0.76 U
DIBENZOFURAN	-	28		5.2 U	5.4 U	5.3 U	5.3 U	5.2 U
FLUORANTHENE	-	280		5.2 U	5.4 U	5.3 U	5.3 U	5.2 U
FLUORENE	-	280		5.2 U	5.4 U	5.3 U	5.3 U	5.2 U
NAPHTHALENE	-	14		5.2 U	5.4 U	5.3 U	5.3 U	5.2 U
PHENANTHRENE	-	210		5.2 U	5.4 U	5.3 U	5.3 U	5.2 U
PHENOL	-	10		5.2 UJ	5.4 UJ	5.3 UJ	5.3 UJ	5.2 UJ
PYRENE	-	210		5.2 U	5.4 U	5.3 U	5.3 U	5.2 U

Notes:

U - Indicates analyte was not detected above the method detection limit (MDL)

J - Indicates result is estimated

Concentration exceeds Florida GCTL

Concentration exceeds Federal MCL

[1] Federal Maximum Contaminant Levels (MCLs) represent the National Primary Drinking Water Standards.

[2] Florida Groundwater Cleanup Target Level (GCTL) are guidelines set forth in 62-777 Florida Administrative Code (F.A.C.).

[3] 3-Methylphenol and 4-Methylphenol cannot be quantified separately using USEPA SW-846 Method 8270C.

Table 8a
Summary of Analytical Data for Westbay Upper Transmissive Zone Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)	WELL ID FW-12B							
			Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4
		Sample Date	1/12/2010	5/27/2010	1/12/2010	5/27/2010	1/12/2010	5/27/2010	1/12/2010	5/27/2010
METALS										
ARSENIC (dissolved)	10	10	--	--	--	--	--	--	--	--
ARSENIC (total)	10	10	--	--	--	--	--	--	--	--
VOCs										
BENZENE	5	1	2.9	3.1	1 U	1 U	5.6	5.2	3.5	3.3
ETHYLBENZENE	700	30	1.7	2	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40	4.4	4.9	1 U	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	3.3	1.5	3 U	3 U	7.5	6.7	6.1	5.6
SVOCs										
2,4-DIMETHYLPHENOL	-	140	29	25 J	6.5 U	5.8 UJ	6.4 U	5.3 UJ	5.4 U	5.2 UJ
2-METHYLNAPHTHALENE	-	28	6 U	5.7 U	6.5 U	5.8 U	58	75	18	25
2-METHYLPHENOL	-	35	28	25 J	7.5	5.8 UJ	6.4 U	5.3 UJ	5.4 U	5.2 UJ
3&4-METHYLPHENOL	-	3.5[3]	2.5 J	1.8 J	0.99 U	0.89 UJ	0.98 U	0.82 UJ	0.82 U	0.80 UJ
ACENAPHTHENE	-	20	6 U	5.7 U	6.5 U	5.8 U	54	63	32	39
ACENAPHTHYLENE	-	210	6 U	5.7 U	6.5 U	5.8 U	6.4 U	5.3 U	5.4 U	5.2 U
ANTHRACENE	-	2100	6 U	5.7 U	6.5 U	5.8 U	6.4 U	5.3 U	5.4 U	5.2 U
CARBAZOLE	-	1.8	0.89 U	0.85 U	0.95 U	0.86 U	9.9	16	15	15
DIBENZOFURAN	-	28	6 U	5.7 U	6.5 U	5.8 U	22	30	23	28
FLUORANTHENE	-	280	6 U	5.7 U	6.5 U	5.8 U	6.4 U	5.3 U	5.4 U	5.2 U
FLUORENE	-	280	6 U	5.7 U	6.5 U	5.8 U	30	37	23	28
NAPHTHALENE	-	14	76	86	6.5 U	5.8 U	750	870	360	520
PHENANTHRENE	-	210	6 U	5.7 U	6.5 U	5.8 U	23	26	5.4 U	5.2 U
PHENOL	-	10	6 UJ	5.7 UJ	6.5 UJ	5.8 UJ	6.4 UJ	5.3 UJ	5.4 UJ	5.2 UJ
PYRENE	-	210	6 U	5.7 U	6.5 U	5.8 U	6.4 U	5.3 U	5.4 U	5.2 U

Table 8a
Summary of Analytical Data for Westbay Upper Transmissive Zone Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)	WELL ID FW-16B		WELL ID FW-20B			
			Zone 1	Zone 1	Zone 1	Zone 1	Zone 2	Zone 2
		Sample Date	1/11/2010	5/26/2010	1/12/2010	5/27/2010	1/12/2010	5/27/2010
METALS								
ARSENIC (dissolved)	10	10	--	--	--	--	--	--
ARSENIC (total)	10	10	--	--	--	--	--	--
VOCs								
BENZENE	5	1	4.6	2.1	7.3	5.2	1 U	1.1
ETHYLBENZENE	700	30	2.2	1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40	4.4	1.8	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	4.4	3 U	4.9	2.4	3 U	3 U
SVOCs								
2,4-DIMETHYLPHENOL	-	140	120	86 J	5.2 U	5.5 UJ	6.4 U	5.3 UJ
2-METHYLNAPHTHALENE	-	28	5.9 U	6.5 U	53	110	6.4 U	10
2-METHYLPHENOL	-	35	8.8	6.5 UJ	5.2 U	5.5 UJ	6.4 U	5.3 UJ
3&4-METHYLPHENOL	-	3.5[3]	0.91 U	1 UJ	0.80 U	0.85 UJ	0.98 U	0.82 UJ
ACENAPHTHENE	-	20	5.9 U	6.5 U	47	63	33	39
ACENAPHTHYLENE	-	210	5.9 U	6.5 U	5.2 U	5.5 U	6.4 U	5.3 U
ANTHRACENE	-	2100	5.9 U	6.5 U	5.2 U	5.5 U	6.4 U	5.3 U
CARBAZOLE	-	1.8	0.88 U	0.97 U	6.2	14	0.94 U	0.78 U
DIBENZOFURAN	-	28	5.9 U	6.5 U	29	35	15	20
FLUORANTHENE	-	280	5.9 U	6.5 U	7.3	8.5	6.4 U	5.3 U
FLUORENE	-	280	5.9 U	6.5 U	33	42	21	26
NAPHTHALENE	-	14	30	31	690	1100	63	240
PHENANTHRENE	-	210	5.9 U	6.5 U	26	34	6.4 U	11
PHENOL	-	10	5.9 UJ	6.5 UJ	5.2 UJ	5.5 UJ	6.4 UJ	5.3 UJ
PYRENE	-	210	5.9 U	6.5 U	5.2 U	5.5 U	6.4 U	5.3 U

Table 8a
Summary of Analytical Data for Westbay Upper Transmissive Zone Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)	WELL ID FW-22B							
			Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4
		Sample Date	2/1/2010	6/23/2010	2/1/2010	6/23/2010	2/1/2010	6/23/2010	2/1/2010	6/23/2010
METALS										
ARSENIC (dissolved)	10	10	--	--	--	--	--	--	--	--
ARSENIC (total)	10	10	--	--	--	--	--	--	--	--
VOCs										
BENZENE	5	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	700	30	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
SVOCs										
2,4-DIMETHYLPHENOL	-	140	5.6 U	5.7 UJ	5.2 U	6.5 UJ	5.9 U	6.1 UJ	6.1 U	6.1 UJ
2-METHYLNAPHTHALENE	-	28	5.6 U	5.7 U	5.2 U	6.5 U	5.9 U	6.1 U	6.1 U	6.1 U
2-METHYLPHENOL	-	35	5.6 UJ	5.7 UJ	5.2 UJ	6.5 UJ	5.9 UJ	6.1 UJ	6.1 UJ	6.1 UJ
3&4-METHYLPHENOL	-	3.5[3]	0.86 U	0.87 UJ	0.8 U	0.99 UJ	0.9 U	0.93 UJ	0.94 U	0.93 UJ
ACENAPHTHENE	-	20	6.2	5.7 U	18	26	22	23	13	10
ACENAPHTHYLENE	-	210	5.6 U	5.7 U	5.2 U	6.5 U	5.9 U	6.1 U	6.1 U	6.1 U
ANTHRACENE	-	2100	5.6 U	5.7 U	5.2 U	6.5 U	5.9 U	6.1 U	6.1 U	6.1 U
CARBAZOLE	-	1.8	0.83 U	0.84 U	0.77 U	0.95 U	0.87 U	0.9 U	0.91 U	0.9 U
DIBENZOFURAN	-	28	5.6 U	5.7 U	5.2 U	6.5 U	5.9 U	6.1 U	6.1 U	6.1 U
FLUORANTHENE	-	280	5.6 U	5.7 U	5.2 U	6.5 U	5.9 U	6.1 U	6.1 U	6.1 U
FLUORENE	-	280	5.6 U	5.7 U	5.2 U	6.5 U	7.4	7.2	6.1 U	6.1 U
NAPHTHALENE	-	14	5.6 U	5.7 U	49	50	69	82	6.1 U	6.1 U
PHENANTHRENE	-	210	5.6 U	5.7 U	5.2 U	6.5 U	5.9 U	6.1 U	6.1 U	6.1 U
PHENOL	-	10	5.6 UJ	5.7 UJ	5.2 UJ	6.5 UJ	5.9 UJ	6.1 UJ	6.1 UJ	6.1 UJ
PYRENE	-	210	5.6 U	5.7 U	5.2 U	6.5 U	5.9 U	6.1 U	6.1 U	6.1 U

Table 8a
Summary of Analytical Data for Westbay Upper Transmissive Zone Wells
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Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)	WELL ID FW-23B				WELL ID FW-24B				
			Zone 1	Zone 2	Zone 3	Zone 4	Zone 1	Zone 2	Duplicate	Zone 3	Zone 4
		Sample Date	5/26/2010	5/26/2010	5/26/2010	5/26/2010	6/22/2010	6/22/2010	6/22/2010	6/22/2010	6/22/2010
METALS											
ARSENIC (dissolved)	10	10	--	--	--	--	165	45	37	2.1	0.96 U*
ARSENIC (total)	10	10	--	--	--	--	156	42	42	2	0.41 U*
VOCs											
BENZENE	5	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	700	30	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
SVOCs											
2,4-DIMETHYLPHENOL	-	140	5.7 UJ	5.5 UJ	7.3 UJ	5.3 UJ	5.9 UJ	5.7 UJ	5.3 UJ	5.7 UJ	6 UJ
2-METHYLNAPHTHALENE	-	28	5.7 U	5.5 U	7.3 U	5.3 U	5.9 U	5.7 U	5.3 U	5.7 U	6 U
2-METHYLPHENOL	-	35	5.7 UJ	5.5 UJ	7.3 UJ	5.3 UJ	5.9 UJ	5.7 UJ	5.3 UJ	5.7 UJ	6 UJ
3&4-METHYLPHENOL	-	3.5[3]	6.8 U	0.84 UJ	1.2 UJ	0.82 UJ	0.91 UJ	0.88 UJ	0.81 UJ	0.88 UJ	0.92 UJ
ACENAPHTHENE	-	20	5.7 U	5.5 U	7.3 U	5.3 U	5.9 U	5.7 U	5.3 U	5.7 U	6 U
ACENAPHTHYLENE	-	210	5.7 U	5.5 U	7.3 U	5.3 U	5.9 U	5.7 U	5.3 U	5.7 U	6 U
ANTHRACENE	-	2100	5.7 U	5.5 U	7.3 U	5.3 U	5.9 U	5.7 U	5.3 U	5.7 U	6 U
CARBAZOLE	-	1.8	0.85 U	0.81 U	1.1 U	0.78 U	0.88 U	0.85 U	0.78 U	0.85 U	0.89 U
DIBENZOFURAN	-	28	5.7 U	5.5 U	7.3 U	5.3 U	5.9 U	5.7 U	5.3 U	5.7 U	6 U
FLUORANTHENE	-	280	5.7 U	5.5 U	7.3 U	5.3 U	5.9 U	5.7 U	5.3 U	5.7 U	6 U
FLUORENE	-	280	5.7 U	5.5 U	7.3 U	5.3 U	5.9 U	5.7 U	5.3 U	5.7 U	6 U
NAPHTHALENE	-	14	5.7 U	5.5 U	7.3 U	5.3 U	5.9 U	5.7 U	5.3 U	5.7 U	6 U
PHENANTHRENE	-	210	5.7 U	5.5 U	7.3 U	5.3 U	5.9 U	5.7 U	5.3 U	5.7 U	6 U
PHENOL	-	10	5.7 UJ	5.5 UJ	7.3 UJ	5.3 UJ	5.9 UJ	5.7 UJ	5.3 UJ	5.7 UJ	6 UJ
PYRENE	-	210	5.7 U	5.5 U	7.3 U	5.3 U	5.9 U	5.7 U	5.3 U	5.7 U	6 U

Table 8a
Summary of Analytical Data for Westbay Upper Transmissive Zone Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)	WELL ID FW-27B						
			Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Duplicate	Zone 6
		Sample Date	6/23/2010	6/23/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010
METALS									
ARSENIC (dissolved)	10	10	0.56 U*	0.57 U*	0.69 U*	2.5 R	6.2	7.2	10
ARSENIC (total)	10	10	0.84 U*	0.53 U*	0.51 U*	1.1 R	6.9	6.6	9.5
VOCs									
BENZENE	5	1	2.1	4.1	5.7	3	4.2	5.2	3.8
ETHYLBENZENE	700	30	1 U	1 U	1 U	1 U	1 U	1.2	1 U
TOLUENE	10000	40	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	2.8	3.8	5.5	2.9	5.2	6.8	4.8
SVOCs									
2,4-DIMETHYLPHENOL	-	140	5.9 UJ	5.2 UJ	5.5 UJ	5.8 UJ	5.4 UJ	5.7 UJ	5.2 UJ
2-METHYLNAPHTHALENE	-	28	25	130	80	59	110	100	46
2-METHYLPHENOL	-	35	5.9 UJ	5.2 UJ	5.5 UJ	5.8 UJ	5.4 UJ	5.7 UJ	5.2 UJ
3&4-METHYLPHENOL	-	3.5[3]	0.9 UJ	0.8 UJ	0.84 UJ	0.89 UJ	0.82 UJ	0.87 UJ	0.8 UJ
ACENAPHTHENE	-	20	39	98	62	68	69	70	54
ACENAPHTHYLENE	-	210	5.9 U	5.2 U	5.5 U	5.8 U	5.4 U	5.7 U	5.2 U
ANTHRACENE	-	2100	5.9 U	6	5.5 U	5.8 U	5.4 U	5.7 U	5.2 U
CARBAZOLE	-	1.8	1.6 J	24	11	10	15	15	10
DIBENZOFURAN	-	28	19	60	38	36	34	35	35
FLUORANTHENE	-	280	5.9 U	7.1	5.5 U	5.8 U	5.4 U	5.7 U	5.2 U
FLUORENE	-	280	24	68	45	44	40	42	38
NAPHTHALENE	-	14	560	1700	1100	1100	1200	1400	850
PHENANTHRENE	-	210	14	48	36	28	24	25	20
PHENOL	-	10	5.9 UJ	5.2 UJ	5.5 UJ	5.8 UJ	5.4 UJ	5.7 UJ	5.2 UJ
PYRENE	-	210	5.9 U	5.2 U	5.5 U	5.8 U	5.4 U	5.7 U	5.2 U

Table 8a
Summary of Analytical Data for Westbay Upper Transmissive Zone Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)	WELL ID							
			FW-28B							
			Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4
		Sample Date	3/16/2010	6/22/2010	3/16/2010	6/22/2010	3/15/2010	6/22/2010	3/15/2010	6/22/2010
METALS										
ARSENIC (dissolved)	10	10	--	1.7 J	--	0.8 U*	--	1.7	--	1.4 J
ARSENIC (total)	10	10	--	1.3 J	--	0.85 U*	--	1.6	--	0.96 U*
VOCs										
BENZENE	5	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	700	30	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40	3	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
SVOCs										
2,4-DIMETHYLPHENOL	-	140	5.6 UJ	5.6 UJ	6.6 U	5.5 UJ	5.2 U	5.4 UJ	6.4 U	5.5 UJ
2-METHYLNAPHTHALENE	-	28	5.6 UJ	5.6 U	6.6 U	5.5 U	5.2 U	5.4 U	6.4 U	5.5 U
2-METHYLPHENOL	-	35	5.6 UJ	5.6 UJ	6.6 U	5.5 UJ	5.2 U	5.4 UJ	6.4 U	5.5 UJ
3&4-METHYLPHENOL	-	3.5[3]	0.86 UJ	0.86 UJ	1.1 U	0.85 UJ	0.8 U	0.82 UJ	0.98 U	0.85 UJ
ACENAPHTHENE	-	20	5.6 UJ	5.6 U	6.6 U	5.5 U	5.2 U	5.4 U	6.4 U	5.5 U
ACENAPHTHYLENE	-	210	5.6 UJ	5.6 U	6.6 U	5.5 U	5.2 U	5.4 U	6.4 U	5.5 U
ANTHRACENE	-	2100	5.6 UJ	5.6 U	6.6 UJ	5.5 U	5.2 UJ	5.4 U	6.4 UJ	5.5 U
CARBAZOLE	-	1.8	0.83 U	0.83 U	0.98 U	0.82 U	0.77 U	0.79 U	0.94 U	0.82 U
DIBENZOFURAN	-	28	5.6 UJ	5.6 U	6.6 U	5.5 U	5.2 U	5.4 U	6.4 U	5.5 U
FLUORANTHENE	-	280	5.6 U	5.6 U	6.6 U	5.5 U	5.2 U	5.4 U	6.4 U	5.5 U
FLUORENE	-	280	5.6 UJ	5.6 U	6.6 U	5.5 U	5.2 U	5.4 U	6.4 U	5.5 U
NAPHTHALENE	-	14	5.6 UJ	5.6 U	6.6 U	5.5 U	5.2 U	5.4 U	6.4 U	5.5 U
PHENANTHRENE	-	210	5.6 U	5.6 U	6.6 U	5.5 U	5.2 U	5.4 U	6.4 U	5.5 U
PHENOL	-	10	12 J	5.6 UJ	6.6 UJ	5.5 UJ	5.2 UJ	5.4 UJ	6.4 UJ	5.5 UJ
PYRENE	-	210	5.6 UJ	5.6 U	6.6 U	5.5 U	5.2 U	5.4 U	6.4 U	5.5 U

Table 8a
Summary of Analytical Data for Westbay Upper Transmissive Zone Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)	WELL ID FW-30B				
			Zone 1	Zone 2	Duplicate	Zone 3	Zone 4
		Sample Date	5/27/2010	5/27/2010	5/27/2010	5/27/2010	5/27/2010
METALS							
ARSENIC (dissolved)	10	10	--	--	--	--	--
ARSENIC (total)	10	10	--	--	--	--	--
VOCs							
BENZENE	5	1	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	700	30	1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	3 U	3 U	3 U	3 U	3 U
SVOCs							
2,4-DIMETHYLPHENOL	-	140	5.7 UJ	5.6 UJ	5.3 R	5.2 UJ	5.2 UJ
2-METHYLNAPHTHALENE	-	28	5.7 U	5.6 U	5.3 U	5.2 U	5.2 U
2-METHYLPHENOL	-	35	5.7 UJ	5.6 UJ	5.3 R	5.2 UJ	5.2 UJ
3&4-METHYLPHENOL	-	3.5[3]	0.87 UJ	0.86 UJ	0.81 R	0.80 UJ	0.80 UJ
ACENAPHTHENE	-	20	5.7 U	5.6 U	5.3 U	5.2 U	5.2 U
ACENAPHTHYLENE	-	210	5.7 U	5.6 U	5.3 U	5.2 U	5.2 U
ANTHRACENE	-	2100	5.7 U	5.6 U	5.3 U	5.2 U	5.2 U
CARBAZOLE	-	1.8	0.84 U	0.83 U	0.78 U	0.77 U	0.77 U
DIBENZOFURAN	-	28	5.7 U	5.6 U	5.3 U	5.2 U	5.2 U
FLUORANTHENE	-	280	5.7 U	5.6 U	5.3 U	5.2 U	5.2 U
FLUORENE	-	280	5.7 U	5.6 U	5.3 U	5.2 U	5.2 U
NAPHTHALENE	-	14	5.7 U	5.6 U	5.3 U	5.2 U	5.2 U
PHENANTHRENE	-	210	5.7 U	5.6 U	5.3 U	5.2 U	5.2 U
PHENOL	-	10	5.7 UJ	5.6 UJ	5.3 R	5.2 UJ	5.2 UJ
PYRENE	-	210	5.7 U	5.6 U	5.3 U	5.2 U	5.2 U

Notes:

B - Indicates analyte was detected in the field blank.

U - Indicates analyte was not detected above the method detection limit (MDL)

U* - Indicates nondetect result due to rinsate or laboratory blank

J - Indicates result is estimated

Concentration exceeds Florida GCTL

Concentration exceeds Federal MCL

[1] - Federal Maximum Contaminant Levels (MCLs) represent the National Primary Drinking Water Standards.

[2] - Florida Groundwater Cleanup Target Levels (GCTL) are guidelines set forthen in 62-777 Florida Administrative Code (F.A.C.).

[3] - 3-Methylphenol and 4-Methylphenol cannot be quantified separately using SW846.

Table 8b
Summary of Analytical Data for Westbay Lower Transmissive Zone Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Constituent	Federal MCL [1] (ug/L)	Florida GCTL[2] (ug/L)	WELL ID FW-4C			WELL ID FW-22C		
			Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3
		Sample Date	2/1/2010	2/1/2010	2/1/2010	2/2/2010	2/2/2010	2/2/2010
VOCs								
BENZENE	5	1	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	700	30	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40	1 U	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	3 U	3 U	3 U	3 U	3 U	3 U
SVOCs								
2,4-DIMETHYLPHENOL	-	140	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U
2-METHYLNAPHTHALENE	-	28	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U
2-METHYLPHENOL	-	35	6 UJ	5.1 UJ	5.4 UJ	5.4 UJ	5.3 UJ	5.4 UJ
3&4-METHYLPHENOL	-	3.5[3]	0.92 U	0.78 U	0.83 U	0.82 U	0.81 U	0.82 U
ACENAPHTHENE	-	20	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U
ACENAPHTHYLENE	-	210	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U
ANTHRACENE	-	2100	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U
CARBAZOLE	-	1.8	0.89 U	0.75 U	0.8 U	0.79 U	0.78 U	0.79 U
DIBENZOFURAN	-	28	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U
FLUORANTHENE	-	280	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U
FLUORENE	-	280	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U
NAPHTHALENE	-	14	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U
PHENANTHRENE	-	210	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U
PHENOL	-	10	6 UJ	5.1 UJ	5.4 UJ	5.4 UJ	5.3 UJ	5.4 UJ
PYRENE	-	210	6 U	5.1 U	5.4 U	5.4 U	5.3 U	5.4 U

Table 8b
Summary of Analytical Data for Westbay Lower Transmissive Zone Wells
2010 First Semiannual Comprehensive Groundwater Monitoring Report
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Constituent	Federal MCL [1] (ug/L)	Florida GCTL[2] (ug/L)	WELL ID FW-23C			WELL ID FW-24C				
			Zone 1	Zone 2	Zone 3	Zone 1	Duplicate	Zone 2	Zone 3	Zone 4
		Sample Date	3/3/2010	3/2/2010	3/2/2010	2/1/2010	2/1/2010	2/2/2010	2/2/2010	2/1/2010
VOCs										
BENZENE	5	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	700	30	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	10000	40	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENE (total)	1000	20	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
SVOCs										
2,4-DIMETHYLPHENOL	-	140	6.6 U	5.8 U	5.7 U	6 U	6.2 U	5.3 U	5.7 U	5.4 U
2-METHYLNAPHTHALENE	-	28	6.6 UJ	5.8 UJ	5.7 UJ	6 U	6.2 U	5.3 U	5.7 U	5.4 U
2-METHYLPHENOL	-	35	6.6 U	5.8 U	5.7 U	6 UJ	6.2 UJ	5.3 UJ	5.7 UJ	5.4 UJ
3&4-METHYLPHENOL	-	3.5[3]	1.1 U	0.89 U	0.88 U	0.92 U	0.96 U	0.81 U	0.88 U	0.82 U
ACENAPHTHENE	-	20	6.6 UJ	5.8 UJ	5.7 UJ	6 U	6.2 U	5.3 U	5.7 U	5.4 U
ACENAPHTHYLENE	-	210	6.6 U	5.8 U	5.7 U	6 U	6.2 U	5.3 U	5.7 U	5.4 U
ANTHRACENE	-	2100	6.6 UJ	5.8 UJ	5.7 UJ	6 U	6.2 U	5.3 U	5.7 U	5.4 U
CARBAZOLE	-	1.8	0.98 U	0.86 U	0.85 U	0.89 U	0.92 U	0.78 U	0.85 U	0.79 U
DIBENZOFURAN	-	28	6.6 UJ	5.8 UJ	5.7 UJ	6 U	6.2 U	5.3 U	5.7 U	5.4 U
FLUORANTHENE	-	280	6.6 UJ	5.8 UJ	5.7 UJ	6 U	6.2 U	5.3 U	5.7 U	5.4 U
FLUORENE	-	280	6.6 U	5.8 U	5.7 U	6 U	6.2 U	5.3 U	5.7 U	5.4 U
NAPHTHALENE	-	14	6.6 U	5.8 U	5.7 U	6 U	6.2 U	5.3 U	5.7 U	5.4 U
PHENANTHRENE	-	210	6.6 UJ	5.8 UJ	5.7 UJ	6 U	6.2 U	5.3 U	5.7 U	5.4 U
PHENOL	-	10	6.6 UJ	5.8 UJ	5.7 UJ	6 UJ	6.2 UJ	5.3 UJ	5.7 UJ	5.4 UJ
PYRENE	-	210	6.6 U	5.8 U	5.7 U	6 U	6.2 U	5.3 U	5.7 U	5.4 U

Notes:

B - Indicates analyte was detected in the field blank.

U - Indicates analyte was not detected above the method detection limit (MDL)

J - Indicates result is estimated

Concentration exceeds Florida GCTL

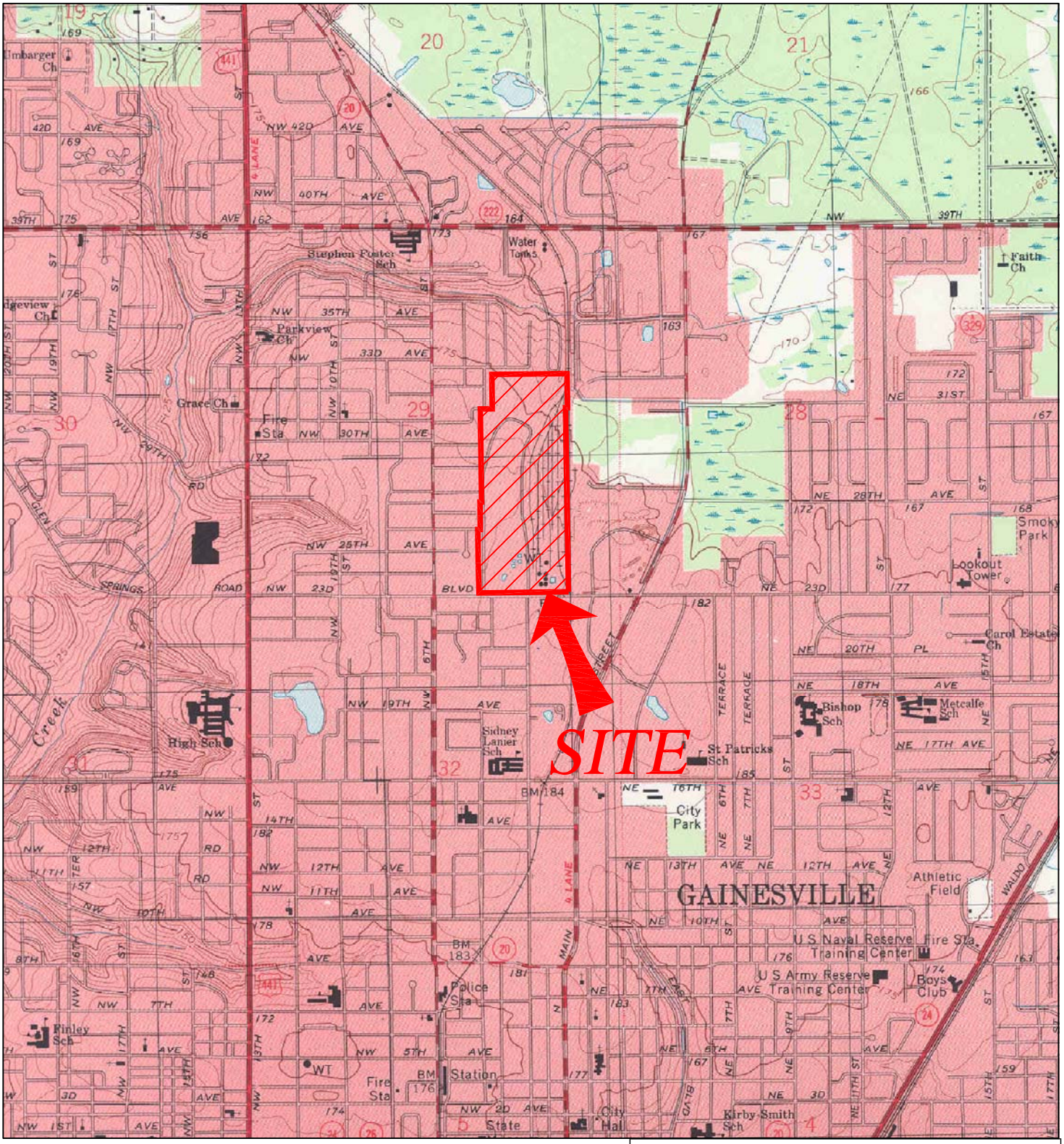
Concentration exceeds Federal MCL

[1] Federal Mazimum Contaminant Levels (MCLs) represent the National Primary Drinking Water Standards.

[2] Florida Groundwater Cleanup Target Levels (GCTLs) are guidelines set forth in 62-777 Florida Administrative Code (F.A.C.).

[3] 3-Methylphenol and 4-Methylphenol cannot be quantified separately using USEPA SW-846 Method 8270C.

FIGURES



N

FLORIDA

QUADRANGLE LOCATION

REFERENCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLES
GAINESVILLE EAST, FLORIDA – 1994

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	08/18/10
CHKD:	AMG	DATE:	08/18/10
APPD:	AMG	DATE:	08/18/10
SCALE:	1" = 1000'		
ISSUE DATE:			

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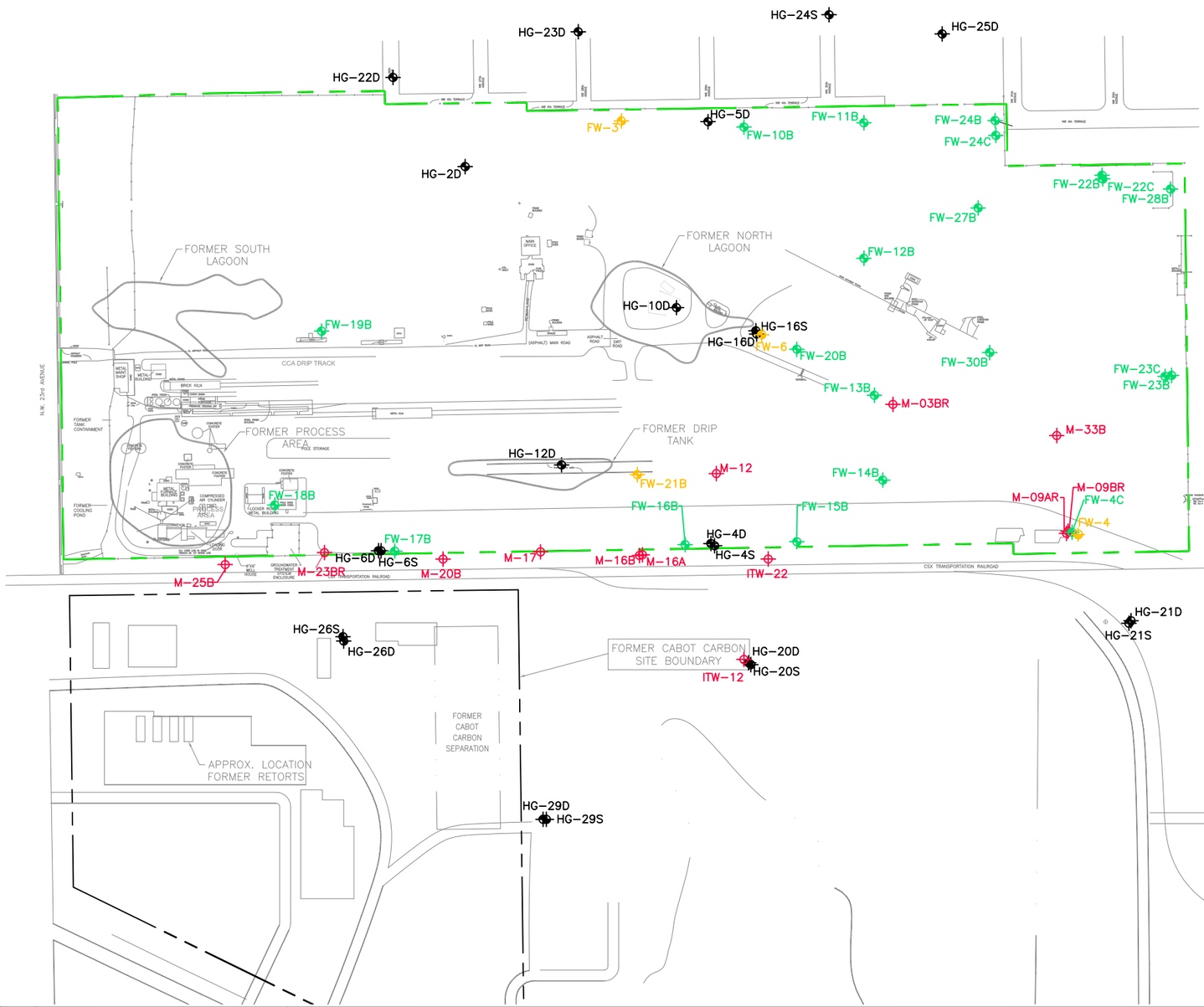
FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

SITE LOCATION MAP

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 1

FILE: Q:\PROJECTS\BEAZER PROJECTS\GAINESVILLE\CADD\1SA GW COMP REPORT 2010\FIGURE-1.DWG



LEGEND

- FW-21B — FLORIDAN STANDARD CONSTRUCTION MONITORING WELL
- FW-19B — FLORIDAN WESTBAY MONITORING WELL
- FW-25B — FLORIDAN SENTINEL MONITORING WELL
- HG-25D — HAWTHORN MONITORING WELL
- ITW-22 — SURFICIAL MONITORING WELL
- SUBJECT SITE PROPERTY LINE (APPROXIMATE)
- FORMER CABOT CARBON SITE BOUNDARY

0 350 700 FEET

REV #	DATE	DESCRIPTION	APPD
1			
2			
3			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: KC	DATE: 08/18/10	FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106
CHKD: RMB	DATE: 08/18/10	
APPD: AMG	DATE: 08/18/10	
SCALE: AS SHOWN		
ISSUE DATE:		

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

WELL LOCATION MAP

PROJECT NO: OM045010
DRAWING NUMBER
FIGURE 2

q:\projects\beazer projects\gainesville\cadd\1sa gw comp report 2010\figure-2.dwg Last Saved By: Kchintella 10/14/2010 8:10 AM Plotted By: Kendra L. Chintella 10/14/2010 8:10 AM Scale: 1:1

Explanation

- 167.59 / 167.58 — Surficial Aquifer well location and February 2010 potentiometric elevation (A-well in black, B-well in green)
- EW-1 — Extraction well
- −165− — Potentiometric surface contour, with posted contour elevation
- Former potential source areas
- Horizontal drain
- Drainage ditch

0 300 600

Scale in Feet

N

162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178

167.59 167.58 EW-5 161.12 161.51 161.39 163.30 166.65 164.53 167.83 166.89 165.34 167.59 167.22 165.43 EW-6 167.65 167.72 167.58 EW-3 167.59 167.69 EW-2 167.66 EW-1 168.28 168.72 EW-8 169.28 169.48 169.76 169.46 170.40 EW-9 169.44 169.83 EW-10 169.83 170.80 EW-11 170.45 170.50 170.77 172.40 170.92 EW-13 170.87 171.25 171.28 171.04 171.25 174.46 EW-14 171.10 171.55 174.14 173.28 173.38 173.36 EW-15 173.46 173.21 177.48 174.50 EW-16 174.48 176.41 176.43 177.01 176.95 175.30 EW-17 175.44 175.38 176.70 177.17 177.03 177.07 176.42 178.58 178.78 178.60 178.48 178.17 177.96 178.11 177.03

Koppers, Inc. Site

Former Lagoons

Cabot Carbon Site

NW 23rd Av

T:\Gainesville\MapInfo\WatLev\2010\WatLev_Surficial_Feb10.WOR

TITLE:	SURFICIAL AQUIFER POTENTIOMETRIC SURFACE CONTOURS FOR FEBRUARY 2010
LOCATION:	Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	DB
DRAFTED	LAD
FILE	WatLev Surf Feb10
DATE	10-1-10

FIGURE: 3a

N

LEGEND

HG–24S ⊕	UPPER HAWTHORN MONITORING WELL
169.83	GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION (FT–MSL)
168	GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION CONTOUR (FT–MSL) *(DASHED WHERE INFERRED)*
	SUBJECT SITE PROPERTY LINE (APPROXIMATE)
	FORMER CABOT CARBON SITE BOUNDARY

HG–24S 169.83

HG–6S 171.20

HG–4S 168.94

HG–26S 170.79

HG–20S 167.42

HG–21S 158.01

HG–27S 154.32

HG–29S 163.50

FORMER SOUTH LAGOON

FORMER NORTH LAGOON

FORMER PROCESS AREA

FORMER DRIP TRACK

FORMER CABOT CARBON SITE BOUNDARY

FORMER CABOT CARBON SEPARATION

APPROX. LOCATION FORMER RETORTS

N.W. 23rd AVENUE

CSX TRANSPORTATION RAILROAD

CCA DRIP TRACK

(ASPHALT) MAIN ROAD

0 300 600 FEET

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.
HG–29S NOT USED IN CONTOURING.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	09/10/10
CHKD:	RMW	DATE:	09/10/10
APPD:	AMG	DATE:	09/10/10
SCALE:	AS SHOWN		
ISSUE DATE:			

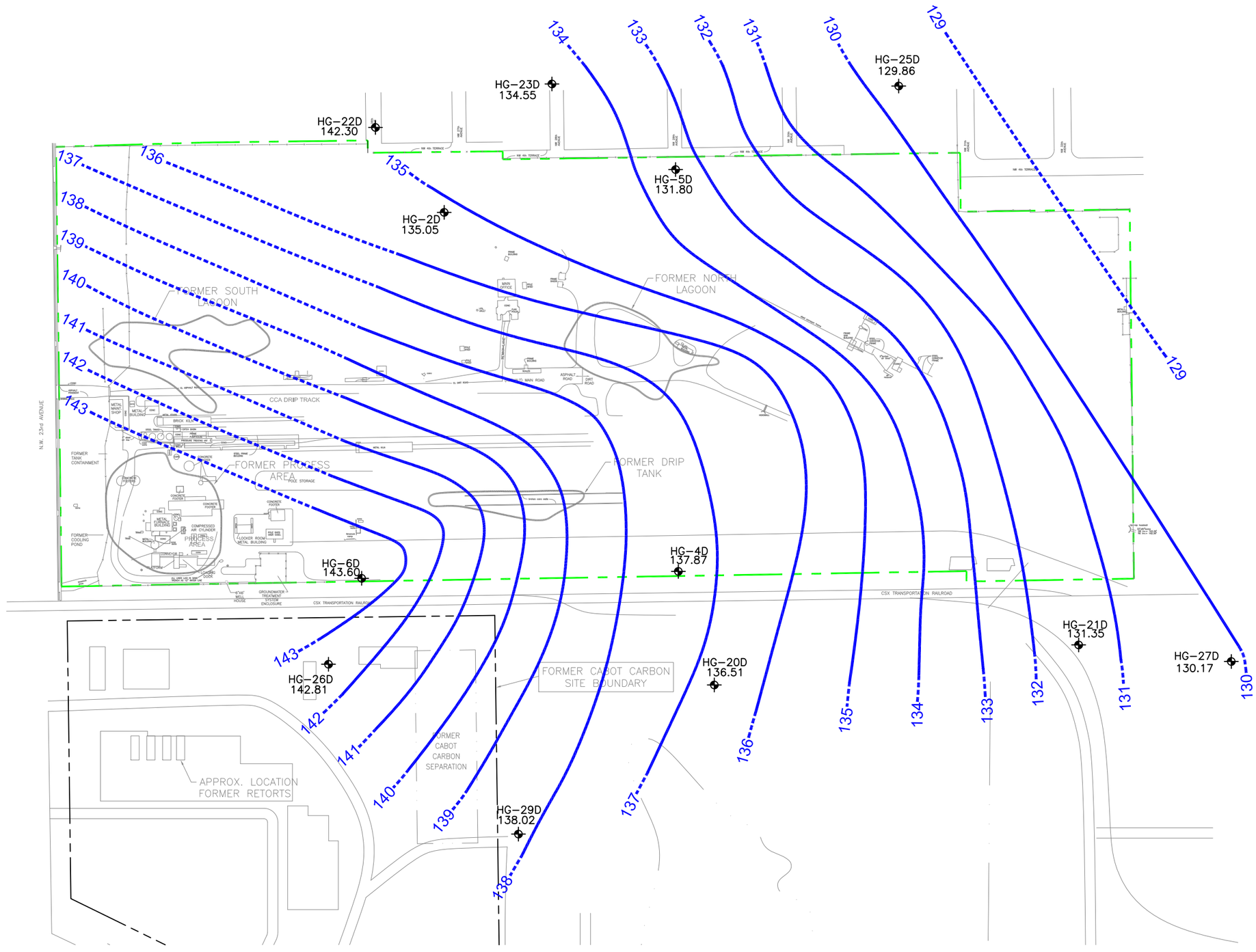
FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

UPPER HAWTHORN POTENTIOMETRIC SURFACE CONTOURS – FEBRUARY 2010

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 3b

q:\projects\beazer projects\gainesville\cadd\1sa gw comp report 2010\figure-3b.dwg Last Saved By: Kchintella 10/15/2010 8:26 AM Plotted By: Kendra L. Chintella 10/15/2010 8:26 AM Scale: 1:1



LEGEND

- HG-25D ⊕ — LOWER HAWTHORN MONITORING WELL
- 129.86 — GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION (FT-MSL)
- 135 — GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION CONTOUR (FT-MSL) *(DASHED WHERE INFERRED)*
- SUBJECT SITE PROPERTY LINE (APPROXIMATE)
- FORMER CABOT CARBON SITE BOUNDARY

0 300 600 FEET

REV #	DATE	DESCRIPTION	APPD
1			
2			
3			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.
HG-22D AND HG-5D NOT USED IN CONTOURING.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

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CHKD:	RMW	DATE:	09/10/10
APPD:	AMG	DATE:	09/10/10
SCALE:	AS SHOWN		
ISSUE DATE:			

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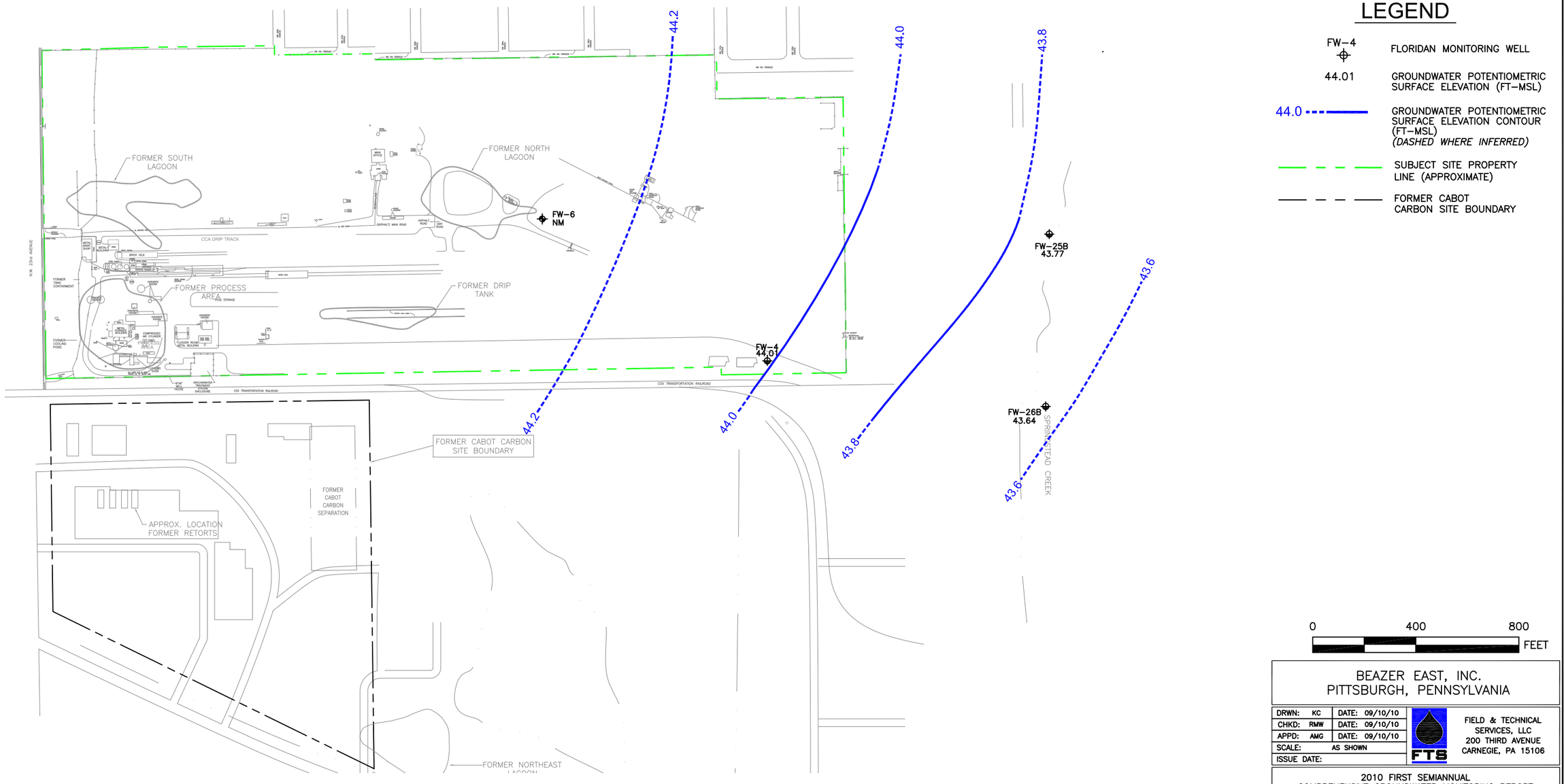
FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

LOWER HAWTHORN POTENTIOMETRIC MONITORING WELLS
SURFACE CONTOURS – FEBRUARY 2010

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 3c

q:\projects\beazer projects\gainesville\cadd\1sa gw comp report 2010\figure-3c.dwg Last Saved By: Kchintella 10/15/2010 9:49 AM Plotted By: Kendra L. Chintella 10/15/2010 9:49 AM Scale: 1:1



REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	09/10/10
CHKD:	RMW	DATE:	09/10/10
APPD:	AMG	DATE:	09/10/10
SCALE:	AS SHOWN		
ISSUE DATE:			

FTS
FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

FLORIDAN AQUIFER
POTENTIOMETRIC SURFACE CONTOURS
FEBRUARY 2010

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 3d

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Explanation

M-9AR 162.44 — Surficial Aquifer well location and May 2010 potentiometric elevation (A-well in black, B-well in green)

EW-1 — Extraction well

−165− — Potentiometric surface contour, with posted contour elevation

Former potential source areas

Horizontal drain

Drainage ditch

0 300 600

Scale in Feet

N

162 163 164 165 166 167 168 169 170 171 172 173 174 175 176

EW-1 EW-2 EW-3 EW-5 EW-6 EW-8 EW-9 EW-10 EW-11 EW-13 EW-14 EW-15 EW-16 EW-17

M-9BR 162.57

M-9AR 162.44

M-33B 165.70

ITW-22 169.49

ITW-12 170.20

M-12 170.53

M-16B 170.80

M-16A 170.78

M-17 171.31

M-20B 172.94

M-23BR 173.93

M-25B 174.73

Koppers, Inc. Site

Former Lagoons

Cabot Carbon Site

NW.23rd.Av

T:\Gainesville\MapInfo\WatLev\2010WatLev_Surficial_May10.WOR

TITLE: SURFICIAL AQUIFER POTENTIOMETRIC SURFACE CONTOURS FOR MAY 2010

LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	DB
DRAFTED	LAD
FILE	WatLev Surf May10
DATE	10-1-10

FIGURE: 4a

N

HG–24S
170.56

HG–6S
171.21

HG–4S
168.69

HG–26S
170.91

HG–20S
166.82

HG–29S
167.06

HG–21S
158.04

HG–27S
153.43

FORMER SOUTH LAGOON

FORMER NORTH LAGOON

FORMER PROCESS AREA

FORMER DRIP TANK

FORMER CABOT CARBON SITE BOUNDARY

FORMER CABOT CARBON SEPARATION

APPROX. LOCATION FORMER RETORTS

CCA DRIP TRACK

(ASPHALT) MAIN ROAD

CSX TRANSPORTATION RAILROAD

N.W. 23rd AVENUE

LEGEND

HG–24S ⊕	UPPER HAWTHORN MONITORING WELL
170.56	GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION (FT–MSL)
168	GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION CONTOUR (FT–MSL) *(DASHED WHERE INFERRED)*
	SUBJECT SITE PROPERTY LINE (APPROXIMATE)
	FORMER CABOT CARBON SITE BOUNDARY

0 300 600 FEET

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: KC	DATE: 09/10/10	FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106
CHKD: RMW	DATE: 09/10/10	
APPD: AMG	DATE: 09/10/10	
SCALE: AS SHOWN		
ISSUE DATE:		

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

UPPER HAWTHORN POTENTIOMETRIC SURFACE CONTOURS – MAY 2010

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 4b

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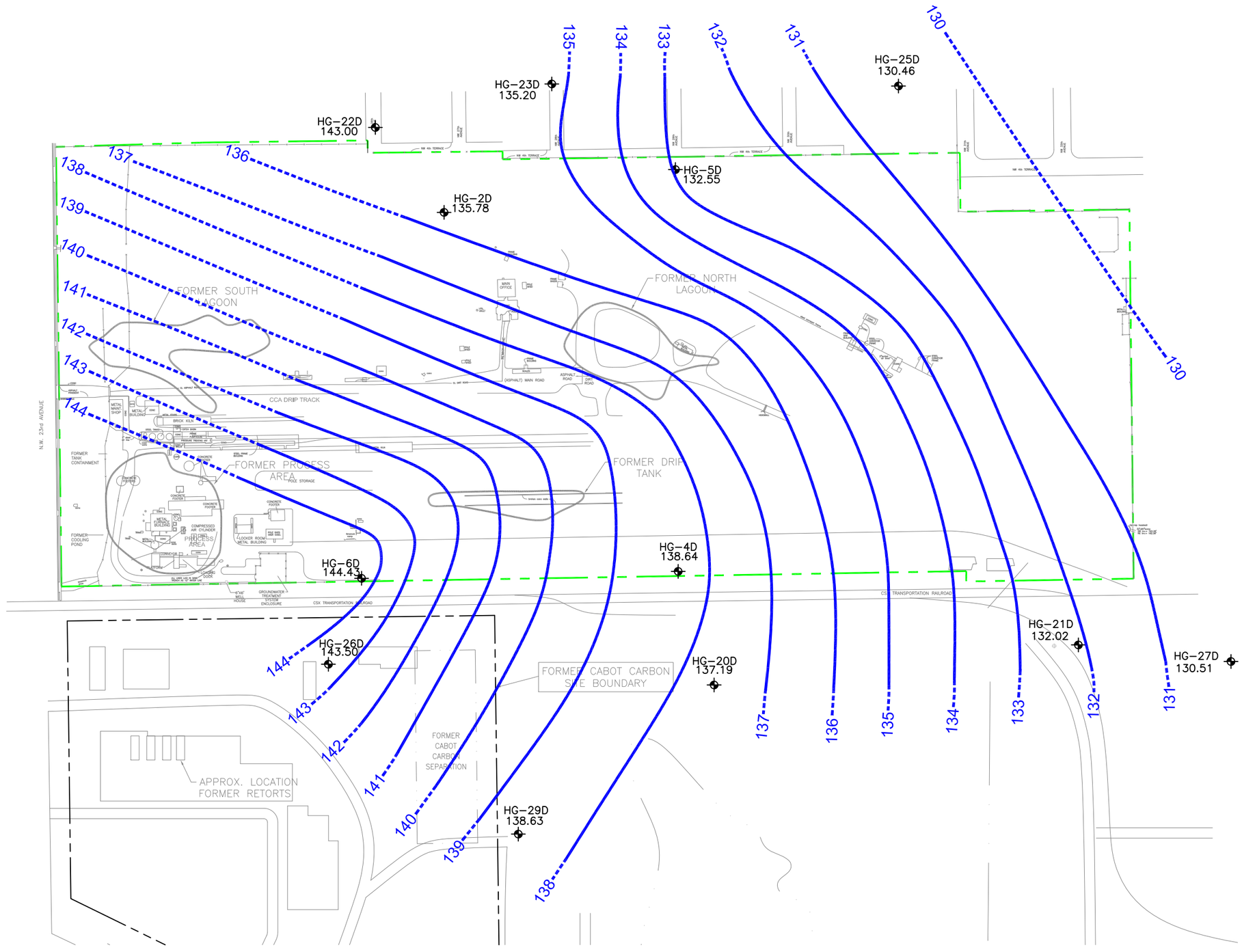

LEGEND

HG–25D ⊕	LOWER HAWTHORN MONITORING WELL
130.46	GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION (FT–MSL)
135	GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION CONTOUR (FT–MSL) *(DASHED WHERE INFERRED)*
	SUBJECT SITE PROPERTY LINE (APPROXIMATE)
	FORMER CABOT CARBON SITE BOUNDARY

0 300 600 FEET

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.
HG–22D NOT USED IN CONTOURING.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

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APPD:	AMG	DATE:	09/10/10
SCALE:	AS SHOWN		
ISSUE DATE:			

FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
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2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

LOWER HAWTHORN POTENTIOMETRIC MONITORING WELLS
SURFACE CONTOURS – MAY 2010

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 4c

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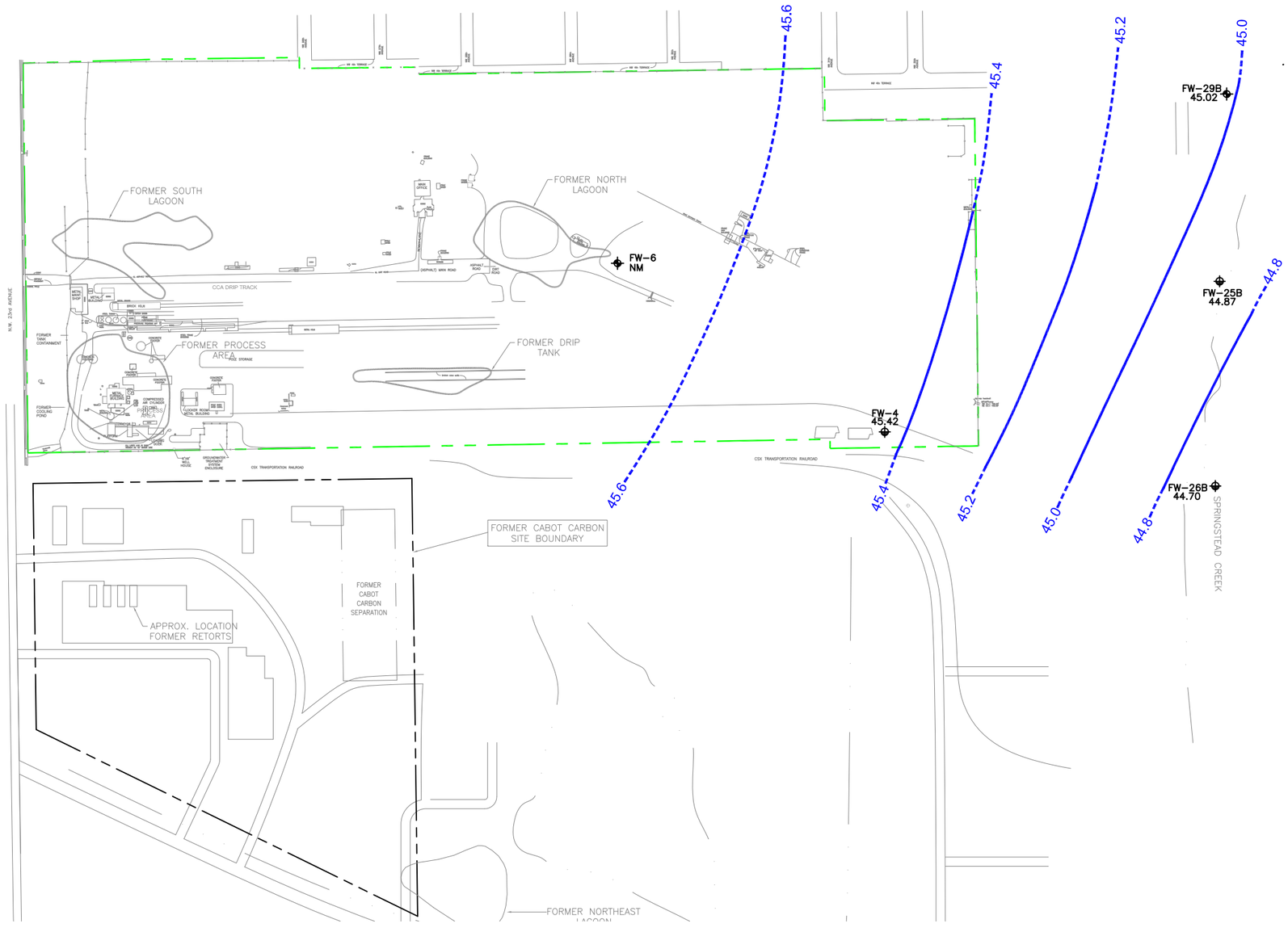

LEGEND

- FW–4 — FLORIDAN MONITORING WELL
- 45.42 — GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION (FT–MSL)
- 45.0 — GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION CONTOUR (FT–MSL) *(DASHED WHERE INFERRED)*
- SUBJECT SITE PROPERTY LINE (APPROXIMATE)
- FORMER CABOT CARBON SITE BOUNDARY

0 400 800 FEET

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	09/10/10
CHKD:	RMW	DATE:	09/10/10
APPD:	AMG	DATE:	09/10/10
SCALE:	AS SHOWN		
ISSUE DATE:			

FTS
FIELD & TECHNICAL SERVICES, LLC
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2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

FLORIDAN AQUIFER
POTENTIOMETRIC SURFACE CONTOURS
MAY 2010

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 4d

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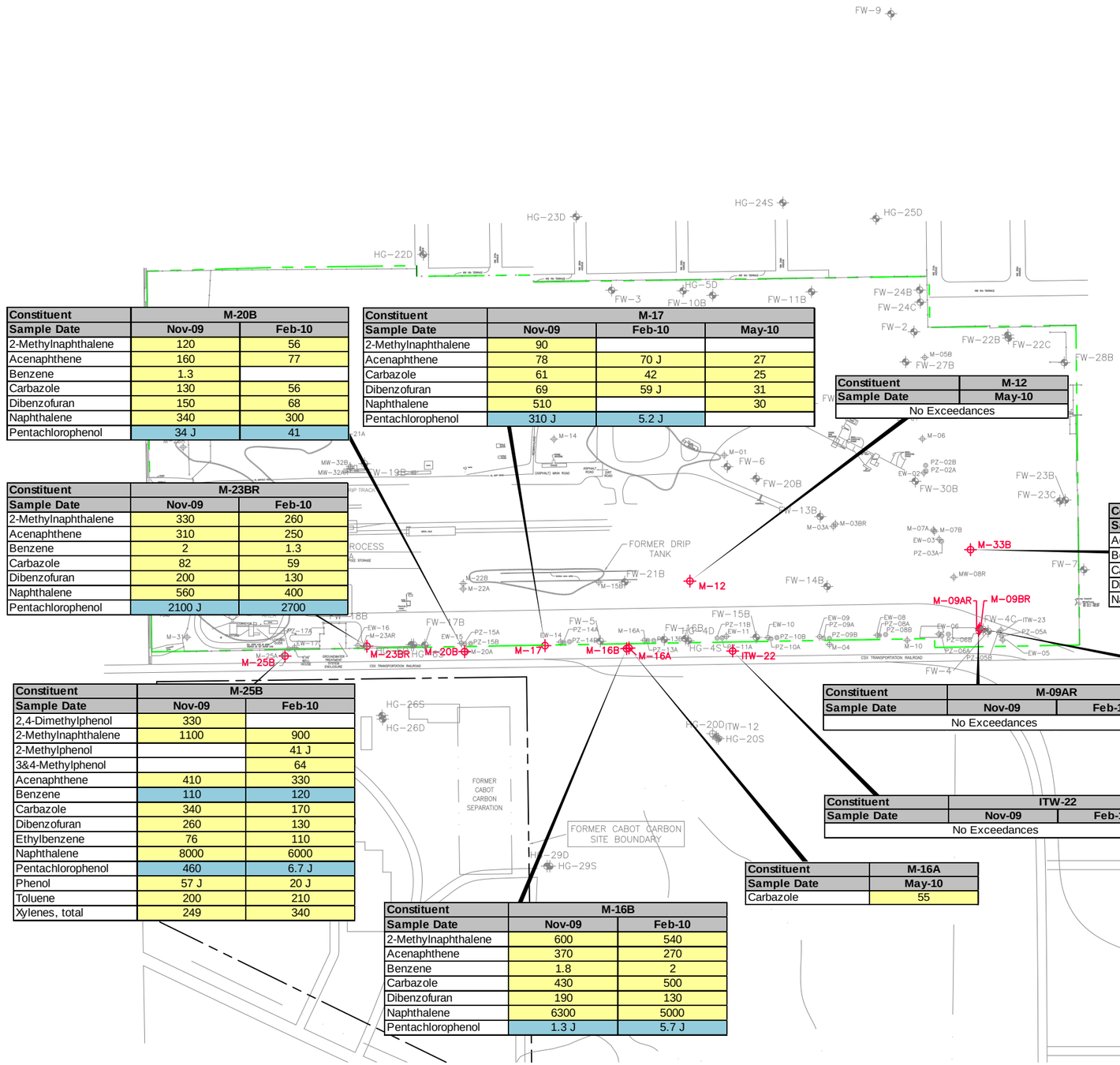

Constituent	M-20B	
Sample Date	Nov-09	Feb-10
2-Methylnaphthalene	120	56
Acenaphthene	160	77
Benzene	1.3	
Carbazole	130	56
Dibenzofuran	150	68
Naphthalene	340	300
Pentachlorophenol	34 J	41

Constituent	M-17		
Sample Date	Nov-09	Feb-10	May-10
2-Methylnaphthalene	90		
Acenaphthene	78	70 J	27
Carbazole	61	42	25
Dibenzofuran	69	59 J	31
Naphthalene	510		30
Pentachlorophenol	310 J	5.2 J	

Constituent	M-12
Sample Date	May-10
No Exceedances	

Constituent	M-23BR	
Sample Date	Nov-09	Feb-10
2-Methylnaphthalene	330	260
Acenaphthene	310	250
Benzene	2	1.3
Carbazole	82	59
Dibenzofuran	200	130
Naphthalene	560	400
Pentachlorophenol	2100 J	2700

Constituent	M-33B	
Sample Date	Nov-09	May-10
Acenaphthene	37	43
Benzene	4.6	4.2
Carbazole	59	63
Dibenzofuran	45	45
Naphthalene	460	670

Constituent	M-09BR	
Sample Date	Nov-09	Feb-10
Acenaphthene	47 J	44
Benzene	1.8	
Carbazole	45 J	34
Dibenzofuran	32 J	
Naphthalene	44 J	27

Constituent	M-09AR	
Sample Date	Nov-09	Feb-10
No Exceedances		

Constituent	ITW-22	
Sample Date	Nov-09	Feb-10
No Exceedances		

Constituent	M-25B	
Sample Date	Nov-09	Feb-10
2,4-Dimethylphenol	330	
2-Methylnaphthalene	1100	900
2-Methylphenol		41 J
3&4-Methylphenol		64
Acenaphthene	410	330
Benzene	110	120
Carbazole	340	170
Dibenzofuran	260	130
Ethylbenzene	76	110
Naphthalene	8000	6000
Pentachlorophenol	460	6.7 J
Phenol	57 J	20 J
Toluene	200	210
Xylenes, total	249	340

Constituent	M-16A
Sample Date	May-10
Carbazole	55

Constituent	M-16B	
Sample Date	Nov-09	Feb-10
2-Methylnaphthalene	600	540
Acenaphthene	370	270
Benzene	1.8	2
Carbazole	430	500
Dibenzofuran	190	130
Naphthalene	6300	5000
Pentachlorophenol	1.3 J	5.7 J

N

LEGEND

M-33B — SURFICIAL MONITORING WELL

SUBJECT SITE PROPERTY LINE (APPROXIMATE)

FORMER CABOT CARBON SITE BOUNDARY

STANDARDS

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)
Organic Chemicals		
2,4-Dimethylphenol	-	140
2-Methylnaphthalene	-	28
2-Methylphenol	-	35
3&4-Methylphenol	-	3.5[3]
Acenaphthene	-	20
Acenaphthylene	-	210
Anthracene	-	2100
Benzene	5	1
Carbazole	-	1.8
Dibenzofuran	-	28
Ethylbenzene	700	30
Fluoranthene	-	280
Fluorene	-	280
Naphthalene	-	14
Pentachlorophenol	1	1
Phenanthrene	-	210
Phenol	-	10
Pyrene	-	210
Toluene	10000	40
Xylene (total)	1000	20

0 400 800 FEET

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)
(3) 3-METHYLPHENOL AND 4-METHYLPHENOL CANNOT BE QUANTIFIED SEPERATELY USING USEPA SW-846 METHOD 8270C.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	08/17/10
CHKD:	KC	DATE:	08/17/10
APPD:	AMG	DATE:	08/17/10
SCALE:	AS SHOWN		
ISSUE DATE:			

FTS
FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

SURFICIAL AQUIFER MONITORING WELLS
ORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 5

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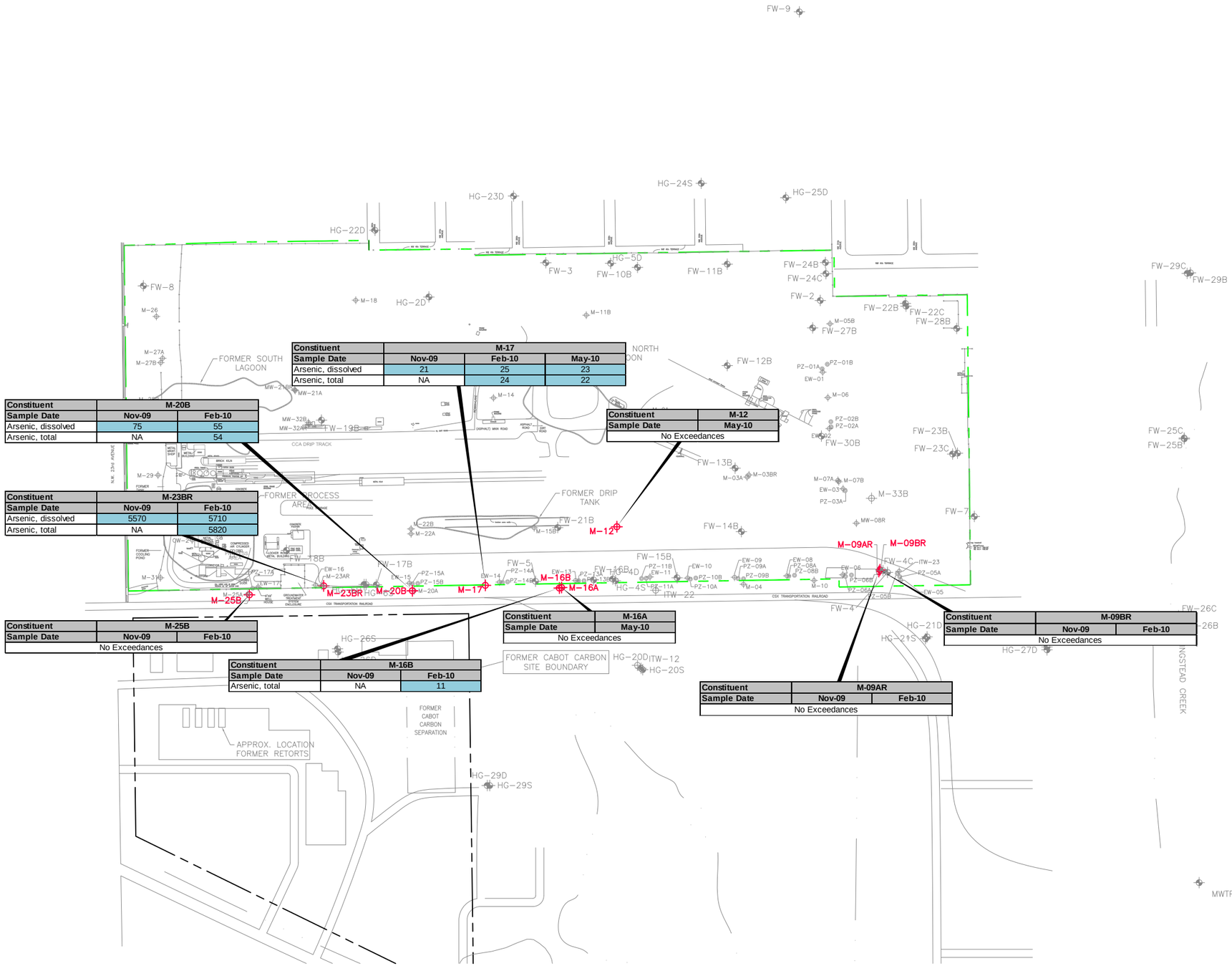

Constituent	M-20B	
Sample Date	Nov-09	Feb-10
Arsenic, dissolved	75	55
Arsenic, total	NA	54

Constituent	M-23BR	
Sample Date	Nov-09	Feb-10
Arsenic, dissolved	5570	5710
Arsenic, total	NA	5820

Constituent	M-25B	
Sample Date	Nov-09	Feb-10
No Exceedances		

Constituent	M-17		
Sample Date	Nov-09	Feb-10	May-10
Arsenic, dissolved	21	25	23
Arsenic, total	NA	24	22

Constituent	M-16B	
Sample Date	Nov-09	Feb-10
Arsenic, total	NA	11

Constituent	M-12
Sample Date	May-10
No Exceedances	

Constituent	M-16A
Sample Date	May-10
No Exceedances	

Constituent	M-09AR	
Sample Date	Nov-09	Feb-10
No Exceedances		

Constituent	M-09BR	
Sample Date	Nov-09	Feb-10
No Exceedances		

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)

N

LEGEND

M-17 — SURFICIAL MONITORING WELL

SUBJECT SITE PROPERTY LINE (APPROXIMATE)

FORMER CABOT CARBON SITE BOUNDARY

NA — ANALYTE NOT ANALYZED

STANDARDS

Constituent	Federal MCL(1) (ug/L)	Florida GCTL(2) (ug/L)
Metals		
Arsenic, dissolved	10	10
Arsenic, total	10	10

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	08/18/10
CHKD:	KC	DATE:	08/18/10
APPD:	AMG	DATE:	08/18/10
SCALE:	AS SHOWN		
ISSUE DATE:			

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FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

SURFICIAL AQUIFER MONITORING WELLS
INORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: OM045010
DRAWING NUMBER
FIGURE 6

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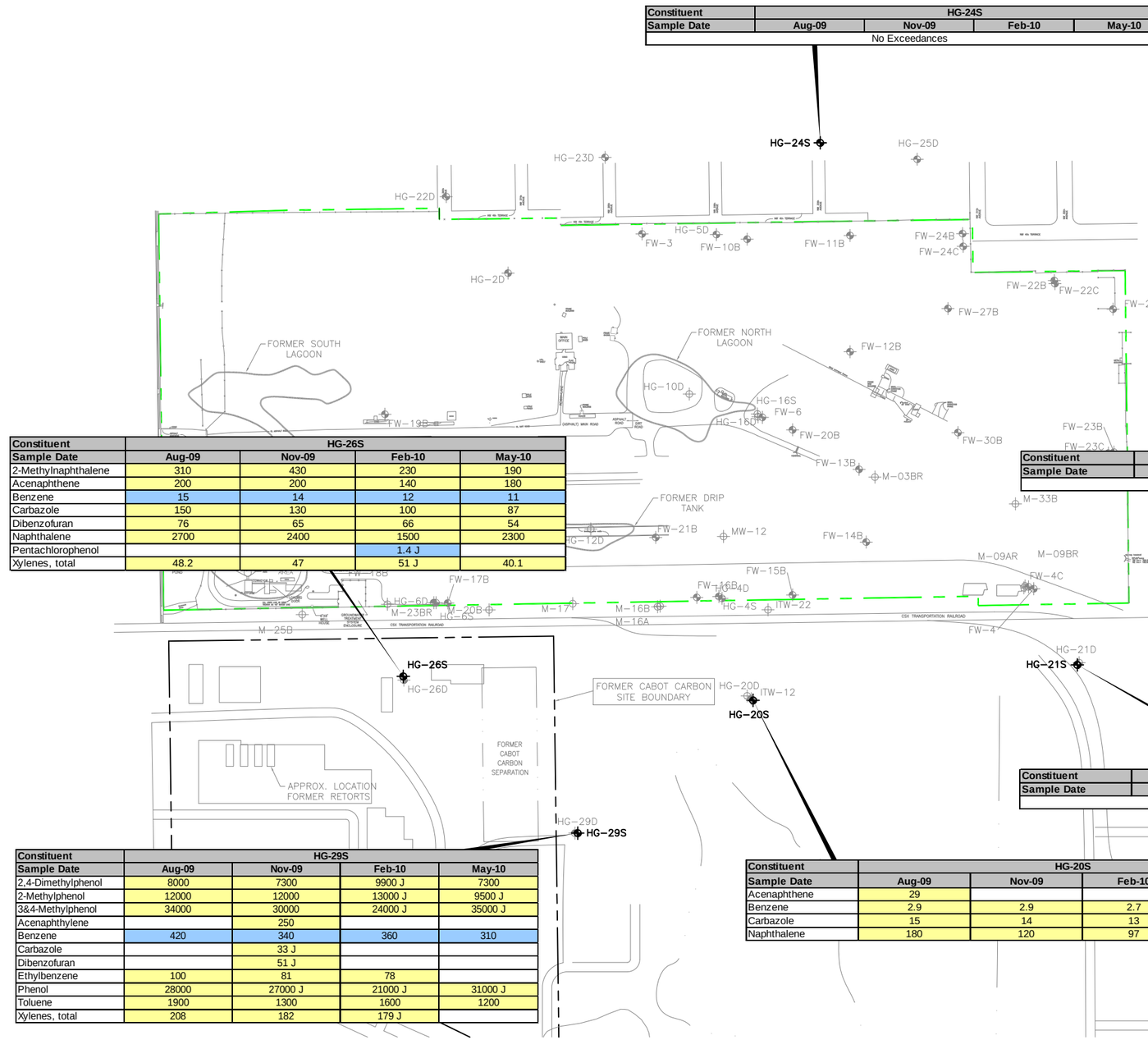

Constituent	HG-24S			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
No Exceedances				

Constituent	HG-26S			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
2-Methylnaphthalene	310	430	230	190
Acenaphthene	200	200	140	180
Benzene	15	14	12	11
Carbazole	150	130	100	87
Dibenzofuran	76	65	66	54
Naphthalene	2700	2400	1500	2300
Pentachlorophenol			1.4 J	
Xylenes, total	48.2	47	51 J	40.1

Constituent	HG-27S			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
No Exceedances				

Constituent	HG-21S			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
No Exceedances				

Constituent	HG-29S			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
2,4-Dimethylphenol	8000	7300	9900 J	7300
2-Methylphenol	12000	12000	13000 J	9500 J
3&4-Methylphenol	34000	30000	24000 J	35000 J
Acenaphthylene		250		
Benzene	420	340	360	310
Carbazole		33 J		
Dibenzofuran		51 J		
Ethylbenzene	100	81	78	
Phenol	28000	27000 J	21000 J	31000 J
Toluene	1900	1300	1600	1200
Xylenes, total	208	182	179 J	

Constituent	HG-20S			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
Acenaphthene	29			28
Benzene	2.9	2.9	2.7	2.8
Carbazole	15	14	13	19
Naphthalene	180	120	97	190

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)
(3) 3-METHYLPHENOL AND 4-METHYLPHENOL CANNOT BE QUANTIFIED SEPERATELY USING USEPA SW-846 METHOD 8270C.

N

LEGEND

HG-6D — HAWTHORN MONITORING WELL

SUBJECT SITE PROPERTY LINE (APPROXIMATE)

FORMER CABOT CARBON SITE BOUNDARY

STANDARDS

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)
Organic Chemicals		
2,4-Dimethylphenol	-	140
2-Methylnaphthalene	-	28
2-Methylphenol	-	35
3&4-Methylphenol	-	3.5[3]
Acenaphthene	-	20
Acenaphthylene	-	210
Anthracene	-	2100
Benzene	5	1
Carbazole	-	1.8
Dibenzofuran	-	28
Ethylbenzene	700	30
Fluoranthene	-	280
Fluorene	-	280
Naphthalene	-	14
Pentachlorophenol	1	1
Phenanthrene	-	210
Phenol	-	10
Pyrene	-	210
Toluene	10000	40
Xylene (total)	1000	20

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	08/18/10
CHKD:	KC	DATE:	08/18/10
APPD:	AMG	DATE:	08/18/10
SCALE:	AS SHOWN		
ISSUE DATE:			

FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

UPPER HAWTHORN GROUP
MONITORING WELLS
ORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 7a

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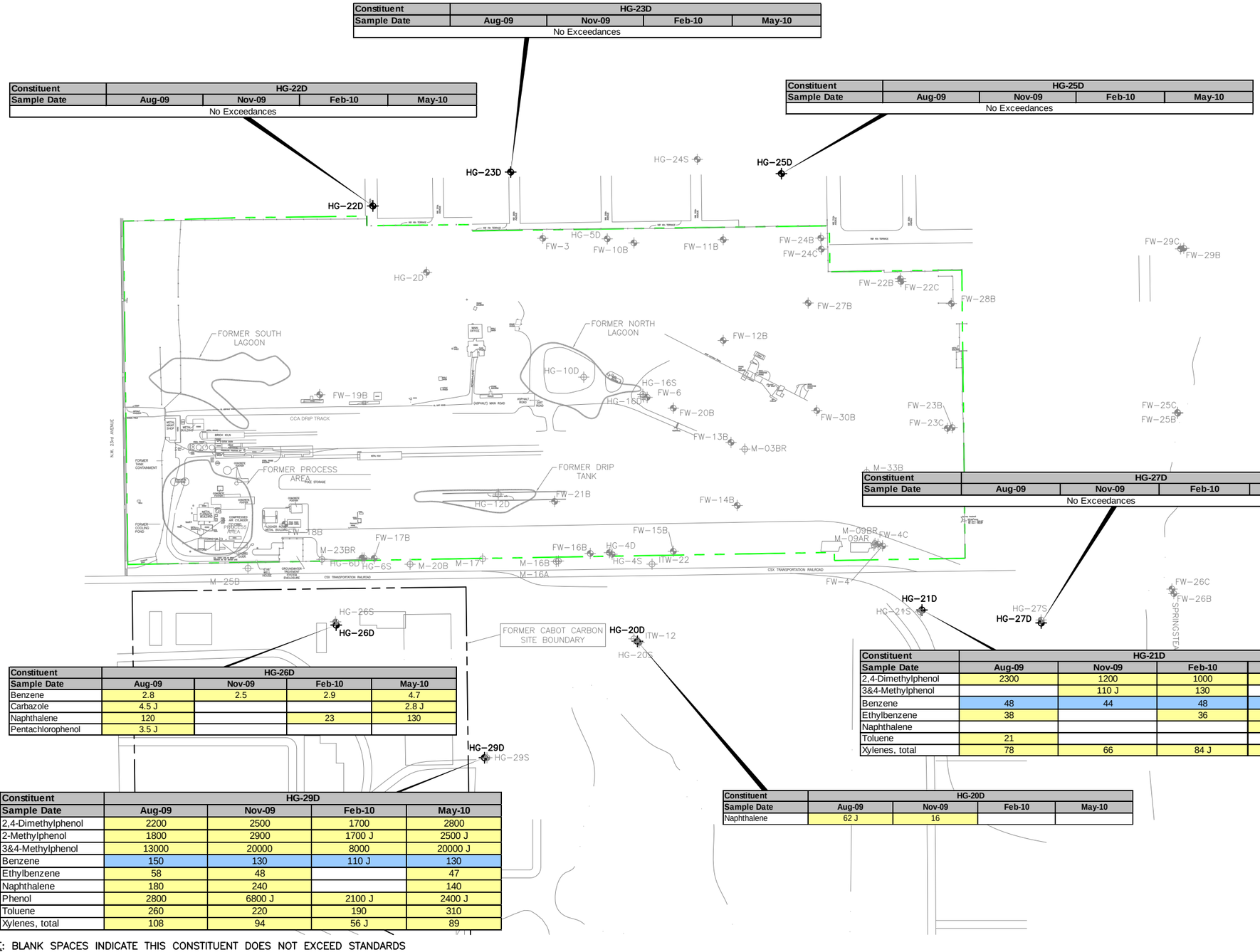

Constituent	HG-23D			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
No Exceedances				

Constituent	HG-22D			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
No Exceedances				

Constituent	HG-25D			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
No Exceedances				

Constituent	HG-27D			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
No Exceedances				

Constituent	HG-26D			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
Benzene	2.8	2.5	2.9	4.7
Carbazole	4.5 J			2.8 J
Naphthalene	120		23	130
Pentachlorophenol	3.5 J			

Constituent	HG-21D			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
2,4-Dimethylphenol	2300	1200	1000	2400
3&4-Methylphenol		110 J	130	
Benzene	48	44	48	49
Ethylbenzene	38		36	37
Naphthalene				110
Toluene	21			
Xylenes, total	78	66	84 J	85

Constituent	HG-29D			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
2,4-Dimethylphenol	2200	2500	1700	2800
2-Methylphenol	1800	2900	1700 J	2500 J
3&4-Methylphenol	13000	20000	8000	20000 J
Benzene	150	130	110 J	130
Ethylbenzene	58	48		47
Naphthalene	180	240		140
Phenol	2800	6800 J	2100 J	2400 J
Toluene	260	220	190	310
Xylenes, total	108	94	56 J	89

Constituent	HG-20D			
Sample Date	Aug-09	Nov-09	Feb-10	May-10
Naphthalene	62 J	16		

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
1			
2			
3			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
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(3) 3-METHYLPHENOL AND 4-METHYLPHENOL CANNOT BE QUANTIFIED SEPERATELY USING USEPA SW-846 METHOD 8270C.

N

LEGEND

HG-6D — HAWTHORN MONITORING WELL

SUBJECT SITE PROPERTY LINE (APPROXIMATE)

FORMER CABOT CARBON SITE BOUNDARY

STANDARDS

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)
Organic Chemicals		
2,4-Dimethylphenol	-	140
2-Methylnaphthalene	-	28
2-Methylphenol	-	35
3&4-Methylphenol	-	3.5[3]
Acenaphthene	-	20
Acenaphthylene	-	210
Anthracene	-	2100
Benzene	5	1
Carbazole	-	1.8
Dibenzofuran	-	28
Ethylbenzene	700	30
Fluoranthene	-	280
Fluorene	-	280
Naphthalene	-	14
Pentachlorophenol	1	1
Phenanthrene	-	210
Phenol	-	10
Pyrene	-	210
Toluene	10000	40
Xylene (total)	1000	20

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	08/18/10
CHKD:	KC	DATE:	08/18/10
APPD:	AMG	DATE:	08/18/10
SCALE:	AS SHOWN		
ISSUE DATE:			

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FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

LOWER HAWTHORN GROUP
MONITORING WELLS
ORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 7b

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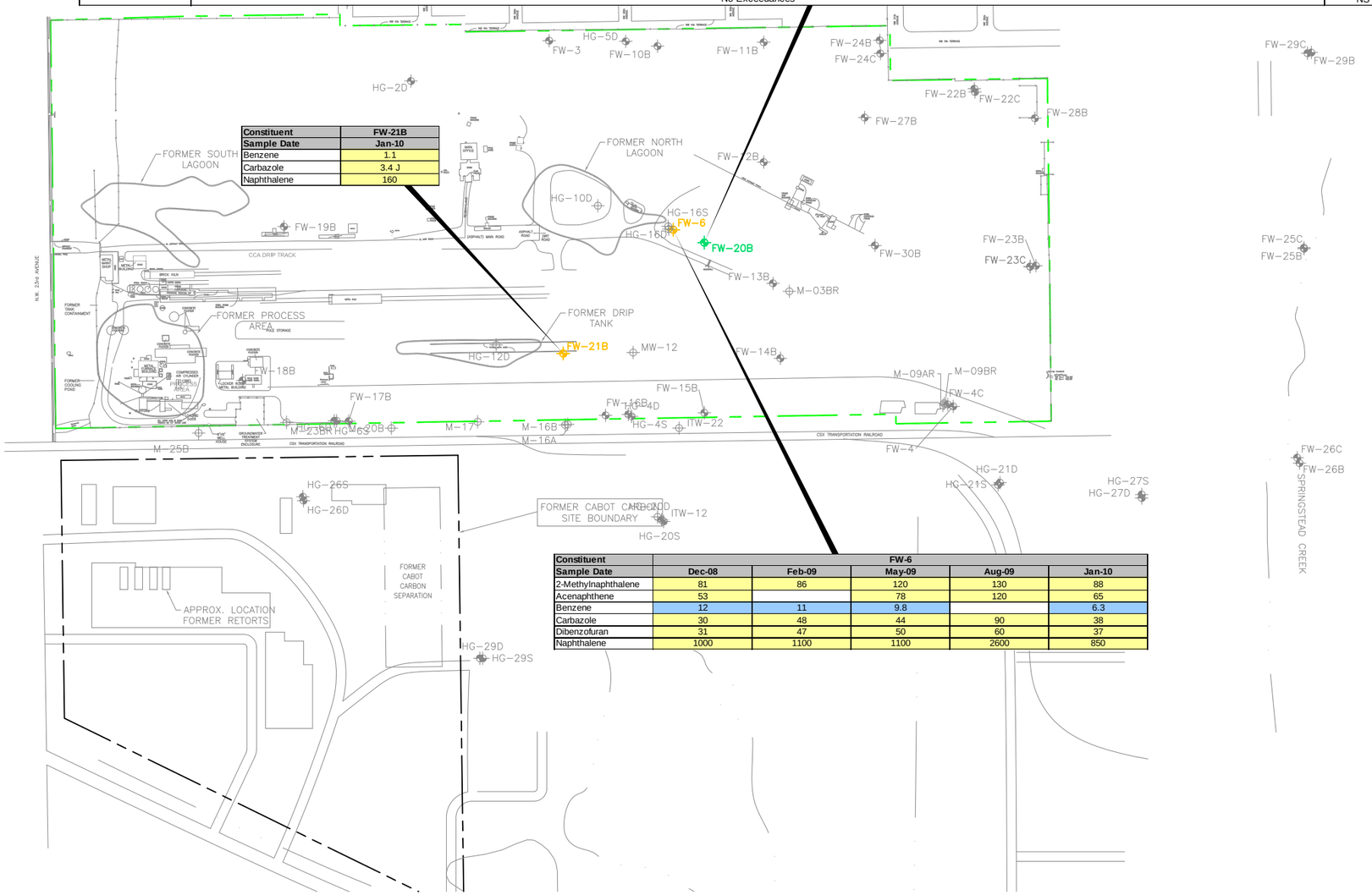
Constituent	FW-20B																
Sample Date	**Mar-06**	**Jul-06**	**Sep-06**	**Dec-06**	**Mar-07**	**Jun-07**	**Sep-07**	**Dec-07**	**Feb-08**	**Jun-08**	**Sep-08**	**Dec-08**	**Feb-09**	**May-09**	**Aug-09**	**Jan-10**	**May-10**
	Zone 1																
2-Methylnaphthalene		62	49	35	30								29	42	60	53	110
Acenaphthene	54	63	65	59	58	60	39	58	30	42	44	42	53	74	60	47	63
Benzene	2.4	5.3	5.9	4.5	3.7	3.6	3.7	2.5	2.6	1.9	3	3.5	2.9	3.6	3.3	7.3	5.2
Carbazole	26	22	25	17	14	9	3.4 J									6.2	14
Dibenzofuran		33	37	35	34	35		33						36	29	29	35
Naphthalene		650	720	510	550	450	380	210	450	260	310	420	730	1000	870	690	1100
	Zone 2																
Acenaphthene		31	40	43	44	41	32	50		42	34	31	38	42	40	33	39
Benzene		3.1	2.5	2.9	2.7	2.2	1.9	1.3									1.1
Carbazole	2.1 J	9.6	13	12	10	5.4 J	2.7 J										
Naphthalene	53	370	140	120	140	85	94	99	49	100	58	73	96	150	170	63	240
	Zone 3																
	No Exceedances															NS	NS
	Zone 4																
	No Exceedances															NS	NS



Constituent	FW-21B
Sample Date	Jan-10
Benzene	1.1
Carbazole	3.4 J
Naphthalene	160

Constituent	FW-6				
Sample Date	Dec-08	Feb-09	May-09	Aug-09	Jan-10
2-Methylnaphthalene	81	86	120	130	88
Acenaphthene	53		78	120	65
Benzene	12	11	9.8		6.3
Carbazole	30	48	44	90	38
Dibenzofuran	31	47	50	60	37
Naphthalene	1000	1100	1100	2600	850

N

LEGEND

- FW-20B — FLORIDAN WESTBAY MONITORING WELL
- FW-25B — FLORIDAN STANDARD CONSTRUCTION MONITORING WELL
- SUBJECT SITE PROPERTY LINE (APPROXIMATE)
- FORMER CABOT CARBON SITE BOUNDARY
- NS — NOT SAMPLED

STANDARDS

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)
Organic Chemicals		
2,4-Dimethylphenol	-	140
2-Methylnaphthalene	-	28
2-Methylphenol	-	35
3&4-Methylphenol	-	3.5[3]
Acenaphthene	-	20
Acenaphthylene	-	210
Anthracene	-	2100
Benzene	5	1
Carbazole	-	1.8
Dibenzofuran	-	28
Ethylbenzene	700	30
Fluoranthene	-	280
Fluorene	-	280
Naphthalene	-	14
Pentachlorophenol	1	1
Phenanthrene	-	210
Phenol	-	10
Pyrene	-	210
Toluene	10000	40
Xylene (total)	1000	20

0 400 800 FEET

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
1			
2			
3			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
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(3) 3-METHYLPHENOL AND 4-METHYLPHENOL CANNOT BE QUANTIFIED SEPERATELY USING USEPA SW-846 METHOD 8270C.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	08/19/10
CHKD:	KC	DATE:	08/19/10
APPD:	AMG	DATE:	08/19/10
SCALE:	AS SHOWN		
ISSUE DATE:			

FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

FLORIDAN SOURCE AREA
MONITORING WELLS
ORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 8

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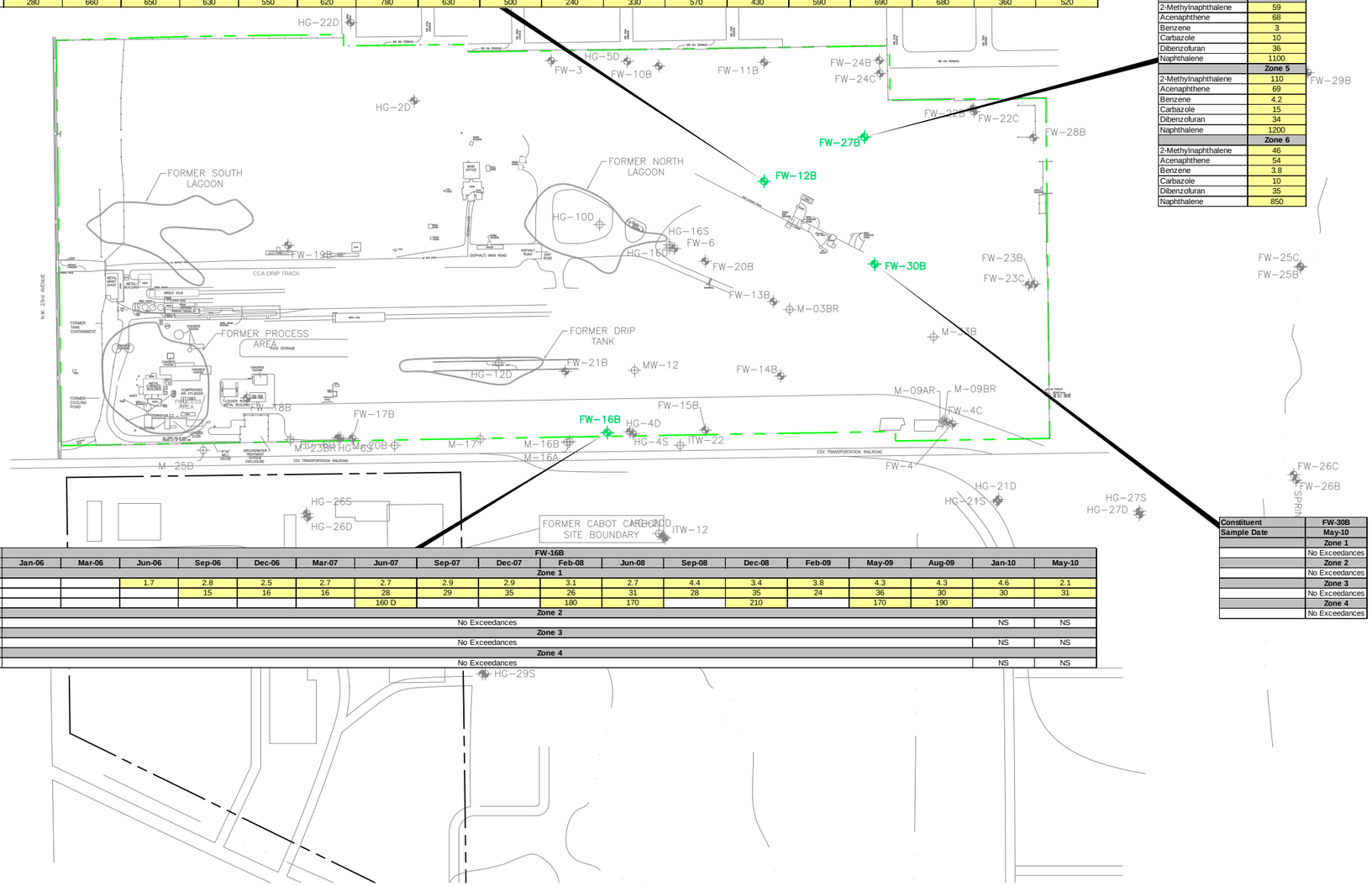
Constituent	FW-12B																	
Sample Date	Jan-06	Mar-06	Jul-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Feb-08	Jul-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Jan-10	May-10
Zone 1																		
Benzene			1.5		1.6	1.6	1.7	2	2		1.3	2.2	2.8	1.5	2.4	2.8	2.9	3.1
2-Methylphenol								38										
Naphthalene			49	40	45	44	46	47			48	55	20	65	85	95	76	86
Zone 2																		
Benzene										1.2		1.1	1.3	1.2		1.1		
Naphthalene			15		17	15	16	21	21 B									
Zone 3																		
2-Methylnaphthalene							44	80	50		71	41 J	49	36	44	98	58	75
Acenaphthene	29	28	52	35	33	35	43	56	54	26	53	46 J	43	64	52	69	54	63
Benzene	1.7				2.1	3	4	3.4	3.9	2.7	2.7	5.3	4.6	2.3	4	5	5.6	5.2
Carbazole	4.6 J	1.9 J									3.4 J		2.5 J		3.9 J	8.1	9.9	16
Dibenzofuran			29						29									30
Naphthalene	160	380	500	370	410	540	780	830	550	760	870	770	280	750	950	970	750	870
Zone 4																		
2-Methylnaphthalene			32	31	33	32	41	47	32		29							
Acenaphthene	40	45	61	55	55	52	60	55	53	29 J	49	45	45	44	44	44	32	39
Benzene	2.2	3.1	4.2		4.1	3.5	3.6	3.1	3.9	2.9	2	2.7	4	1.8	2.8	3.2	3.5	3.3
Carbazole	16	23	32	34	31	31	32	34	29	13 J	25	20 J	21	20	17	18	15	15
Dibenzofuran				29	33	30	38	35	35		32		33					
Naphthalene	280	660	650	630	550	620	780	630	500	240	330	570	430	590	690	680	360	520

Constituent	FW-27B
Sample Date	Jun-10
	Zone 1
Acenaphthene	39
Benzene	2.1
Naphthalene	560
	Zone 2
2-Methylnaphthalene	130
Acenaphthene	98
Benzene	4.1
Carbazole	24
Dibenzofuran	60
Naphthalene	1700
	Zone 3
2-Methylnaphthalene	80
Acenaphthene	62
Benzene	5.7
Carbazole	11
Dibenzofuran	38
Naphthalene	1100
	Zone 4
2-Methylnaphthalene	59
Acenaphthene	68
Benzene	3
Carbazole	10
Dibenzofuran	36
Naphthalene	1100
	Zone 5
2-Methylnaphthalene	110
Acenaphthene	69
Benzene	4.2
Carbazole	15
Dibenzofuran	34
Naphthalene	1200
	Zone 6
2-Methylnaphthalene	46
Acenaphthene	54
Benzene	3.8
Carbazole	10
Dibenzofuran	35
Naphthalene	850



Constituent	FW-30B
Sample Date	May-10
	Zone 1
	No Exceedances
	Zone 2
	No Exceedances
	Zone 3
	No Exceedances
	Zone 4
	No Exceedances

Constituent	FW-16B																	
Sample Date	Jan-06	Mar-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Jan-10	May-10
Zone 1																		
Benzene			1.7	2.8	2.5	2.7	2.7	2.9	2.9	3.1	2.7	4.4	3.4	3.8	4.3	4.3	4.6	2.1
Naphthalene				15	16	16	28	29	35	26	31	28	35	24	36	30	30	31
2,4-Dimethylphenol							160 D			180	170		210		170	190		
Zone 2																		
No Exceedances																	NS	NS
Zone 3																		
No Exceedances																	NS	NS
Zone 4																		
No Exceedances																	NS	NS

LEGEND

- FW-16B — FLORIDAN WESTBAY MONITORING WELL
- SUBJECT SITE PROPERTY LINE (APPROXIMATE)
- FORMER CABOT CARBON SITE BOUNDARY
- NS — NOT SAMPLED

STANDARDS

Constituent	Federal MCL(1) (ug/L)	Florida GCTL(2) (ug/L)
Organic Chemicals		
2,4-Dimethylphenol	-	140
2-Methylnaphthalene	-	28
2-Methylphenol	-	35
3&4-Methylphenol	-	3.5(3)
Acenaphthene	-	20
Acenaphthylene	-	210
Anthracene	-	2100
Benzene	5	1
Carbazole	-	1.8
Dibenzofuran	-	28
Ethylbenzene	700	30
Fluoranthene	-	280
Fluorene	-	280
Naphthalene	-	14
Pentachlorophenol	1	1
Phenanthrene	-	210
Phenol	-	10
Pyrene	-	210
Toluene	10000	40
Xylene (total)	1000	20

0 400 800 FEET

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)
(3) 3-METHYLPHENOL AND 4-METHYLPHENOL CANNOT BE QUANTIFIED SEPERATELY USING USEPA SW-846 METHOD 8270C.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

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ISSUE DATE:			

FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

FLORIDAN TRANSECT AREA
MONITORING WELLS
ORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 9

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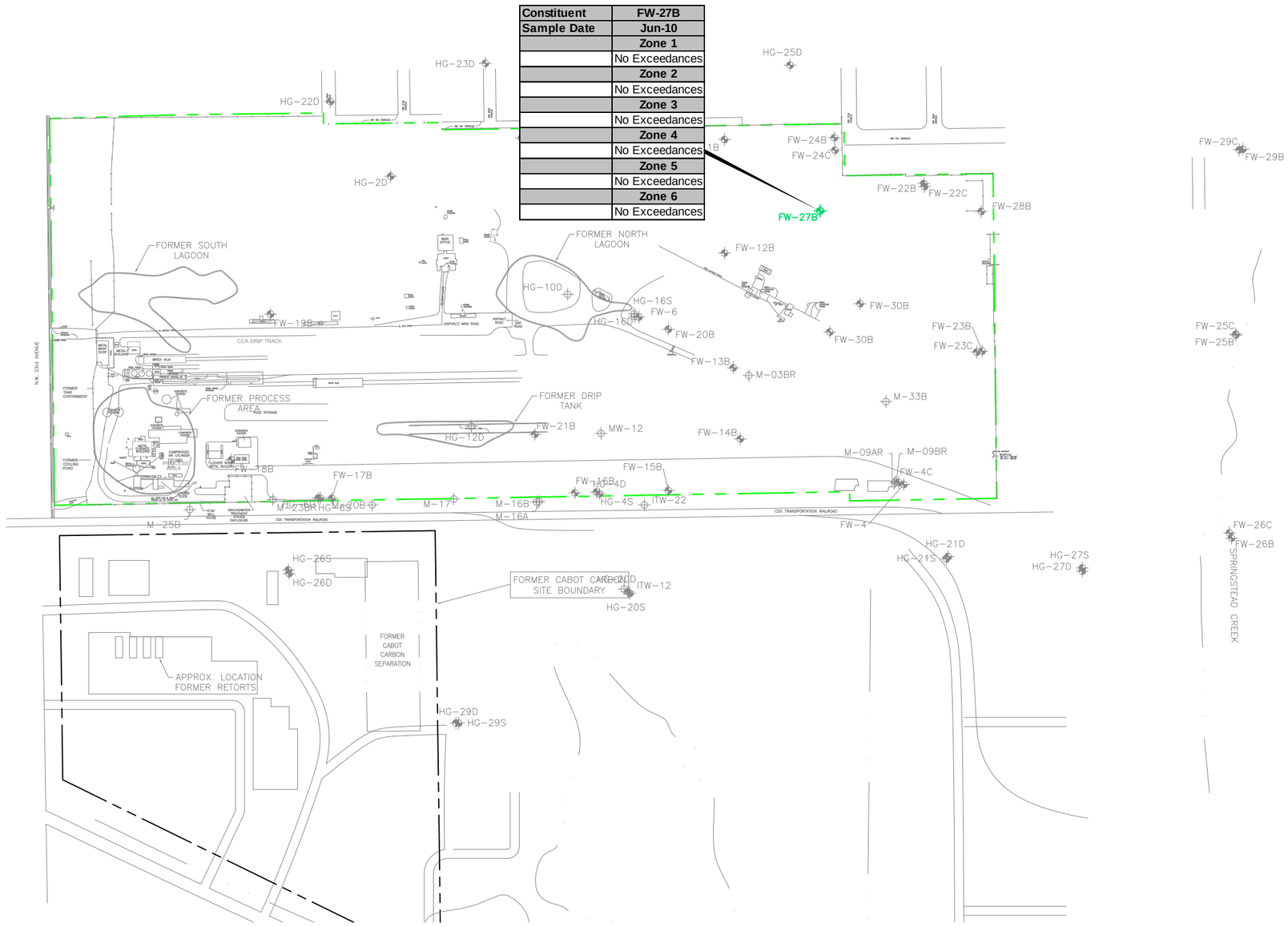

Constituent	FW-27B
Sample Date	Jun-10
	Zone 1
	No Exceedances
	Zone 2
	No Exceedances
	Zone 3
	No Exceedances
	Zone 4
	No Exceedances
	Zone 5
	No Exceedances
	Zone 6
	No Exceedances

LEGEND

FW-16B — FLORIDAN WESTBAY MONITORING WELL

SUBJECT SITE PROPERTY LINE (APPROXIMATE)

FORMER CABOT CARBON SITE BOUNDARY

STANDARDS

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)
Metals		
Arsenic, dissolved	10	10
Arsenic, total	10	10

0 400 800 FEET

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
1			
2			
3			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

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APPD:	AMG	DATE:	08/19/10
SCALE:	AS SHOWN		
ISSUE DATE:			

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CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

FLORIDAN TRANSECT AREA
MONITORING WELLS
INORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 10

q:\projects\beazer projects\gainesville\cadd\1sa gw comp report 2010\figure-10.dwg Last Saved By: Kchintella 10/14/2010 9:51 AM Plotted By: Kendra L. Chintella 10/14/2010 9:51 AM Scale: 1:1

Constituent	FW-24B									
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Jun-10
	Zone 1										
	No Exceedances										
	Zone 2										
	No Exceedances										
	Zone 3										
	No Exceedances										
	Zone 4										
	No Exceedances										

Constituent	FW-22C										
Sample Date	Jun-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Mar-10
	Zone 1										
	No Exceedances										
	Zone 2										
	No Exceedances										
	Zone 3										
	No Exceedances										

Constituent	FW-24C										
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Feb-10
	Zone 1										
	No Exceedances										
	Zone 2										
	No Exceedances										
	Zone 3										
	No Exceedances										
	Zone 4										
	No Exceedances										

Constituent	FW-22B																
Sample Date	May-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Feb-10	Jun-10
	Zone 1																
	No Exceedances																
	Zone 2																
Acenaphthene		20									21			21	23		26
Naphthalene											17			21	58	49	50 J
	Zone 3																
Acenaphthene											29	21	21	25	23	22	23
Naphthalene										24	20	31	48	120	110	69	82 J
	Zone 4																
Acenaphthene													23	21			
Phenol		20															

Constituent	FW-28B	
Sample Date	Mar-10	Jun-10
	Zone 1	
Phenol	12 J	
	Zone 2	
	No Exceedences	
	Zone 3	
	No Exceedences	
	Zone 4	
	No Exceedences	

Constituent	FW-23C										
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Mar-10
	Zone 1										
	No Exceedances										
	Zone 2										
	No Exceedances										
	Zone 3										
	NS	NS	No Exceedances								

Constituent	FW-4			
Sample Date	Dec-08	May-09	Nov-09	Feb-10
	No Exceedances			

Constituent	FW-23B															
Sample Date	May-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	May-10
	Zone 1															
	No Exceedances															
	Zone 2															
	No Exceedances															
	Zone 3															
	No Exceedances															
	Zone 4															
Phenol								20								

Constituent	FW-4C										
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Feb-10
	Zone 1										
	No Exceedences										
	Zone 2										
Phenol		18									
	Zone 3										
	No Exceedences										

LEGEND

- FW-22B — FLORIDAN WESTBAY MONITORING WELL
- FW-4 — FLORIDAN STANDARD CONSTRUCTION MONITORING WELL
- SUBJECT SITE PROPERTY LINE (APPROXIMATE)
- FORMER CABOT CARBON SITE BOUNDARY

STANDARDS

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)
Organic Chemicals		
2,4-Dimethylphenol	-	140
2-Methylnaphthalene	-	28
2-Methylphenol	-	35
3&4-Methylphenol	-	3.5[3]
Acenaphthene	-	20
Acenaphthylene	-	210
Anthracene	-	2100
Benzene	5	1
Carbazole	-	1.8
Dibenzofuran	-	28
Ethylbenzene	700	30
Fluoranthene	-	280
Fluorene	-	280
Naphthalene	-	14
Pentachlorophenol	1	1
Phenanthrene	-	210
Phenol	-	10
Pyrene	-	210
Toluene	10000	40
Xylene (total)	1000	20

0 400 800 FEET

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)
(3) 3-METHYLPHENOL AND 4-METHYLPHENOL CANNOT BE QUANTIFIED SEPERATELY USING USEPA SW-846 METHOD 8270C.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

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ISSUE DATE:			

FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

FLORIDAN BOUNDARY
MONITORING WELLS
ORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 11

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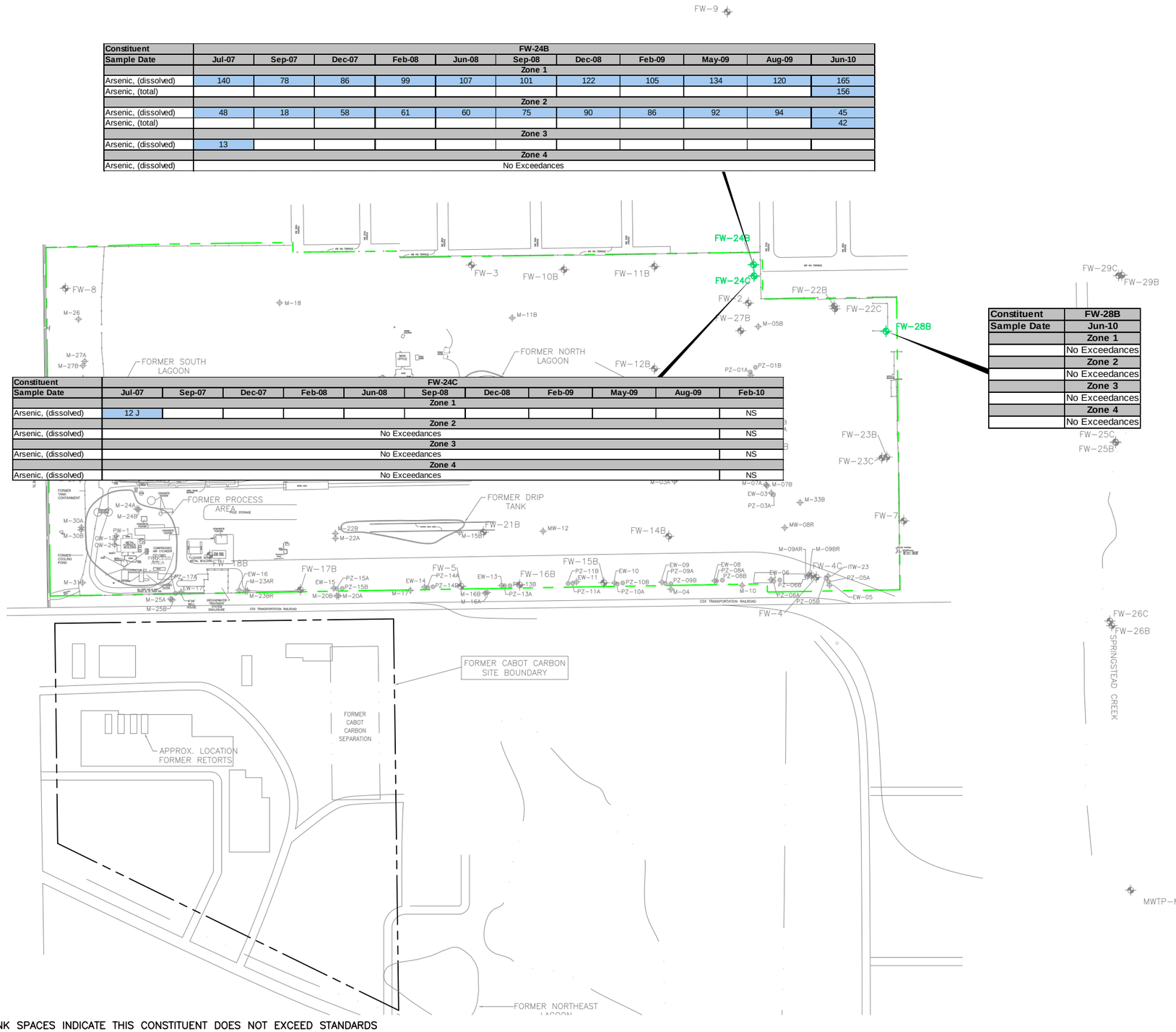
Constituent	FW-24B										
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Jun-10
	Zone 1										
Arsenic, (dissolved)	140	78	86	99	107	101	122	105	134	120	165
Arsenic, (total)											156
	Zone 2										
Arsenic, (dissolved)	48	18	58	61	60	75	90	86	92	94	45
Arsenic, (total)											42
	Zone 3										
Arsenic, (dissolved)	13										
	Zone 4										
Arsenic, (dissolved)	No Exceedances										

Constituent	FW-24C										
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Feb-10
	Zone 1										
Arsenic, (dissolved)	12 J										NS
	Zone 2										
Arsenic, (dissolved)	No Exceedances										NS
	Zone 3										
Arsenic, (dissolved)	No Exceedances										NS
	Zone 4										
Arsenic, (dissolved)	No Exceedances										NS

Constituent	FW-28B
Sample Date	Jun-10
	Zone 1
	No Exceedances
	Zone 2
	No Exceedances
	Zone 3
	No Exceedances
	Zone 4
	No Exceedances



LEGEND

FW-22B — FLORIDAN WESTBAY MONITORING WELL

SUBJECT SITE PROPERTY LINE (APPROXIMATE)

FORMER CABOT CARBON SITE BOUNDARY

NS — NOT SAMPLED

STANDARDS

Constituent	Federal MCL(1) (ug/L)	Florida GCTL(2) (ug/L)
Metals		
Arsenic, dissolved	10	10
Arsenic, total	10	10

0 400 800 FEET

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

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APPD:	AMG	DATE:	08/19/10
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2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

FLORIDAN BOUNDARY
MONITORING WELLS
INORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 12

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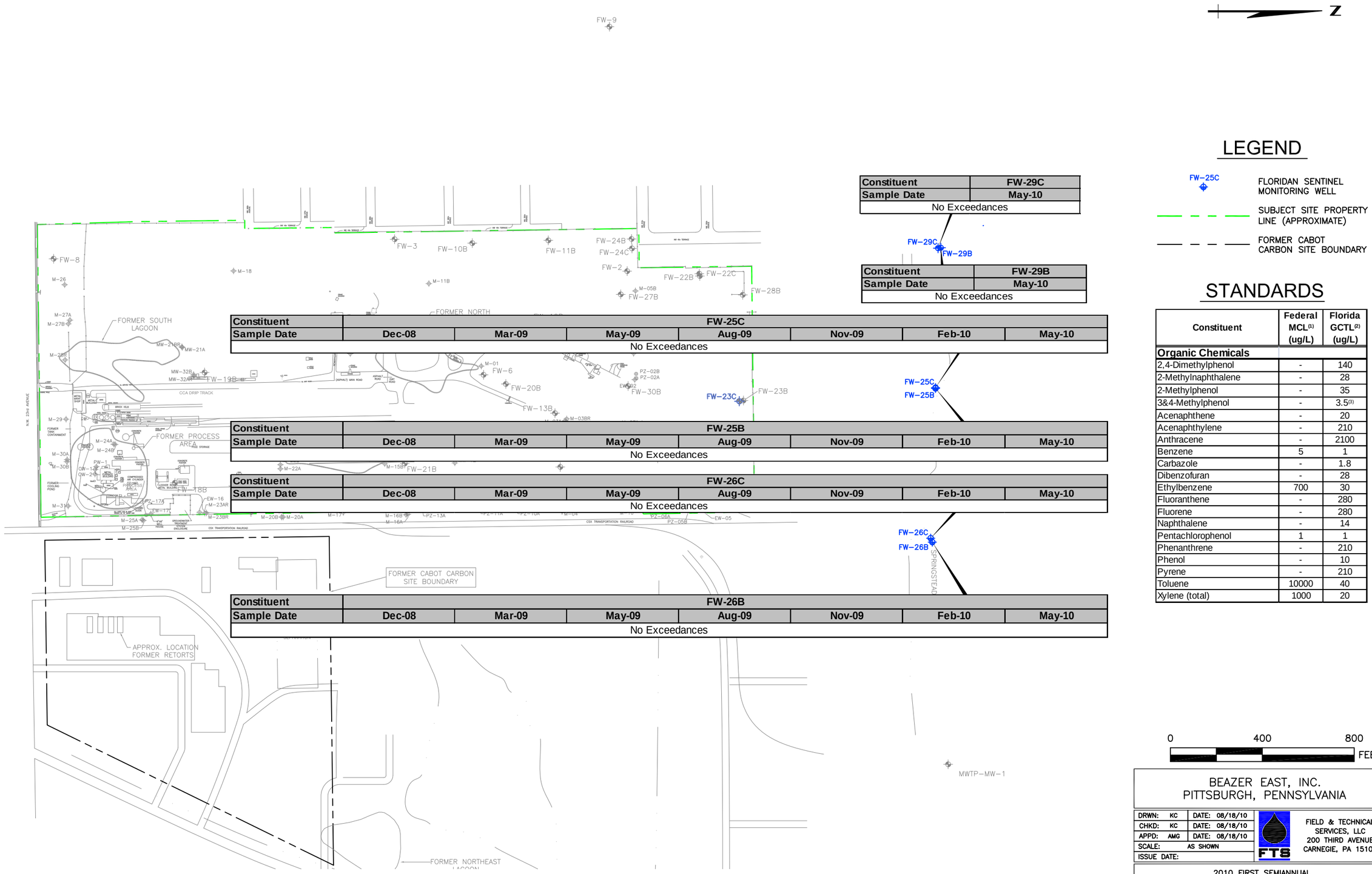

Constituent	FW-29C
Sample Date	May-10
No Exceedances	

Constituent	FW-29B
Sample Date	May-10
No Exceedances	

Constituent	FW-25C						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
No Exceedances							

Constituent	FW-25B						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
No Exceedances							

Constituent	FW-26C						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
No Exceedances							

Constituent	FW-26B						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
No Exceedances							

LEGEND

- FW-25C — FLORIDAN SENTINEL MONITORING WELL
- SUBJECT SITE PROPERTY LINE (APPROXIMATE)
- FORMER CABOT CARBON SITE BOUNDARY

STANDARDS

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)
Organic Chemicals		
2,4-Dimethylphenol	-	140
2-Methylnaphthalene	-	28
2-Methylphenol	-	35
3&4-Methylphenol	-	3.5[3]
Acenaphthene	-	20
Acenaphthylene	-	210
Anthracene	-	2100
Benzene	5	1
Carbazole	-	1.8
Dibenzofuran	-	28
Ethylbenzene	700	30
Fluoranthene	-	280
Fluorene	-	280
Naphthalene	-	14
Pentachlorophenol	1	1
Phenanthrene	-	210
Phenol	-	10
Pyrene	-	210
Toluene	10000	40
Xylene (total)	1000	20

0 400 800 FEET

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)
(3) 3-METHYLPHENOL AND 4-METHYLPHENOL CANNOT BE QUANTIFIED SEPERATELY USING USEPA SW-846 METHOD 8270C.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

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2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

SENTINEL MONITORING WELLS
ORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: OM045010
DRAWING NUMBER
FIGURE 13

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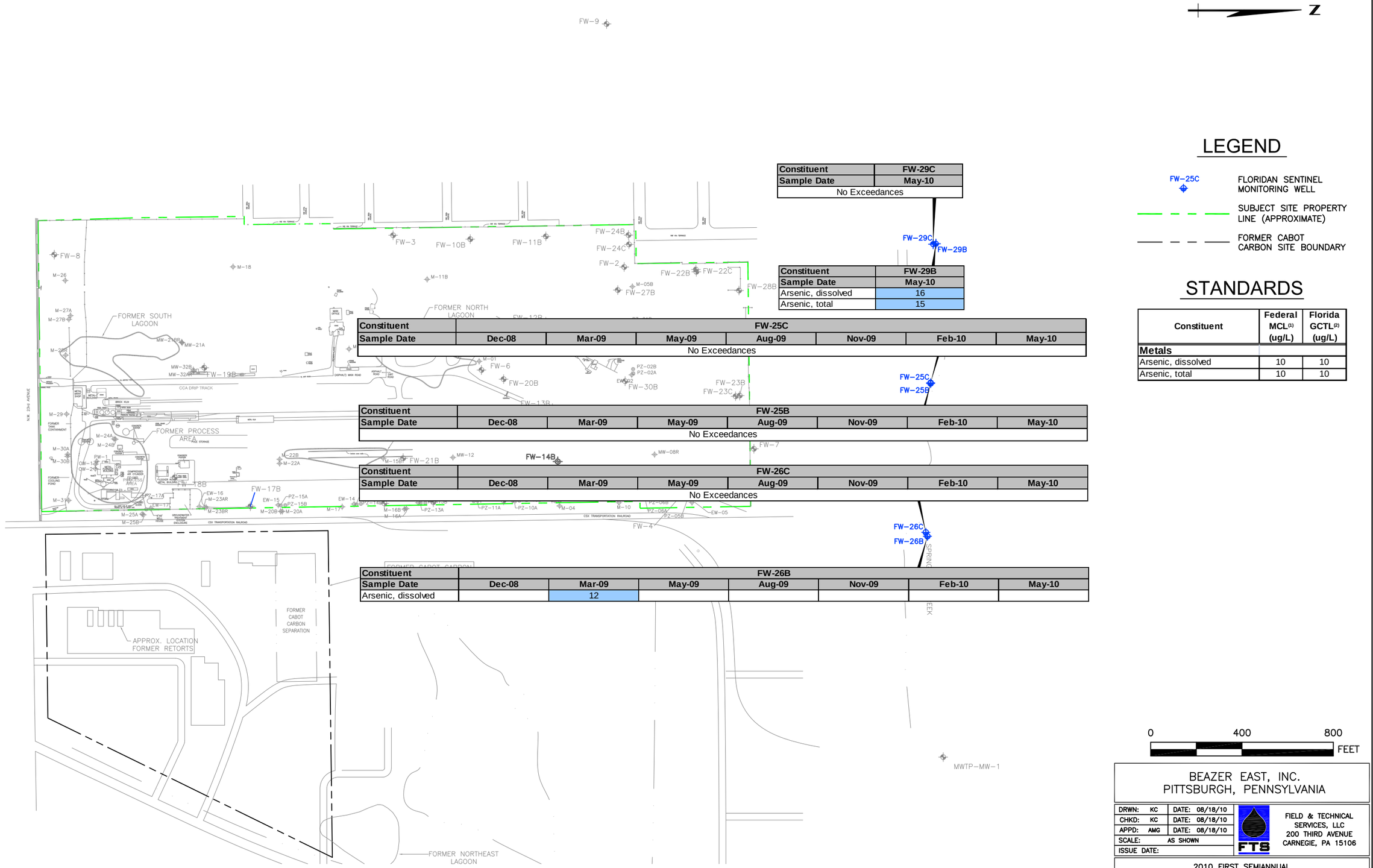

Constituent	FW-29C
Sample Date	May-10
No Exceedances	

Constituent	FW-29B
Sample Date	May-10
Arsenic, dissolved	16
Arsenic, total	15

Constituent	FW-25C						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
No Exceedances							

Constituent	FW-25B						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
No Exceedances							

Constituent	FW-26C						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
No Exceedances							

Constituent	FW-26B						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
Arsenic, dissolved		12					

N

LEGEND

FW-25C — FLORIDAN SENTINEL MONITORING WELL

SUBJECT SITE PROPERTY LINE (APPROXIMATE)

FORMER CABOT CARBON SITE BOUNDARY

STANDARDS

Constituent	Federal MCL[1] (ug/L)	Florida GCTL[2] (ug/L)
Metals		
Arsenic, dissolved	10	10
Arsenic, total	10	10

0 400 800 FEET

NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

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CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

SENTINEL MONITORING WELLS
INORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 14

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Constituent	FW-27B
Sample Date	Jun-10
	Zone 1
Acenaphthene	39
Benzene	2.1
Naphthalene	560
	Zone 2
2-Methylnaphthalene	130
Acenaphthene	98
Benzene	4.1
Carbazole	24
Dibenzofuran	60
Naphthalene	1700
	Zone 3
2-Methylnaphthalene	80
Acenaphthene	62
Benzene	5.7
Carbazole	11
Dibenzofuran	38
Naphthalene	1100
	Zone 4
2-Methylnaphthalene	59
Acenaphthene	68
Benzene	3
Carbazole	10
Dibenzofuran	36
Naphthalene	1100
	Zone 5
2-Methylnaphthalene	110
Acenaphthene	69
Benzene	4.2
Carbazole	15
Dibenzofuran	34
Naphthalene	1200
	Zone 6
2-Methylnaphthalene	46
Acenaphthene	54
Benzene	3.8
Carbazole	10
Dibenzofuran	35
Naphthalene	850

Constituent	FW-24B										
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Jun-10
	Zone 1										
	No Exceedances										
	Zone 2										
	No Exceedances										
	Zone 3										
	No Exceedances										
	Zone 4										
	No Exceedances										

Constituent	FW-24C									
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Feb-10
	Zone 1										
	No Exceedances										
	Zone 2										
	No Exceedances										
	Zone 3										
	No Exceedances										
	Zone 4										
	No Exceedances										

Constituent	FW-22B															
Sample Date	May-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Feb-10	Jun-10
	Zone 1																
	No Exceedances																
	Zone 2																
Acenaphthene		20									21			21	23		26
Naphthalene											17			21	58	49	50 J
	Zone 3																
Acenaphthene											29	21	21	25	23	22	23
Naphthalene									24		20	31	48	120	110	69	82 J
	Zone 4																
Acenaphthene													23	21			
Phenol		20															

Constituent	FW-22C										
Sample Date	Jun-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Mar-10
	Zone 1										
	No Exceedances										
	Zone 2										
	No Exceedances										
	Zone 3										
	No Exceedances										

Constituent	FW-28B	
Sample Date	Mar-10	Jun-10
	Zone 1	
Phenol	12 J	
	Zone 2	
	No Exceedances	
	Zone 3	
	No Exceedances	
	Zone 4	
	No Exceedances	

Constituent	FW-29C
Sample Date	May-10
	No Exceedances

Constituent	FW-29B
Sample Date	May-10
	No Exceedances

Constituent	FW-12B																
Sample Date	Jan-06	Mar-06	Jul-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Feb-08	Jul-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Jan-10	May-10
										Zone 1								
Benzene			1.5		1.6	1.6	1.7	2	2		1.3	2.2	2.8	1.5	2.4	2.8	2.9	3.1
2-Methylphenol								38										
Naphthalene			49	40	45	44	46	47			48	55	20	65	85	95	76	86
										Zone 2								
Benzene										1.2		1.1	1.3	1.2		1.1		
Naphthalene			15		17	15	16	21	21 B									
										Zone 3								
2-Methylnaphthalene							44	80	50		71	41 J	49	36	44	98	58	75
Acenaphthene	29	28	52	35	33	35	43	56	54	26	53	46 J	43	64	52	69	54	63
Benzene	1.7		3		2.1	3	4	3.4	3.9	2.7	2.7	5.3	4.6	2.3	4	5	5.6	5.2
Carbazole	4.6 J	1.9 J									3.4 J		2.5 J		3.9 J	8.1	9.9	16
Dibenzofuran			29						29								30	
Naphthalene	160	380	500	370	410	540	780	830	550	760	870	770	280	750	950	970	750	870
										Zone 4								
2-Methylnaphthalene			32	31	33	32	41	47	32		29							
Acenaphthene	40	45	61	55	55	52	60	55	53	29 J	49	45	45	44	44	44	32	39
Benzene	2.3	3.1	4.2		4.1	3.5	3.6	3.1	3.9	2	2.7	4	1.8	2.8	3.2	3.5	3.3	
Carbazole	16	23	32	34	31	31	32	34	29	13 J	25	20 J	21	20	17	18	15	15
Dibenzofuran				29	33	30	36	35	35		32		33					
Naphthalene	280	660	650	630	550	620	780	630	500	240	330	570	430	590	690	680	360	520

Constituent	FW-6				
Sample Date	Dec-08	Feb-09	May-09	Aug-09	Jan-10
2-Methylnaphthalene	81	86	120	130	88
Acenaphthene	53		78	120	65
Benzene	12	11	9.8		6.3
Carbazole	30	48	44	90	38
Dibenzofuran	31	47	50	60	37
Naphthalene	1000	1100	1100	2600	850

Constituent	FW-21B
Sample Date	Jan-10
Benzene	1.1
Carbazole	3.4 J
Naphthalene	160

Constituent	FW-16B																
Sample Date	Jan-06	Mar-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Jan-10	May-10
										Zone 1								
Benzene			1.7	2.8	2.5	2.7	2.7	2.9	2.9	3.1	2.7	4.4	3.4	3.8	4.3	4.3	4.6	2.1
Naphthalene				15	16	16	28	29	35	25	31	28	35	24	36	30	30	31
2,4-Dimethylphenol							160 D			180	170		210		170	190		
										Zone 2								
								No Exceedances									NS	NS
										Zone 3								
								No Exceedances									NS	NS
										Zone 4								
								No Exceedances									NS	NS

Constituent	FW-20B																
Sample Date	Mar-06	Jul-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Jan-10	May-10
									Zone 1								
2-Methylnaphthalene		62	49	35	30								29	42	60	53	110
Acenaphthene	54	63	65	59	58	60	39	58	30	42	44	42	53	74	60	47	63
Benzene	2.4	5.3	5.9	4.5	3.7	3.6	3.7	2.5	2.6	1.9	3	3.5	2.9	3.6	3.3	7.3	5.2
Carbazole	26	22	25	17	14	9	3.4 J									6.2	14
Dibenzofuran		33	37	35	34	35		33						36	29	29	35
Naphthalene		650	720	510	550	450	380	210	450	260	310	420	730	1000	870	690	1100
									Zone 2								
Acenaphthene		31	40	43	44	41	32	50		42	34	31	38	42	40	33	39
Benzene		3.1	2.5	2.9	2.7	2.2	1.9	3.3									1.1
Carbazole	2.1 J	9.6	13	12	10	5.4 J	2.7 J										
Naphthalene	53	370	140	120	140	85	94	99	49	100	58	73	96	150	170	63	240
									Zone 3								
								No Exceedances								NS	NS
									Zone 4								
								No Exceedances								NS	NS

Constituent	FW-30B
Sample Date	May-10
	Zone 1
	No Exceedances
	Zone 2
	No Exceedances
	Zone 3
	No Exceedances
	Zone 4
	No Exceedances

Constituent	FW-25C						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
	No Exceedances						

Constituent	FW-25B						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
	No Exceedances						

Constituent	FW-23B																
Sample Date	May-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	May-10
	Zone 1															
	No Exceedances															
	Zone 2															
	No Exceedances															
	Zone 3															
	No Exceedances															
	Zone 4															
Phenol									20							

Constituent	FW-26C						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
	No Exceedances						

Constituent	FW-26B						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
	No Exceedances						

Constituent	FW-23C																
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Mar-10						
	Zone 1																
	No Exceedances																
	Zone 2																
	No Exceedances																
	Zone 3																
NS	NS	No Exceedances															

Constituent	FW-4			
Sample Date	Dec-08	May-09	Nov-09	Feb-10
	No Exceedances			

Constituent	FW-4C										
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Feb-10
	Zone 1										
	No Exceedances										
	Zone 2										
Phenol	18										
	Zone 3										
	No Exceedances										

Constituent	FW-20D																
Sample Date	Mar-06	Jul-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Jan-10	May-10
									Zone 1								
2-Methylnaphthalene		62	49	35	30								29	42	60	53	110
Acenaphthene	54	63	65	59	58	60	39	58	30	42	44	42	53	74	60	47	63
Benzene	2.4	5.3	5.9	4.5	3.7	3.6	3.7	2.5	2.6	1.9	3	3.5	2.9	3.6	3.3	7.3	5.2
Carbazole	26	22	25	17	14	9	3.4 J									6.2	14
Dibenzofuran		33	37	35	34	35		33						36	29	29	35
Naphthalene		650	720	510	550	450	380	210	450	260	310	420	730	1000	870	690	1100
									Zone 2								
Acenaphthene		31	40	43	44	41	32	50		42	34	31	38	42	40	33	39
Benzene		3.1	2.5	2.9	2.7	2.2	1.9	3.3									1.1
Carbazole	2.1 J	9.6	13	12	10	5.4 J	2.7 J										
Naphthalene	53	370	140	120	140	85	94	99	49	100	58	73	96	150	170	63	240
									Zone 3								
								No Exceedances								NS	NS
									Zone 4								
								No Exceedances								NS	NS

NS NOT SAMPLED

LEGEND

- FW-25C — FLORIDAN SENTINEL MONITORING WELL
- FW-20B — FLORIDAN WESTBAY MONITORING WELL
- FW-6 — FLORIDAN STANDARD CONSTRUCTION MONITORING WELL
- SUBJECT SITE PROPERTY LINE (APPROXIMATE)
- FORMER CABOT CARBON SITE BOUNDARY

STANDARDS

Constituent	Federal MCL¹ (ug/L)	Florida GCTL² (ug/L)
Organic Chemicals		
2,4-Dimethylphenol	-	140
2-Methylnaphthalene	-	28
2-Methylphenol	-	35
3&4-Methylphenol	-	3.5³
Acenaphthene	-	20
Acenaphthylene	-	210
Anthracene	-	2100
Benzene	5	1
Carbazole	-	1.8
Dibenzofuran	-	28
Ethylbenzene	700	30
Fluoranthene	-	280
Fluorene	-	280
Naphthalene	-	14
Pentachlorophenol	1	1
Phenanthrene	-	210
Phenol	-	10
Pyrene	-	210
Toluene	10000	40
Xylene (total)	1000	20

0 200 400 FEET

BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

J: The quantity is an estimated value.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

NS = NOT SAMPLED

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)
(3) 3-METHYLPHENOL AND 4-METHYLPHENOL CANNOT BE QUANTIFIED SEPERATELY USING USEPA SW-846 METHOD 8270C.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	08/24/10
CHKD:	KC	DATE:	08/24/10
APPD:	AMG	DATE:	08/24/10
SCALE:	AS SHOWN		
ISSUE DATE:			

FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

SUMMARY OF FLORIDAN WELLS ORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 15

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Constituent	FW-24B										
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Jun-10
	Zone 1										
Arsenic, (dissolved)	140	78	86	99	107	101	122	105	134	120	165
Arsenic, (total)											156
	Zone 2										
Arsenic, (dissolved)	48	18	58	61	60	75	90	86	92	94	45
Arsenic, (total)											42
	Zone 3										
Arsenic, (dissolved)	13										
	Zone 4										
Arsenic, (dissolved)	No Exceedances										

Constituent	FW-28B
Sample Date	Jun-10
	Zone 1
	No Exceedances
	Zone 2
	No Exceedances
	Zone 3
	No Exceedances
	Zone 4
	No Exceedances

Constituent	FW-27B
Sample Date	Jun-10
	Zone 1
	No Exceedances
	Zone 2
	No Exceedances
	Zone 3
	No Exceedances
	Zone 4
	No Exceedances
	Zone 5
	No Exceedances
	Zone 6
	No Exceedances

Constituent	FW-29C
Sample Date	May-10
No Exceedances	

Constituent	FW-29B
Sample Date	May-10
Arsenic, dissolved	16
Arsenic, total	15

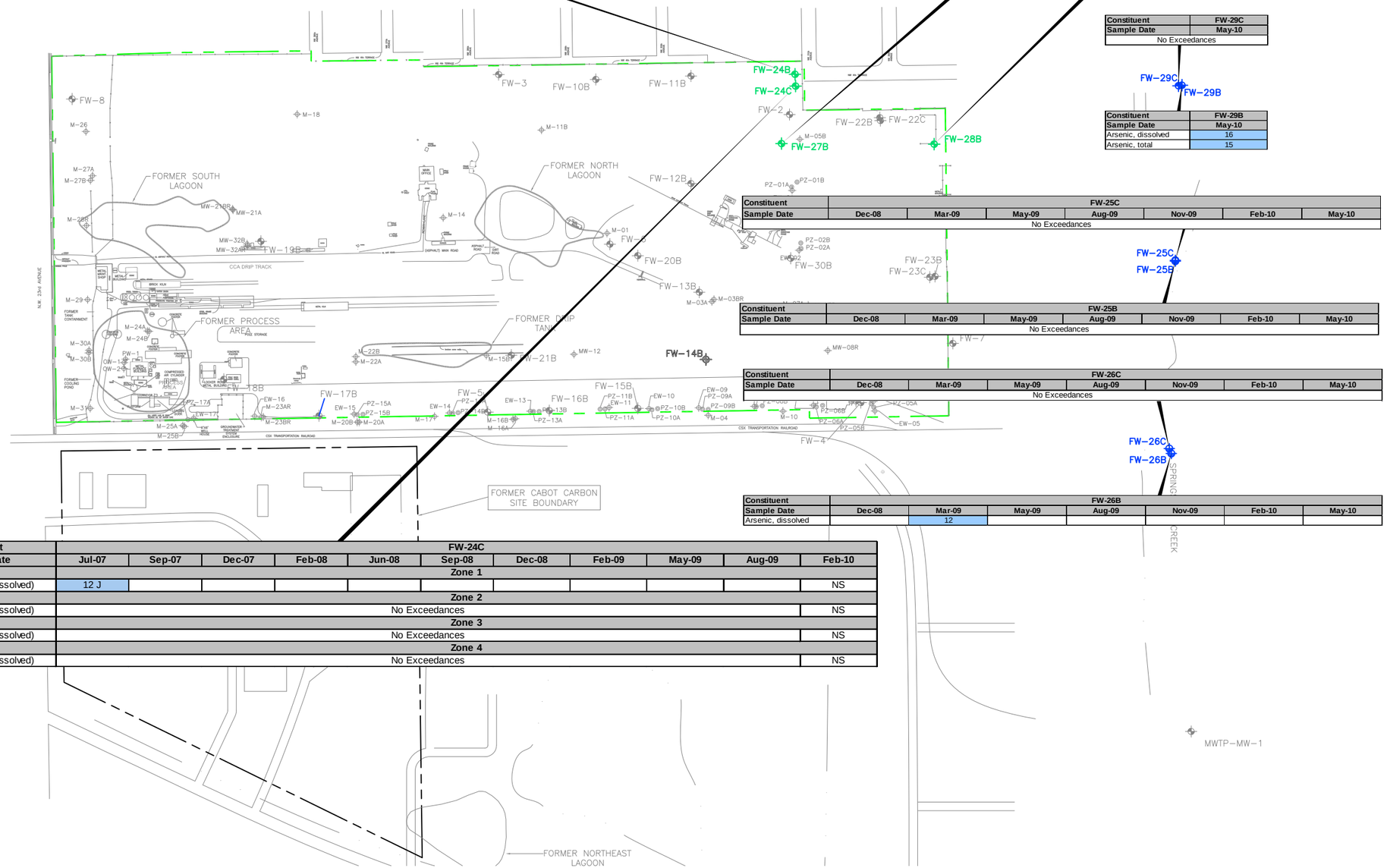
Constituent	FW-25C						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
No Exceedances							

Constituent	FW-25B						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
No Exceedances							

Constituent	FW-26C						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
No Exceedances							

Constituent	FW-26B						
Sample Date	Dec-08	Mar-09	May-09	Aug-09	Nov-09	Feb-10	May-10
Arsenic, dissolved		12					

Constituent	FW-24C										
Sample Date	Jul-07	Sep-07	Dec-07	Feb-08	Jun-08	Sep-08	Dec-08	Feb-09	May-09	Aug-09	Feb-10
	Zone 1										
Arsenic, (dissolved)	12 J										NS
	Zone 2										
Arsenic, (dissolved)	No Exceedances										NS
	Zone 3										
Arsenic, (dissolved)	No Exceedances										NS
	Zone 4										
Arsenic, (dissolved)	No Exceedances										NS



NOTE: BLANK SPACES INDICATE THIS CONSTITUENT DOES NOT EXCEED STANDARDS

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE: GEOTRANS 2010 FIGURES COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLING PLAN; AUGUST 4, 2010.

Concentration exceeds Florida GCTL.
Concentration exceeds Federal MCL.
All results are in the units ug/L.

(1) FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS) REPRESENT THE NATIONAL PRIMARTY DRINKING WATER STANDARDS.
(2) FLORIDA GROUNDWATER CLEANUP TARGET LEVELS (GCTLS) ARE GUIDELINES SET FORTH IN 62-777 FLORIDA ADMINISTRATIVE CODE (F.A.C)

N

LEGEND

- FW-22B — FLORIDAN WESTBAY MONITORING WELL
- FW-25C — FLORIDAN SENTINEL MONITORING WELL
- SUBJECT SITE PROPERTY LINE (APPROXIMATE)
- FORMER CABOT CARBON SITE BOUNDARY

STANDARDS

Constituent	Federal MCL(1) (ug/L)	Florida GCTL(2) (ug/L)
Metals		
Arsenic, dissolved	10	10
Arsenic, total	10	10

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	KC	DATE:	08/18/10
CHKD:	KC	DATE:	08/18/10
APPD:	AMG	DATE:	08/18/10
SCALE:	AS SHOWN		
ISSUE DATE:			

FTS
FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2010 FIRST SEMIANNUAL
COMPREHENSIVE GROUNDWATER MONITORING REPORT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

SUMMARY OF FLORIDAN WELLS INORGANIC ANALYTICAL EXCEEDANCES

PROJECT NO: 0M045010
DRAWING NUMBER
FIGURE 16

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APPENDIX A

FIELD FORMS

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: FW-4

PERMIT NO.:

roject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Sunny 65° Wind from the West Sampling Date: 2/2/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 129.51 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 159.70 (ft)

e. LNAPL Thickness: (a-b) NP (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 30.19 (ft) (a-d)

h. Well Volume: 4.92 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: S.S. Bladder Pump w/ teflon bladder (11484)

b. Field Testing Equipment: YSI 556 (06M1536AM) Lic Mott 2020e (10326

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.19 (5vol)

e. Begin Purge Time: 1538 End Purge Time: 1608

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
Int	1538	150ml	20.29	7.80	0.325	-39.0	3.21	17.89			129.59
PURGING VALUES											
1	1543	150ml	20.65	7.65	0.366	-47.1	0.48	5.91			129.60
2	1548	150ml	20.67	7.63	0.368	-49.2	0.41	2.24			129.61
3	1553	150ml	20.69	7.57	0.369	-58.1	0.30	1.09			129.61
4	1558	150ml	20.70	7.56	0.370	-61.3	0.29	.91			129.59
5	1603	150ml	20.70	7.56	0.371	-64.9	0.28	.98			129.59
6	1608	150ml	20.71	7.55	0.371	-68.3	0.28	.90			129.59

3. SAMPLE COLLECTION DATA Sampling Personnel: G. Bozek

Sampling Method(s) & Equip: S.S. Bladder Pump w/ teflon bladder

Sample I.D. (Name, Date, Time): FW-4-020210 2/2/10 1610

Sample Analytical Parameters/Method: 8260B/8270C

aple Start Time: 1610 End SampleTime: 1650

COMMENTS: WL 20349

Equipment Blank collected EB-02-020210 2/2/10 1730

WELL NO.: FW-25B

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.:	OM045010-091	**Date:**	2/2/10	**Time: Start:**	1320 am/pm
Project Name:	Gainesville 1st Qtr/SA GW Event 2010	SENTINEL		**Finish:**	1512 am/pm
Location:	Gainesville, FL				
Weather Conditions:	Cloudy 60's	**Collector:**	JEFF LEAVER (Print / Sign)		

1. WATER LEVEL DATA (measured from top of well casing)

a. **Total Casing Length:** 230.00 (ft) b. **Well Casing Type:** SS

c. **Depth to Water:** 108.82 (ft) d. **Casing Diameter:** 4 (in)

e. **Length of Water Column:** 121.18 (ft) (a-c)

f. **Well Volume:** 79.1 (gal)

Conversion Factors (cf) (e x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
(4)	0.653
6	1.470

2. WELL PURGE DATA

a. **Purge Method:** GRUNDFOS PUMP

b. **Field Testing Equipment:** YSI 63 . HACH 2100P

c. **Number of Well Volumes to Remove:** 3

d. **Required Total Purge Volume (1f x 2c):** 237.4

Vol. Purged (total gal)	Temp (constant° C)	pH (±.2 s.u.)	Spec. Cond. mS/cm (±3%)	Turbidity (<10NTU or stable)	Notes
INITIAL	22.86	7.64	.426	2.7	CLEAR
80	23.16	7.67	.423	2.1	↓
160	23.26	7.79	.415	1.4	↓
240	23.32	7.81	.414	1.7	↓
		JJ	2/2/10		

3. SAMPLE COLLECTION INFORMATION

Sampling Method(s): DEDICATED TEFLON LINED TUBING

Sample Identification (name, time, date): FW-25B-020210 , 1500 , 2/2/10

QC Samples (name, time, date): MS/MSD

Analytical Parameters and Methods:	BTEX 8260B	SVOC's 8270C	TAL ARSENIC 6020

Comments: SULFER ODOR

WELL NO.: FW-25 C

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.: OM045010-091 Date: 2/2/10 Time: Start: 1524 am/pm
Project Name: Gainesville 1st Qtr/SA GW Event 2010 SENTINEL Finish: 1745 am/pm
Location: Gainesville, FL
Weather Conditions: P. SUNNY 60'S Collector: JEFF LEAVER (Print) (Sign)

1. WATER LEVEL DATA (measured from top of well casing)

a. Total Casing Length: 380.00 (ft) b. Well Casing Type: SS
c. Depth to Water: 109.40 (ft) d. Casing Diameter: 4 (in)
e. Length of Water Column: 270.60 (ft) (a-c)
f. Well Volume: 176.70 (gal)

Conversion Factors (cf)
(e x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
(4)	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: GRUNDFOS PUMP
b. Field Testing Equipment: YSI 63, HACH 2100P
c. Number of Well Volumes to Remove: 3
d. Required Total Purge Volume (1f x 2c): 530.0

Vol. Purged (total gal)	Temp (constant° C)	pH (±.2 s.u.)	Spec. Cond. mS/cm (±3%)	Turbidity (<10NTU or stable)	Notes
INITIAL	22.70	7.84	.355	2.9	CLEAR
180	22.60	7.91	.366	2.4	
360	22.58	7.94	.366	1.7	
530	22.60	7.95	.367	1.1	
		J.F.	2/2/10		

3. SAMPLE COLLECTION INFORMATION

Sampling Method(s): DEDICATED TEFLON LINED TUBING
Sample Identification (name, time, date): FW-25C-020210, 1730, 2/2/10
QC Samples (name, time, date): NONE

Analytical Parameters and Methods:			
	BTEX	SVOC's	T+D ARSENIC
	8260B	8270C	6020

Comments: SULFUR ODOR

WELL NO.: FW-26 C

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.: OM045010-091 Date: 2/3/10 Time: Start: 1010 am/pm
Project Name: Gainesville 1st Qtr/SA GW Event 2010 SENTINEL Finish: 1400 am/pm
Location: Gainesville, FL
Weather Conditions: SUNNY 58° Collector: JEFF CRAVER (Print) (Sign)

1. WATER LEVEL DATA (measured from top of well casing)

a. Total Casing Length: 380.00 (ft) b. Well Casing Type: SS
c. Depth to Water: 119.11 (ft) d. Casing Diameter: 4 (in)
e. Length of Water Column: 260.89 (ft) (a-c)
f. Well Volume: 170.4 (gal)

Conversion Factors (cf)
(e x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
(4)	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: GRUNDFOS PUMP
b. Field Testing Equipment: YSI 63, HACH 2100P
c. Number of Well Volumes to Remove: 3
d. Required Total Purge Volume (1f x 2c): 511.0

Vol. Purged (total gal)	Temp (constant° C)	pH (±2 s.u.)	Spec. Cond. mS/cm (±3%)	Turbidity (<10NTU or stable)	Notes
INITIAL	22.80	10.30	.211	3.6	CLEAR
180	23.68	7.90	.433	2.2	
340	22.61	7.77	.425	1.7	
440	22.70	7.80	.421	1.5	
520	22.73	7.82	.420	0.9	

3. SAMPLE COLLECTION INFORMATION

Sampling Method(s): DEDICATED TEFLON LINED TUBING
Sample Identification (name, time, date): FW-26C-020310, 1330, 2/3/10
QC Samples (name, time, date): DUPLICATE (FW-99C-020310 @ 2000)
TOOK FIELD BLANK @1320
Analytical Parameters and Methods: BTEX / 8260B | SVOC's / 8270C | T+D AS. / 6020
Comments: SULFUR ODOR

WELL NO.: FW-26B

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.: OM045010-091 Date: 2/3/10 Time: Start: 0740 am/pm
Project Name: Gainesville 1st Qtr/SA GW Event 2010 SENTINEL Finish: 0950 am/pm
Location: Gainesville, FL
Weather Conditions: SUNNY 52° Collector: JEFF LEAVER (Print) (Sign)

1. WATER LEVEL DATA (measured from top of well casing)

a. Total Casing Length: 230.00 (ft) b. Well Casing Type: SS
c. Depth to Water: 111.21 (ft) d. Casing Diameter: 4 (in)
e. Length of Water Column: 118.79 (ft) (a-c)
f. Well Volume: 77.6 (gal)

Conversion Factors (cf) (e x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
(4)	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: GRUNDFOS PUMP
b. Field Testing Equipment: YSI 63, HACH 2100P
c. Number of Well Volumes to Remove: 3
d. Required Total Purge Volume (1f x 2c): 233.0

Vol. Purged (total gal)	Temp (constant° C)	pH (±.2 s.u.)	Spec. Cond. (±3%)	Turbidity (<10NTU or stable)	Notes
INITIAL	20.51	8.73	.408	1.7	CLEAR
80	22.48	8.34	.416	2.0	
160	22.50	8.02	.420	1.4	
200	22.52	7.97	.422	0.7	
240	22.53	7.94	.425	0.4	

3. SAMPLE COLLECTION INFORMATION

Sampling Method(s): DEDICATED TEFLON LINED TUBING
Sample Identification (name, time, date): FW-26B-020310, 0930, 2/3/10
QC Samples (name, time, date): NONE

Analytical Parameters and Methods:	BTEX	SVOC's	T+D ARSENIC
	8260B	8270C	6020

Comments: SULFER ODOR

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-20d

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: SUNNY 64° Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: N/A (ft) b Depth to Water: 37.82 (ft)

c. Depth to DNAPL: N/A (ft) d Total Well Depth: 83.96 (ft)

e. LNAPL Thickness: (a-b) N/A (ft) f. DNAPL Thickness: (c-d) N/A (ft)

g. Length of Water Column: 46.14 (ft) (a-d)

h. Well Volume: 7.5 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: LOW FLOW

b. Field Testing Equipment: YSI 556, LAMOTTE 2020

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.19 (gal)

e. Begin Purge Time: 1500 End Purge Time: 1545

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
INT	4	200	20.14	7.36	.393	-59.0	3.94	4.4	—	—	37.67
PURGING VALUES											
1	10	200	20.44	7.42	.362	-78.4	2.37	1.8	—	—	37.74
2	15	200	20.65	7.42	.354	-95.6	1.76	1.1	—	—	37.76
3	20	|	20.74	7.40	.351	-106.2	1.48	1.0	—	—	37.72
4	25	|	20.72	7.38	.350	-106.8	1.30	0.7	—	—	37.74
5	30	|	20.71	7.38	.350	-107.7	1.22	0.4	—	—	37.77
6	35	|	20.71	7.38	.349	-108.3	1.17	0.9	—	—	37.75
7	40	|	20.71	7.37	.349	-109.1	1.14	0.4	—	—	37.75
8	45	↓	20.70	7.37	.350	-109.7	1.13	0.4	—	—	37.77

2/3/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JEFF WEAVER

Sampling Method(s) & Equip: BLADDER PUMP & DEDICATED TEFLON LINED TUBING

Sample I.D. (Name, Date, Time): HG-20d-020310 , 2/3/10 , 1550

Sample Analytical Parameters/Method: BTEX/8260B , SVOC's/8270C

Sample Start Time: 1550 End SampleTime: 1615

COMMENTS:

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: MG-205

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: slight wind, 2 50°F sunny Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 6.62 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 39.56 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 32.94 (ft) (a-d)

h. Well Volume: 5.37 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Low flow Peristaltic (001101)

b. Field Testing Equipment: YSI 556 (OM01955A2) / Lamotte (10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.08 (gal)

e. Begin Purge Time: 1105 End Purge Time:

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
I	1105	120	18.19	5.64	0.123	-10.6	6.09	1.98			7.03
PURGING VALUES											
1	1110	100	18.24	6.40	0.491	-26.6	0.49	1.55			7.79
2	1115	100	18.30	6.51	0.502	-29.9	0.39	1.46			7.90
3	1120	100	18.34	6.57	0.486	-34.6	0.32	1.31			8.00
4	1125	100	18.40	6.46	0.440	-37.1	0.28	1.14			8.08
5	1130	100	18.44	6.38	0.390	-44.4	0.27	1.61			8.16
6	1135	100	18.46	6.36	0.371	-45.1	0.20	1.40			8.21
7	1140	100	18.47	6.34	0.366	-45.7	0.23	1.31			8.27
8	1145	100	18.49	6.33	0.364	-46.1	0.22	1.27			8.33

3. SAMPLE COLLECTION DATA Sampling Personnel: RH, JB

Sampling Method(s) & Equip: Peristaltic pump w/ teflon-lined tubing

Sample I.D. (Name, Date, Time): MG-205-020310, 2/3/10, 1145

Sample Analytical Parameters/Method: BTEX (8260B), SVOC's (8270C)

Sample Start Time: 1145 End SampleTime: 1209

COMMENTS:

(WL 20325) Purged at lowest possible rate.

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-21d

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: sunny 54° Sampling Date: 2/4/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: N/A (ft) b Depth to Water: 36.55 (ft)

c. Depth to DNAPL: N/A (ft) d Total Well Depth: 94.60 (ft)

e. LNAPL Thickness: (a-b) N/A (ft) f. DNAPL Thickness: (c-d) N/A (ft)

g. Length of Water Column: 58.05 (ft) (a-d)

h. Well Volume: 9.5 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Low Flow

b. Field Testing Equipment: YSI 556, LaMotte 2020e

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 9,000 mL

e. Begin Purge Time: 0945 End Purge Time: 1030

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
INT.	3	200	18.76	7.46	.284	-41.1	6.11	7.4	—	—	36.52
PURGING VALUES											
1	10	200	19.54	7.39	.297	-62.4	3.01	6.7	—	—	36.50
2	15		19.91	7.37	.301	-80.6	1.77	4.9	—	—	36.54
3	20		20.55	7.37	.307	-87.1	0.94	4.4	—	—	36.55
4	25		20.61	7.37	.308	-87.5	0.86	2.7	—	—	36.55
5	30		20.67	7.36	.309	-87.7	0.78	2.5	—	—	36.55
6	35		20.78	7.36	.311	-90.9	0.70	2.8	—	—	36.56
7	40		20.80	7.36	.311	-91.7	0.68	3.0	—	—	36.54
8	45	↓	20.82	7.35	.312	-92.2	0.67	2.4	—	—	36.54

2/4/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JEFF LEAVER

Sampling Method(s) & Equip: BLADDER PUMP & DEDICATED TEFLON LINED TUBING

Sample I.D. (Name, Date, Time): HG-21d-020410 , 2/4/10 , 1030

Sample Analytical Parameters/Method: BTEX/8260B , SVOC's/8270C

Sample Start Time: 1030 End SampleTime: 1045

COMMENTS:

TOOK EB-04-020410 @0930 , TOOK FB-04-020410 @ 1020

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-215

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Sunny, N breeze 5-10 mph, 45° Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 9.55 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 40.92 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 31.37 (ft) (a-d)

h. Well Volume: 5.11 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic pump (SN 001101)

b. Field Testing Equipment: YSI (05M1955A1) LaMotte (10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.06 (gal)

e. Begin Purge Time: 0840 End Purge Time: 0920

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
I	0840	125	15.55	6.67	0.261	-5.7	4.91	2.56			10.35
PURGING VALUES											
1	0845	110	15.65	6.84	0.260	-17.3	3.53	1.80			10.62
2	0850	95	16.27	7.27	0.263	-72.4	1.07	1.71			11.22
3	0855	95	16.22	7.32	0.263	-84.3	0.80	1.66			11.36
4	0900	95	16.24	7.38	0.260	-88.1	0.63	1.69			11.55
5	0905	95	16.31	7.38	0.259	-91.3	0.48	1.55			11.67
6	0910	95	16.40	7.42	0.258	-93.1	0.48	1.65			11.78
7	0915	95	16.41	7.46	0.257	-94.2	0.46	1.48			11.89
8	0920	95	16.42	7.48	0.257	-94.7	0.49	1.42			11.99

JB 2/3/10

3. SAMPLE COLLECTION DATA

Sampling Personnel: RH, JB

Sampling Method(s) & Equip: Peristaltic Pump w/ Dedicated Teflon Lined Tubing

Sample I.D. (Name, Date, Time): HG215-020310, 2/3/10, 0920

Sample Analytical Parameters/Method: BTEX (SW846 8260B), SVOCs (SW846 8270C)

Sample Start Time: 0920 End SampleTime: 0945

COMMENTS:

WL #26325 (Rental) Well drawing down but recharging slowly (> calculated volume removed) Pumping at lowest sustainable rate

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG 22D

PERMIT NO.:

roject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Sunny 70° winds calm Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 43.21 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 82.36 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) N/A (ft)

g. Length of Water Column: 39.15 (ft) (a-d)

h. Well Volume: 6.38 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Bladder Pump w/Teflon bladder (11484)

b. Field Testing Equipment: YSI 556 (06M1556AM) LaMotte 2020e (10326)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: .876 gal

e. Begin Purge Time: 1510 End Purge Time: 1550

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
Init.	1510	100 mL	19.76	8.09	0.239	-150.4	1.85	1.98			43.72
PURGING VALUES											
1	1515	80 mL	19.61	8.09	0.239	-162.2	0.45	2.64			43.77
2	1520	80 mL	18.78	8.08	0.241	-165.2	0.47	2.48			43.81
3	1525	80 mL	18.80	8.07	0.240	-166.3	0.46	2.11			43.83
4	1530	80 mL	18.70	8.07	0.238	-166.0	0.46	3.01			43.85
5	1535	80 mL	18.62	8.07	0.238	-165.2	0.26	2.78			43.88
6	1540	80 mL	18.64	8.06	0.236	-169.2	0.24	2.19			43.89
7	1545	80 mL	18.66	8.07	0.235	-168.9	0.24	2.32			43.91
8	1550	80 mL	18.66	8.07	0.235	-168.9	0.24	2.22			43.93

2/3/10

3. SAMPLE COLLECTION DATA Sampling Personnel: G. Bozek

Sampling Method(s) & Equip: S.S. Bladder Pump w/Teflon Bladder

Sample I.D. (Name, Date, Time): HG 22D-20310 1553 2/3/10

Sample Analytical Parameters/Method: 8260B / 8270C

ple Start Time: 1553 End SampleTime: 1620

COMMENTS:

WL SN# 20334

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG 23D

PERMIT NO.:

roject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Sunny 55° Winds out of East Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 52.24 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 89.25 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 37.01 (ft) (a-d)

h. Well Volume: 6.03 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
②	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: S.S. Bladder Pump w/ teflon bladder (11484)

b. Field Testing Equipment: YSI 556 (06M1536AM) LaMotte 2020e (10326)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.53 gal

e. Begin Purge Time: 1032 End Purge Time: 1057

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
Init.	1032	150ml	20.63	7.81	0.266	-73.5	0.65	17.20			52.39
PURGING VALUES											
1	1037	220ml	20.74	7.76	0.266	-79.0	0.51	3.06			52.40
2	1042	200ml	20.92	~~7.85~~ 7.79	0.266	-80.4	0.34	4.77			52.42
3	1047	200 ml	20.94	7.71	0.266	-82.3	0.36	4.65			52.42
4	1052	200ml	20.95	7.71	0.267	-84.7	0.35	3.25			52.43
5	1057	200ml	20.95	7.70	0.267	-85.6	0.34	2.01			52.44

3. SAMPLE COLLECTION DATA Sampling Personnel: G. Bzorek

Sampling Method(s) & Equip: S.S. Bladder Pump w/teflon bladder

Sample I.D. (Name, Date, Time): HG-23D-020310 2/3/10 1100

Sample Analytical Parameters/Method: 8260B / 8270C

ıple Start Time: 1100 End SampleTime: 1113

COMMENTS:

WL SN# 20344 EB collected EB-020310 2/3/10 1200

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-245

PERMIT NO.:

roject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Overcast 60° Sampling Date: 2/2/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 14.40 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 71.55 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 57.15 (ft) (a-d)

h. Well Volume: 9.32 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic pump (001101)

b. Field Testing Equipment: YSI 556 (05M1955A1) LaMotte (ME10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 2.25 (9gal)

e. Begin Purge Time: 1035 End Purge Time: 1105

Read No.	Lapse Time (min.)	mL/min Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
I	1035	350	17.91	6.88	0.207	-18.2	7.10	4.11			14.49
PURGING VALUES											
1	1040	300	18.62	7.34	0.210	-36.1	1.73	2.48			14.51
2	1045	300	18.80	7.40	0.211	-37.3	0.86	2.60			14.53
3	1050	250	18.86	7.39	0.211	-37.1	0.80	2.70			14.53
4	1055	250	18.85	7.34	0.213	-35.2	0.79	2.62			14.54
5	1100	250	18.85	7.33	0.214	-34.6	0.74	2.66			14.54
6	1105	250	18.88	7.33	0.216	-34.8	0.72	2.59			14.54

2/2/10

3. SAMPLE COLLECTION DATA Sampling Personnel: RH, JB

Sampling Method(s) & Equip: Peristaltic pump w/ dedicated teflon-lined tubing

Sample I.D. (Name, Date, Time): HG-245-020210, 2/2/10, 1110

Sample Analytical Parameters/Method: SVOC's (SW846 8270C) VOC's (SW846 8260B)

ple Start Time: 1110 End SampleTime: 1201

COMMENTS: Collected duplicate M-99B-020210:2000

W.L. (20323)

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG 25D

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: 65° Sunny wind: s/m Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 51.21 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 85.71 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 34.50 (ft) (a-d)

h. Well Volume: 5.62 (gal)

2. WELL PURGE DATA

a. Purge Method: S.S. Bladder Pump w/Teflon bladder (11484)

b. Field Testing Equipment: YSI 556 (06M1536AM) LaMotte 2020e (10526)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: .79 (gal)

e. Begin Purge Time: 1343 End Purge Time: 1413

Conversion Factors (a x cf = b)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
Init.	1343	100mL	23.20	7.76	0.261	-161.9	0.54	3.44			51.71
PURGING VALUES											
1	1348	100mL	23.11	7.72	0.261	-158.2	0.36	3.17			51.74
2	1353	100mL	23.15	7.71	0.261	-168.3	0.33	3.35			51.77
3	1358	100mL	23.09	7.71	0.260	-167.1	0.28	3.14			51.75
4	1403	100mL	23.10	7.69	0.260	-171.4	0.27	3.09			51.79
5	1408	100mL	23.09	7.69	0.260	-178.3	0.26	2.89			51.82
6	1413	100mL	23.09	7.67	0.259	-179.6	0.25	2.98			51.84

2/3/10

3. SAMPLE COLLECTION DATA Sampling Personnel: G. Bzorek

Sampling Method(s) & Equip: S.S. Bladder w/Teflon bladder

Sample I.D. (Name, Date, Time): HG-25D-020310 2/3/10 1415

Sample Analytical Parameters/Method: B260B/8270C

Sample Start Time: 1415 End SampleTime: 1445

COMMENTS:

WL SN# 20354

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: MG-26d

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: SUNNY 47° Sampling Date: 2/4/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: N/A (ft) b Depth to Water: 40.11 (ft)

c. Depth to DNAPL: N/A (ft) d Total Well Depth: 93.80 (ft)

e. LNAPL Thickness: (a-b) N/A (ft) f. DNAPL Thickness: (c-d) N/A (ft)

g. Length of Water Column: 53.69 (ft) (a-d)

h. Well Volume: 8.8 (gal)

2. WELL PURGE DATA

a. Purge Method: LOW FLOW

b. Field Testing Equipment: YSI 556, LAMOTTE 2020e

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 9,000 ML

e. Begin Purge Time: 0800 End Purge Time: 0845

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
INT.	4	200	14.25	7.60	.285	-21.1	6.48	7.7	—	—	40.07
PURGING VALUES											
1	10	200	17.95	7.53	.263	-60.5	4.39	4.9	—	—	40.11
2	16		18.73	7.49	.260	-66.4	4.01	4.3	—	—	40.11
3	22		19.26	7.48	.257	-71.7	2.94	2.7	—	—	40.11
4	20		19.52	7.47	.255	-79.2	2.20	2.9	—	—	40.12
5	35		19.99	7.47	.255	-80.8	1.89	1.4	—	—	40.10
6	40		20.27	7.46	.255	-81.4	1.84	1.0	—	—	40.11
7	45	↓	20.29	7.46	.254	-81.9	1.82	1.2	—	—	40.13

J.L. 2/4/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JEFF WEAVER

Sampling Method(s) & Equip: BLADDER PUMP & DEDICATED TEFLON LINED TUBING

Sample I.D. (Name, Date, Time): MG-26d-020410 , 2/4/10 , 0848

Sample Analytical Parameters/Method: BTEX/8260B , SVOC's/8270C

Sample Start Time: 0848 End SampleTime: 0910

COMMENTS:

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-265

PERMIT NO.:

roject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Sunny, N wind 10mph Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 12.22 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 44.12 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 31.90 (ft) (a-d)

h. Well Volume: 5.20 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic pump (0101101)

b. Field Testing Equipment: YSI (10M01955 41) LaMotte (10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.06 Gal

e. Begin Purge Time: 1545 End Purge Time: 1610

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
T	1545	200	20.92	5.78	0.463	-47.1	3.98	1.21			12.89
PURGING VALUES											
1	1550	100	20.59	5.75	0.462	-52.3	0.79	0.94			12.95
2	1555	100	20.62	5.73	0.460	-60.1	0.50	0.83			12.96
3	1600	100	20.59	5.80	0.462	-66.2	0.42	0.66			12.98
4	1605	100	20.61	5.84	0.498	-70.4	0.37	0.57			13.00
5	1610	100	20.63	5.86	0.500	-70.9	0.35	0.49			13.01
6	1615	100	20.66	5.88	0.503	-71.2	0.32	0.55			13.03
7	1620	100	20.67	5.89	0.505	-71.6	0.31	0.44			13.05

3. SAMPLE COLLECTION DATA Sampling Personnel: RH, JB

Sampling Method(s) & Equip: Peristaltic pump w/teflon-lined tubing

Sample I.D. (Name, Date, Time): HG-265-020310 2/3/10 1620

Sample Analytical Parameters/Method: BTEX (8260B), TOC's (9060C)

Sample Start Time: 1620 End SampleTime: 1643

COMMENTS:

WL (20325) FB03-020710: 1700

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG 27D

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Sunny 50° winds out of E NE Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 32.56 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 96.22 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 63.66 (ft) (a-d)

h. Well Volume: 10.37 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: S.S. Bladder Pump w/Teflon bladder (11484)

b. Field Testing Equipment: YSI (06M1536AM) LaMotte 2020e (10326)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.12 gal.

e. Begin Purge Time: 0850 End Purge Time: 0925

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
Init.	0850	100mL	16.23	8.31	0.258	-78.1	1.98	12.1			32.69
PURGING VALUES											
1	0855	100mL	17.39	8.30	0.241	-182.1	0.84	8.77			32.67
2	0900	150mL	18.04	8.22	0.237	-192.6	0.45	7.95			32.68
3	0905	150mL	18.60	8.10	0.237	-198.2	0.34	6.68			32.69
4	~~0910~~ 0915	150mL	18.62	8.04	0.238	-200.1	0.35	5.52			32.69
5	0915	150mL	18.89	7.93	0.245	-196.2	0.33	5.93			32.68
6	0920	150mL	18.90	7.89	0.249	-190.1	0.34	5.74			32.68
7	0925	150mL	18.91	7.89	0.247	-189.9	0.34	5.56			32.69

2/3/10

3. SAMPLE COLLECTION DATA Sampling Personnel: G. Bzorek

Sampling Method(s) & Equip: S.S. Bladder Pump w/Teflon bladder

Sample I.D. (Name, Date, Time): HG27D-020310 2/3/10 0928

Sample Analytical Parameters/Method: 8260B / 8270C

Sample Start Time: 0928 End SampleTime: 0946

COMMENTS:

WL SN# 20344

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: MG-27S

PERMIT NO.:

roject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: partly cloudy, ~ 50°F Sampling Date: 2/2/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 7.77 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 59.66 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 51.89 (ft) (a-d)

h. Well Volume: 8.46 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic pump (001101)

b. Field Testing Equipment: YSI 556 (05M1955A1) LaMotte (ME10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: .99 (gal)

e. Begin Purge Time: 1335 End Purge Time: 1415

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
Init	1335	150	18.84	8.81	0.234	-91.5	3.79	3.74			8.90
PURGING VALUES											
1	1340	100	19.46	9.11	0.230	-102.7	2.15	3.60			9.46
2	1345	100	19.88	9.22	0.227	-106.6	1.85	2.56			~~9.88~~ 9.55
3	1350	80	19.94	9.24	0.228	-106.9	1.62	3.23			~~10.49~~ 9.57
4	1355	80	19.91	9.25	0.229	-107.4	1.45	3.48			9.66
5	1400	80	19.98	9.09	0.226	-102.6	1.41	3.62			9.71
6	1405	80	20.02	9.06	0.226	-101.1	1.40	3.66			9.77
7	1410	80	20.01	9.02	0.226	-99.6	1.42	3.66			9.81
8	1415	80	20.04	9.00	0.226	-98.7	1.44	3.57			9.85

JB 2/2/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JB/RM

Sampling Method(s) & Equip: Peristaltic Pump w/ Dedicated Teflon Lined Tubing

Sample I.D. (Name, Date, Time): MG-27S-020210, 2/2/10, 1415

Sample Analytical Parameters/Method: SVOCs (8270C), BTEX (8260B)

mple Start Time: 1415 End SampleTime: 1445

COMMENTS: Slowest possible purge w/ significant drawdown. W.L. (20323)

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG 29D

PERMIT NO.:

roject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Partly cloudy 60° Winds ENE Sampling Date: 2/4/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 40.59 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 96.38 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 55.79 (ft) (a-d)

h. Well Volume: 9.09 (gal)

2. WELL PURGE DATA

a. Purge Method: Low Flow S.S. Bladder Pump w/ teflon bladder (11484)

b. Field Testing Equipment: YST 556 (06M1536AM) LaMotte 2020e (10326)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.84 (gal)

e. Begin Purge Time: 0910 End Purge Time: 0945

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
Int.	0910	190 ml	19.01	6.38	3.006	-32.1	3.91	14.1			41.33
PURGING VALUES											
1	0915	200 ml	18.44	6.37	3.028	-42.1	1.18	8.66			41.34
2	0920	200 ml	18.96	6.35	3.018	-45.5	0.33	3.96			41.33
3	0925	200 ml	19.62	6.33	3.038	-40.1	0.22	2.84			41.33
4	0930	200 ml	20.05	6.31	3.051	-54.1	0.19	2.67			41.33
5	0935	200 ml	20.60	6.29	3.059	-53.8	0.18	2.42			41.32
6	0940	200 ml	20.61	6.28	3.055	-57.1	0.18	2.11			41.33
7	0945	200 ml	20.61	6.27	3.054	-59.6	0.17	2.21			41.33

2/4/10

3. SAMPLE COLLECTION DATA Sampling Personnel: GBzorek

Sampling Method(s) & Equip: S.S. Bladder Pump w/ teflon bladder

Sample I.D. (Name, Date, Time): HG29D-020410 2/4/10 0948

Sample Analytical Parameters/Method: 8260B / 8270C

ample Start Time: 0948 End SampleTime: 1029

COMMENTS:

MS/MSD Collected HG 29D-MS/MSD-020410 2/4/10 0948

WL 20334

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG 295

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Partly cloudy 60° winds ENE Sampling Date: 2/4/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 12.18 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 54.28 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 42.10 (ft) (a-d)

h. Well Volume: 6.86 (gal)

Conversion Factors (a x cf = b)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Low Flow Bladder Pump w/ Teflon Bladder (11484)

b. Field Testing Equipment: YSI 556 (06M1536AM) LaMotte 2020wd (10526)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: .79 Gal

e. Begin Purge Time: 1020 End Purge Time: 1055

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
Ent.	1020	100mL	21.41	5.30	5.596	-54.4	0.23	41.01			12.35
PURGING VALUES											
1	1025	100 mL	21.54	5.30	5.679	-61.2	0.21	9.04			12.41
2	1030	100mL	21.59	5.31	5.701	-66.9	0.09	7.14			12.46
3	1035	100mL	21.58	5.29	5.744	-71.5	0.08	7.98			12.48
4	1040	100mL	22.08	5.26	5.768	-77.1	0.09	6.01			12.51
5	1045	100mL	22.09	5.25	5.769	-80.1	0.05	5.91			12.53
6	1050	100mL	22.09	5.25	5.771	-83.2	0.10	5.64			12.55

2/4/10

3. SAMPLE COLLECTION DATA Sampling Personnel: G. Bzorek

Sampling Method(s) & Equip: S.S. Bladder Pump w/Teflon bladder

Sample I.D. (Name, Date, Time): HG 295-020410 2/4/10 1055

Sample Analytical Parameters/Method: 8260B/8270C

Sample Start Time: 1035 End SampleTime: 1130

COMMENTS:

DUP Collected HG 99D-020410 2/4/10 2000

WL SWH 20334

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: ITW-22

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Rain, 50' Sampling Date: 2/2/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 10.18 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 16.55 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 6.37 (ft) (a-d)

h. Well Volume: 1.04 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic pump (SN001101)

b. Field Testing Equipment: YSI (SN 0M1955A1) LaMotte (SN ME10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: ~~30 gal~~ 2 1.97 (gal)

e. Begin Purge Time: 0858 End Purge Time: 0945

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
I	0858	250	16.29	7.04	0.295	-29.6	7.63	6.69			10.28
PURGING VALUES											
1	0903	250	16.44	6.98	0.294	-27.2	4.61	4.47			10.26
2	0908	250	16.92	6.52	0.293	-22.1	2.77	3.56			10.26
3	0913	250	16.99	6.48	9.88	-19.9	2.67	3.23			10.27
4	0918	250	17.43	6.47	0.241	-19.4	1.98	2.79			10.26
5	0923	250	17.82	6.46	0.231	-18.4	1.70	1.71			10.26
6	0928	250	17.88	6.40	0.217	-10.2	1.36	1.78			10.26
7	0933	250	17.90	6.38	0.215	-7.7	1.32	1.68			10.26
8	0938	250	17.92	6.37	0.216	-6.1	1.30	1.52			10.26
9	0943	250	17.94	6.36	0.215	-5.3	1.28	1.44			10.26

JB 2/2/10

3. SAMPLE COLLECTION DATA Sampling Personnel: RH, JB

Sampling Method(s) & Equip: Peristaltic pump w/ teflon-lined tubing

Sample I.D. (Name, Date, Time): ITW-22-020210, 2/2/10, 0945

Sample Analytical Parameters/Method:

SVOC's (NO PENTA) (SW846 8270), VOC's (SW846 8260B)

Sample Start Time: 0945 End SampleTime: 1014

COMMENTS: W.L.: (20323)

Creosote odor from creosote railroad ties surrounding well (approx 5' away), Small brown root-like particles in water

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: M-9AR

PERMIT NO.:

roject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: partly cloudy, ~ 50°F Sampling Date: 2/2/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 10.00 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 17.58 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 7.58 (ft) (a-d)

h. Well Volume: 1.24 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic pump (SN 001101)

b. Field Testing Equipment: YSI 556 (05M195A1) LaMotte (ME10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 2.08 (gal)

e. Begin Purge Time: 1455 End Purge Time: 1530

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
I	1455	225	18.30	7.92	0.130	-61.2	6.62	11.3			10.10
PURGING VALUES											
1	1500	225	18.29	6.40	0.124	1.5	5.16	11.4			10.09
2	1505	225	18.33	6.06	0.125	10.5	4.88	11.3			10.10
3	1510	225	18.30	5.87	0.130	20.1	0.92	11.4			10.10
4	1515	225	18.32	5.81	0.133	22.4	0.86	10.6			10.11
5	1520	225	18.34	5.79	0.136	23.4	0.84	8.42			10.11
6	1525	225	18.38	5.75	0.136	21.1	0.80	7.77			10.11
7	1530	225	18.39	5.72	0.136	20.9	0.78	7.58			10.11

2/2/10

3. SAMPLE COLLECTION DATA

Sampling Personnel: RH, JB

Sampling Method(s) & Equip: Peristaltic pump w/ dedicated teflon-lined tubing

Sample I.D. (Name, Date, Time): VOC's (SW8468260B) SVOC's (SW8468260B) (NO PENTA)

Sample Analytical Parameters/Method: Total As (SW846 6020), Dissolved As (SW846 6020)

M-9AR-020210, 2/2/10, 1530

mple Start Time: 1530 End SampleTime: 1600

COMMENTS:

M.I. (20329) Collected FB02-020210 near M-09AR: 1610

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: MW-9BR

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: N wind 10-15 mph, 50's Sunny Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 9.35 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 28.22 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 18.87 (ft) (a-d)

h. Well Volume: 3.08 (gal)

Conversion Factors (a x cf = b)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic pump (001101)

b. Field Testing Equipment: YSI (OMD195541) LaMotte (10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: .79 (gal)

e. Begin Purge Time: 0955 End Purge Time: 1025

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
I	0955	100	16.14	5.82	0.049	24.6	4.92	1.48			9.78
PURGING VALUES											
1	1000	100	17.48	5.05	0.084	20.0	0.40	1.31			9.99
2	1005	100	18.08	4.85	0.084	16.7	0.27	1.22			10.00
3	1010	100	18.10	4.83	0.082	17.1	0.21	1.20			9.97
4	1015	100	18.16	4.75	~~0.084~~ 0.082	17.4	0.23	1.04			9.98
5	1020	100	18.20	4.76	0.082	17.0	0.20	0.97			9.98
6	1025	100	18.24	4.76	0.080	16.4	0.20	1.01			9.98

3. SAMPLE COLLECTION DATA

Sampling Personnel: RH, JB

Sampling Method(s) & Equip: Peristaltic pump w/ dedicated teflon-lined tubing

Sample I.D. (Name, Date, Time): MWBR-020310, 2/3/10, 1025

Sample Analytical Parameters/Method: SVOC's (NOPENTA - SW846 8270C), BTEX (SW846 8260B), Dissolved As (SW846 6020), Total As (SW846 6020)

Sample Start Time: 1025 End SampleTime: 1055

COMMENTS:

VE (20325) Rental

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: M-16B

PERMIT NO.:

roject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Sunny, ~60°F Sampling Date: 2/4/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 9.23 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 23.11 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 13.88 (ft) (a-d)

h. Well Volume: 2.62 gal (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Low Flow

b. Field Testing Equipment: YSI 556 (OSM1955AJ) / Lamotte (10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: .99 (gal)

e. Begin Purge Time: 0955 End Purge Time: 1020

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
+	0951	150	18.60	4.03	0.065	90.3	4.28	21.10			9.50
PURGING VALUES											
1	1000	150	18.88	4.23	0.065	82.2	0.186	12.40			9.51
2	1005	150	19.17	4.30	0.064	79.0	0.56	8.43			9.51
3	1010	150	19.19	4.42	0.062	74.5	0.38	7.37			9.52
4	1015	150	19.29	4.46	0.062	73.7	0.39	6.27			9.53
5	1020	150	19.28	4.51	0.061	71.8	0.37	5.08			9.52

3. SAMPLE COLLECTION DATA Sampling Personnel: JB/RH

Sampling Method(s) & Equip: Peristaltic Pump w/ Dedicated Teflon Lined Tubing

Sample I.D. (Name, Date, Time): M-16B-020410 2/4/10 1020

Sample Analytical Parameters/Method: SVOC: 8270C, BTEX: 8260B, Total & Dissolved As: 6020

Sample Start Time: 1020 End SampleTime: 1040

COMMENTS:

W.L. (20323)

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: M-17

PERMIT NO.:

oject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: breezy ~60°F Sunny Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 11.34 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 15.16 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 3.82 (ft) (a-d)

h. Well Volume: .62 (gal)

Conversion Factors (a x cf = b)	
Well I.D.	Conv. Fact. (cf)
1	0.041
②	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic pump (000110)

b. Field Testing Equipment: YSI (05M1955A1) Lamotte (10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.85 (3-4)

e. Begin Purge Time: 1310 End Purge Time: 1345

Read No.	Lapse Time (min.)	(ml/min) Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
PP	1310	200	19.04	6.22	0.163	-53.0	10.99	2.65	—	—	11.43
PURGING VALUES											
1	1315	200	18.68	5.14	0.154	-59.1	0.31	2.41	—	—	11.44
2	1320	200	18.63	5.06	0.152	-62.3	0.26	2.34	—	—	11.44
3	1325	200	18.64	4.93	0.141	-42.1	0.23	1.98	—	—	11.45
4	1330	200	18.65	4.92	0.141	-38.2	0.20	1.44	—	—	11.45
5	1335	200	18.64	4.93	0.140	-37.9	0.18	1.29	—	—	11.45
6	1340	200	18.64	4.93	0.140	-37.4	0.17	1.17	—	—	11.45
7	1345	200	18.61	4.93	0.139	-36.8	0.17	1.11	—	—	11.45

1340

3. SAMPLE COLLECTION DATA Sampling Personnel: RH, JB

Sampling Method(s) & Equip: Peristaltic pump w/ teflon-lined tubing

Sample I.D. (Name, Date, Time): M-17-020310, 2/3/10, 1345

Sample Analytical Parameters/Method: BTEX (8260B), SVOC's (8270C), Total & Diss As (6020)

nple Start Time: 1345 End SampleTime: 1500

COMMENTS:

MS (29327) Collected MS/MSD: 1345

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: M-20B

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Sunny ~ 60°F Sampling Date: 2/3/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 10.25 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: ~~25.29~~ 25.29 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 15.04 (ft) (a-d)

h. Well Volume: 2.45 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Low Flow

b. Field Testing Equipment: YSI (or m1955 A2) / LaMotte (10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.12 Gal (1)

e. Begin Purge Time: 1430 End Purge Time: 1505

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
Int	1430	200	19.32	4.42	0.145	13.1	2.59	7.59			10.61
PURGING VALUES											
1	1435	150	19.08	4.00	0.164	-23.4	2.40	5.21			10.79
2	1440	100	18.98	3.82	0.163	-11.6	2.30	3.87			10.81
3	1445	100	18.94	3.63	0.162	-5.7	0.80	2.97			10.81
4	1450	100	18.96	3.64	0.161	-3.1	0.74	1.67			10.82
5	1455	100	18.98	3.64	0.161	4.2	0.50	1.03			10.82
6	1500	100	18.96	3.63	0.160	4.9	0.49	0.92			10.83
7	1505	100	18.96	3.63	0.160	5.3	0.49	0.89			10.83

2/3/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JB/RH

Sampling Method(s) & Equip: Peristaltic (Geotech) w/ Dedicated Teflon Lined Tubing

Sample I.D. (Name, Date, Time): M-20B-020310 2/3/10 1505

Sample Analytical Parameters/Method: BTEX (8260B), SVOC's (8270C), Total & Diss. As (6020)

Sample Start Time: 1505 End SampleTime: 1535

COMMENTS:

W.L. (29323) @ slowest possible purge rate

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: M-23BR

PERMIT NO.:

roject No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Sunny, ~55°F Sampling Date: 2/4/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 10.63 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 25.77 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 15.14 (ft) (a-d)

h. Well Volume: 2.47 (gal)

2. WELL PURGE DATA

a. Purge Method: Peristaltic Pump (051101) w/ Dedicated Teflon Lined Tubing

b. Field Testing Equipment: YSI 556 (05M+955AD) / La Motte (10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.41 (gal)

e. Begin Purge Time: 0855 End Purge Time: 0920

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
Int	0855	175	17.45	4.89	0.182	57.3	5.46	4.65			10.65
PURGING VALUES											
1	0900	175	18.31	4.71	0.180	64.0	4.00	4.59			10.65
2	0905	240	19.21	4.59	0.179	68.7	0.65	4.50			10.68
3	0910	240	19.40	4.57	0.177	69.2	0.29	3.81			10.69
4	0915	240	19.45	4.57	0.179	69.4	0.28	3.44			10.69
5	0920	240	19.48	4.54	0.179	70.1	0.27	2.98			10.70

2/4/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JB

Sampling Method(s) & Equip: Peristaltic w/ Dedicated Teflon Lined Tubing

Sample I.D. (Name, Date, Time): M-23BR-020410 2/4/10 0920

Sample Analytical Parameters/Method: SVOC, 8270C, BTEX: 8260B, Total & Dissolved As: 6020

nple Start Time: 0920 End SampleTime: 0945

COMMENTS:

W.L. (20323)

C:\Documents and Settings\jbzorek\Desktop\josh bzorek\Gainesville\2 Groundwater Sample Collection Record_May 2009

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: M-25B

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: Gainesville 1st Qtr/SA GW Event 2010 Project Location: Gainesville, FL

Weather Conditions: Sunny, ~60°F Sampling Date: 2/4/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 10.75 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 25.05 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 14.30 (ft) (a-d)

h. Well Volume: 2.33 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic pump (001101)

b. Field Testing Equipment: YSI (05M1955A1) LaMotte (10613)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 2.38 (gal)

e. Begin Purge Time: 1055 End Purge Time: 1149

Read No.	Lapse Time (min.)	ml/min Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
I	1055	200	17.86	5.72	3.849	25.6	5.84	5.71			10.95
PURGING VALUES											
1	1100	200	18.08	5.99	3.959	15.2	0.29	2.88			10.96
2	1105	200	18.23	6.05	3.966	13.3	0.21	2.25			10.97
3	1110	200	18.65	6.12	3.965	10.8	0.15	2.14			10.97
4	1115	200	18.69	6.12	3.958	7.6	0.14	2.01			10.96
5	1120	200	18.92	6.14	3.874	-1.1	0.13	1.98			10.96
6	1125	200	18.95	6.17	3.869	-1.4	0.11	1.80			10.96
7	1130	200	18.96	6.18	3.859	-1.9	0.11	1.71			10.96
8	1135	200	18.98	6.19	3.828	-2.6	0.11	1.44			10.96
9	1140	200	18.98	6.19	3.822	-3.9	0.10	1.39			10.96

JB 2/4/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JB/RH

Sampling Method(s) & Equip: Peristaltic Pump w/ Dedicated Teflon Lined Tubing

Sample I.D. (Name, Date, Time): M-25B-020410 2/4/10 1140

Sample Analytical Parameters/Method: SVOC: 8270C, BTEX: 8260B, Total & Dissolved As: 6020

Sample Start Time: 1140 End SampleTime: 1217

COMMENTS:

WL 20323 Collected duplicate M-99E-020410: 2000

Westbay Instruments Inc.
A Schlumberger Company

Probe SN: 4071
Magi SN: 4129

Groundwater Sampling
Field Data Sheet

Date: 2/1/10
Start Time: 0800
End Time: 1240
Technicians: RH, JB

Project: Gainesville, FL
Monitoring Well No: FW-4C
Sampling Zone No(s): 1,2,3

Ambient pressure: 14.65

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
1	1								99.77		96.71		96.71			99.53		
1	1	✓	✓	✓	✓	✓	✓	316.3'	99.53	✓	96.43	✓	96.44	✓	✓	99.15	5	0900
1	2	✓							98.96		96.70		96.70			98.79		
1	2	✓	✓	✓	✓	✓	✓	317.2'	98.19	✓	96.44	✓	96.44	✓	✓	98.10	3	
1	3																	
1	4																	
1	5							2 1140										
1	6																	
1	7																	
2	1								111.95		109.19		109.19			111.91		
2	1	✓	✓	✓	✓	✓	✓	347.1'	111.73	✓	108.94	✓	108.94	✓	✓	111.70	5	0930
2	2								111.44		109.19		109.19			111.43		
2	2	✓	✓	✓	✓	✓	✓	345.4	110.79	✓	108.94	✓	108.94	✓	✓	110.77	3	
2	3																	
2	4																	
2	5																	
2	6							2 1140										
2	7																	

Additional Comments: (pH, Turbidity, S.C., etc.)

Cloudy, 45°, NE breeze 10-15 mph

Westbay Instruments Inc.
A Schlumberger Company

probe SN : 4071
Magi SN : 4129
Ambient 14.60 psi

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-4C
Sampling Zone No(s): 1,2,3

Date: 2/1/10
Start Time: 0800
End Time: 1240
Technicians: RH, JB

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out [ ] Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
3	1								120.57		117.86		117.87			120.52		
3	1	✓	✓	✓	✓	✓	✓	365.9'	119.99	✓	117.58	✓	117.58	✓	✓	119.90	4	1000
3	2								120.07		117.85		117.87			120.05		
3	2	✓	✓	✓	✓	✓	✓	366.9'	119.93	✓	117.59	✓	117.60	✓	✓	119.89	4	
3	3																	
3	4																	
3	5																	
3	6																	
3	7																	

Additional Comments: (pH, Turbidity, S.C., etc.)

calm, overcast, 60°

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-22B
Sampling Zone No(s): 1,4,2,3

Probe SN: 4071
Mag: SN: 4129
Ambient: 14.60 p.s.i.

Date: 2/1/10
Start Time: 1300
End Time: ~~1445~~ 1615
Technicians: RH, JB

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
1	1								28.06		23.33		23.33			28.04		
1	1	✓	✓	✓	✓	✓	✓	154.5'	27.83	✓	23.11	✓	23.10	✓	✓	27.83	5	1340
1	2								28.04		23.34		23.34			28.03		
1	2	✓	✓	✓	✓	✓	✓	154.5'	27.32	✓	23.11	✓	23.10	✓	✓	27.32	4	
1	3																	
1	4																	
1	5																	
1	6																	
1	7																	
4	1								51.89		47.12		47.12			51.88		
4	1	✓	✓	✓	✓	✓	✓	209.1'	51.64	✓	46.89	✓	46.89	✓	✓	51.60	5	1415
4	2								51.86		47.12		47.13			51.85		
4	2	✓	✓	✓	✓	✓	✓	209.7'	51.14	✓	46.89	✓	46.89	✓	✓	51.14	4	
4	3								51.83		47.12		47.12			51.83		
4	3																	
4	4								51.82		47.12		47.12			51.82		
4	4																	
4	5																	
4	6																	
4	7																	

2/1/10

Additional Comments: (pH, Turbidity, S.C., etc.)

Calm, overcast, 60°

Westbay Instruments Inc.
A Schlumberger Company

probe SN : 4071
Magi SN : 4129
Ambient pressure : 14.65
cloudy, 45°, NE breeze 10-15 mph

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-22B
Sampling Zone No(s): 1,4,2,3

Date: 2/1/10
Start Time: 1300
End Time: 1625
Technicians: RH, JB

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes Time
2	1								36.58		31.98		31.98			36.58	
2	1	✓	✓	✓	✓	✓	✓	174.9'	36.40	✓	31.76	✓	31.76	✓	✓	36.40	5 1500
2	2								36.57		31.98		31.98			36.56	
2	2	✓	✓	✓	✓	✓	✓	174.9'	35.88	✓	31.76	✓	31.76	✓	✓	35.86	4
2	3																
2	4																
2	5							2/1/10									
2	6																
2	7																
3	1								45.21		40.63		40.63			45.20	
3	1	✓	✓	✓	✓	✓	✓	194.9'	45.02	✓	40.41	✓	40.41	✓	✓	44.99	5 1610
3	2								45.18		40.61		40.60			45.18	
3	2	✓	✓	✓	✓	✓	✓	195.0'	43.99	✓	40.41	✓	40.41	✓	✓	43.98	4
3	3																
3	4																
3	5							2/1/10									
3	6																
3	7																

Additional Comments: (pH, Turbidity, S.C., etc.)

FB01 collected at 1630
EB01 collected at 1700

SN# 3535

1:54 pm 55° no wind

Ambient 14.63

Westbay Instruments Inc.

A Schlumberger Company

Groundwater Sampling

Field Data Sheet

Date: 2/1/10

Start Time: 1520

End Time: 1655

Technicians: GB JL

Project: Gainesville, FL

Monitoring Well No: FW-24C

Sampling Zone No(s): 1,4,3,2

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	
1	1								96.73		88.79		88.79			96.72	1520
1	1	✓	✓	✓	✓	✓	✓	308.0	96.17	✓	88.55	✓	88.55	✓	✓	96.16	5 tubes
1	2								96.69		88.78		88.79			96.60	
1	2	✓	✓	✓	✓	✓	✓	308.0	96.15	✓	88.57	✓	88.57	✓	✓	96.15	5 tubes
1	3	✓	✓	✓	✓	✓	✓	307.7	96.13	✓	88.57	✓	88.57	✓	✓	96.11	5 tubes
1	4	✓	✓	✓	✓	✓											
1	5													2/1/10			
1	6																
1	7																
4	1								122.53		114.65		114.65			122.52	1625
4	1	✓	✓	✓	✓	✓	✓	367.0	121.96	✓	114.43	✓	114.42	✓	✓	121.96	5 tubes
4	2								122.49		114.64		114.64			122.49	
4	2	✓	✓	✓	✓	✓	✓	367.0	121.96	✓	114.44	✓	114.43	✓	✓	121.94	5 tubes
4	3																
4	4																
4	5						2/1/10										
4	6																
4	7																

Duplicate Performed MW9A-020110 FW24C-1-020110 1530

8260B 8270C

FW24C-020110 1635

Additional Comments: (pH, Turbidity, S.C., etc.)

Overcast, light rain 55° winds calm
SN# 3535
Ambient 14.57

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Date: 2/2/10
Start Time: 0740
End Time: 0835
Technicians: ZB, JC

Project: Gainesville, FL
Monitoring Well No: FW-24C
Sampling Zone No(s): 1,4,3,2

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	
3	1								113.73		106.00		106.01			113.74	
3	1	✓	✓	✓	✓	✓	✓	347.2	112.69	✓	105.78	✓	105.78	✓	✓		4 tubes
3	2								113.69		106.01		106.00			113.71	
3	2	✓	✓	✓	✓	✓	✓	347.0	112.66	✓	105.79	✓	105.79	✓	✓	112.65	4 tubes
3	3																
3	4																
3	5																
3	6																
3	7																
2	1								105.01		97.39		97.39			105.01	
2	1	✓	✓	✓	✓	✓	✓	327.3	103.98	✓	97.18	✓	97.17	✓	✓	103.98	4 tubes
2	2								104.99		97.39		97.39			104.99	
2	2	✓	✓	✓	✓	✓	✓	327.1	103.96	✓	97.18	✓	97.18	✓	✓	103.95	4 tubes
2	3								104.95		97.39		97.39			104.96	
2	3																
2	4								104.41		97.39		97.39			104.39	
2	4																
2	5																
2	6																
2	7																

FW24C-3-020210 2/2/10 0800

FW24C-2-020210 2/2/10 0835

Additional Comments: (pH, Turbidity, S.C., etc.)

Overcast rain showers 60° winds calm
Ambient 14.58
SN# 3535

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Date: 2/2/10
Start Time: 0925
End Time: 1120
Technicians: GB/JL

Project: Gainesville, FL
Monitoring Well No: FW-22C
Sampling Zone No(s): 3,2,1

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	
3	1								121.20		114.42		114.42			121.19	FW22C-3-mod10 0940 2/2/10
3	1	✓	✓	✓	✓	✓	✓	365.1	120.00	✓	114.17	✓	114.16	✓	✓	120.01	4 tubes
3	2								121.18		114.42		114.42			121.17	
3	2	✓	✓	✓	✓	✓	✓	365.2	120.01	✓	114.18	✓	114.17	✓	✓	119.99	4 tubes
3	3																
3	4																
3	5																
3	6																
3	7																
2	1								114.63		107.95		107.95			114.62	FW22C-2-mod10 1010 2/2/10
2	1	✓	✓	✓	✓	✓	✓	350.3	113.46	✓	107.72	✓	107.70	✓	✓	113.46	4 tubes
2	2								114.58		107.95		107.95			114.58	
2	2	✓	✓	✓	✓	✓	✓	348.8	113.97	✓	107.72	✓	107.72	✓	✓	113.96	4 tubes
2	3																
2	4																
2	5																
2	6																
2	7																

Additional Comments: (pH, Turbidity, S.C., etc.)

Overcast light rain 60° winds calm
Ambient 14.59
SN# 3535

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Date: 2/2/10
Start Time: 0925
End Time: 1120
Technicians: GB/JL

Project: Gainesville, FL
Monitoring Well No: FW-22C
Sampling Zone No(s): 3,2,1

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	
1	1								102.75		95.89		95.89			102.76	
1	1	✓	✓	✓	✓	✓	✓	322.3	101.28	✓	95.66	✓	95.65	✓	✓	101.28	4 tubes
1	2								102.71		95.89		95.89			102.71	
1	2	✓	✓	✓	✓	✓	✓	321.4	101.29	✓	95.65	✓	95.64	✓	✓	101.28	4 tubes
1	3								102.69		95.88		95.89			102.68	
1	3																
1	4								101.67		95.89		95.89			101.66	
1	4																
1	5																
1	6																
1	7																

2/2/10

FW22C-1-020210
2/2/10 1040

Additional Comments: (pH, Turbidity, S.C., etc.)

FW-12B

FTS

Westbay Groundwater Sampling

Field Data Sheet

Probe #3535

Ambient: 14.76

Date: 11/2/10
Start Time: 1430
End Time: 1710
Technicians: PH

24,43

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm port ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes Time
2	1	✓	✓	✓	✓	✓	✓	175.5'	33.52	✓	30.99	✓	30.98	✓	✓	33.52	5 1500
	2	✓	✓	✓	✓	✓	✓	175.6	33.00	✓	30.99	✓	30.99	✓	✓	32.99	4
									11/2/10								
1	1	✓	✓	✓	✓	✓	✓	156.0'	24.76	✓	22.35	✓	22.34	✓	✓	24.76	5 1540
	2	✓	✓	✓	✓	✓	✓	156.2	24.24	✓	22.32	✓	22.32	✓	✓	24.24	4
									11/2/10								

FW12B

Westbay Groundwater Sampling

Field Data Sheet

Date: 11/12/10
Start Time: 1430
End Time: 1710
Technicians: RH

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP [ ]	Shoe Out	Zone Pressure [ ]	Open Valve	Zone Pressure [ ]	Close Valve	Shoe In	Pressure in MP [ ]	Tubes	Time
4	1	✓	✓	✓	✓	✓	✓	216.1	50.69	✓	48.30	✓	48.30	✓	✓	50.67	5	1615
	2	✓	✓	✓	✓	✓	✓	216.7	50.19	✓	48.30	✓	48.20	✓	✓	50.17	4	
3	1	✓	✓	✓	✓	✓	✓	197.2	41.97	✓	39.66	✓	✓	39.65	✓	41.95	5	1650
	2	✓	✓	✓	✓	✓	✓	197.7	41.44	✓	39.66	✓	✓	39.65	✓	41.34	4	

FW-16B

2361

Page 1 of 2

Probe #3535

Ambient: 14.77

Westbay Groundwater Sampling

Field Data Sheet

Date: 1/11/10
Start Time: 1120
End Time: 1600
Technicians: RH

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	(locate port: ↑ Arm out ↓ Land probe ↓)	Pressure in MP [ ]	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure [ ]	Close Valve	Shoe In	Pressure in MP [ ]	Tubes / Time
2	1	✓	✓	✓	✓	✓	✓	184.5'	43.21	✓	36.13	✓	36.12	✓	✓	43.18	5 1220
	2	✓	✓	✓	✓	✓	✓	184.5'	42.58	✓	36.12	✓	36.12	✓	✓	42.56	4
									1.66 1/12/10								
3	1	✓	✓	✓	✓	✓	✓	204.6'	51.68	✓	44.79	✓	44.78	✓	✓	51.54	5 1310
		✓	✓	✓	✓	✓	✓	204.5'	50.98	✓	44.78	✓	44.78	✓	✓	50.86	4
									1/12/10								

Sunny, 30°

FW-16D

FTS

Westbay Groundwater Sampling

Field Data Sheet

Date: 11/1/10
Start Time: 1120
End Time: 1600
Technicians: BH

2,3,4,1

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port [ ] Arm port [ ] land probe [ ]	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP 59.73 '	Tubes	Time
4	1	✓	✓	✓	✓	✓	✓	224.1'	59.93	✓	53.44	✓	53.42	✓	✓	59.78	5	1440
	2	✓	✓	✓	✓	✓	✓	224.6'	59.19	✓	53.44	✓	53.47	✓	✓	59.17	4	
1	1	✓	✓	✓	✓	✓	✓	165.4'	33.51	✓	27.46	✓	27.45	✓	✓	33.0	5	1530
	2	✓	✓	✓	✓	✓	✓	165.7'	33.01	✓	27.47	✓	27.46	✓	✓	33.06	4	

Probe #3535

FW20B

FTS

3,4,2,1

Page 1 of 2

Westbay Groundwater Sampling

Field Data Sheet

Ambient: 14.77

Date: 1/12/10
Start Time: 1100
End Time:
Technicians: RH

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Load probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tether	Time
3	1	✓	✓	✓	✓	✓	✓	196.3'	46.46	✓	46.45	✓	46.41	✓	✓	46.41	5	1150
	2	✓	✓	✓	✓	✓	✓	196.7'	45.89	✓	46.45	✓	46.45	✓	✓	45.87	4	
								772	1/12/10									
4	1	✓	✓	✓	✓	✓	✓	216.8'	54.96	✓	49.10	✓	49.10	✓	✓	54.94	5	1230
	2	✓	✓	✓	✓	✓	✓	217.1'	54.96	✓	49.10	✓	49.10	✓	✓	54.94	4	
									1/12/10									

FB01-011210 collected @ 1300

Milford

FW20D

FTS

3,4,2,1

Westbay Groundwater Sampling

Field Data Sheet

Date: 1/12/10
Start Time: 1100
End Time: 1400
Technicians: RH, MT

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
2	1	✓	✓	✓	✓	✓	✓	177.7'	37.47	✓	31.80	✓	31.80	✓	✓	37.40	5	1310
	2	✓	✓	✓	✓	✓	–	177.9'	36.89	✓	31.80	✓	31.80	✓	✓	36.89	4	
1	1	✓	✓	✓	✓	–	–	18.4'	28.67	✓	23.15	✓	23.16	✓	✓	28.67	5	1340
	2	✓	✓	✓	✓	✓	✓	158.6'	28.15	✓	23.15	✓	23.15	✓	✓	28.16	4	

1/12/10

FW-23C

FTS

Probe: 3535

Westbay Groundwater Sampling
Field Data Sheet

Date: 3/2/10
Start Time: 1500
End Time: 1715
Technicians: RH, MT

Ambient: 14.37

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Load probe	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
2	1	✓	✓	✓	✓	✓	✓	344.2'	112.35	✓	109.59	✓	109.60	✓	✓	112.36	4	1540
	2	✓	✓	✓	✓	✓	✓	346.7'	112.31	✓	109.60	✓	109.60	✓	✓	112.32	4	
3	✓	✓	✓	✓	✓	✓	✓	364.2'	119.97	✓	118.23	✓	118.23	✓	✓	119.97	2	1700
	✓	✓	✓	✓	✓	✓	✓	364.4'	119.95	✓	118.23	✓	118.23	✓	✓	119.96	2	
	✓	✓	✓	✓	✓	✓	✓	367.9'	120.41	✓	118.23	✓	118.23	✓	✓	120.42	3	

3/7/10

3/3/10

Windy, partly cloudy 60°

FW-23C

Probe #3535

Westbay Groundwater Sampling

Field Data Sheet

Date: 3/3/10
Start Time: 0830
End Time: 1015
Technicians: PH

3/3/10 Ambient: 14.57

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) from out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	
1		✓	✓	—	—	—	—	312.3'	98.53	✓	95.82	✓	71.51	✓	✓	98.53	4 0930 Tubes Time
		✓	—	—	—	—	—	312.7'	98.05	✓	95.81	✓	75.80	—	—	98.06	3

Calm, cloudy 45°

Field Technical Services LLC
RCRA Facility Groundwater Monitoring Well Inspection

FTS

Site Name: Gainesville, FL
Site Phone: _____
Inspector Name: G. Bozek
Audit Date: 2/1/10
~~KII~~ FTS Contact: Rory Hanczer
KII Phone: _____
Inspector Signature: [signature]

Well Condition

Well ID	Lock	Casing	Cap	Pad/ Drainage	Vegetation/ Accessibility	Potential Hazards	Depth to Water	Total Depth	Depth to Product	Product Thickness	Comments/ Repair Required
FW25B	GC	GC	GC	GC	GC	None	108.82	230.0	NP	NA	PID 45.0
ITW-22	GC	GC	GC	weathered	GC	Rail Road	10.25	16.55	NP	NA	0.3 PID
ITW-12	GC	GC	GC	NR	GC	Recycle yard.	6.89	19.85	NP	NA	10.1 PID
HG 24S	GC	GC	GC	cracked	GC	Traffic	14.45	71.55	NP	NA	1.2 PID needs 2 bolts
HG 27S	NR	GC	GC	GC	GC	None	8.16	59.66	NP	NA	0.0 PID
FW 25C	GC	GC	GC	GC	GC	None	109.40	380.0	NP	NA	0.0 PID
FW 4	GC	GC	GC	GC	GC	None	129.90	159.70	NP	NA	11.3 PID
FW 26C	GC	GC	GC	GC	GC	None	110.11	353.98	NP	NA	0.0 PID
HG 27D	NR	GC	GC	GC	GC	None	32.25	96.22	NP	NA	0.0 PID
FW 26 B	GC	GC	GC	GC	GC	None	~~NA~~ 111.31	~~NA~~ 340.0	NP	NA	0.0 PID
HG 23D	GC	GC	GC	GC	GC	Traffic	52.45	89.25	NP	NA	21 PID

FM = Flush Mount * GC = Good Condition * NL = Needs Lock * NR = Needs Replaced * RP = Replaced Lock * SU = Stick Up

Field Technical Services LLC
RCRA Facility Groundwater Monitoring Well Inspection

FTS

Well Condition

Well ID	Lock	Casing	Cap	Pad/ Drainage	Vegetation/ Accessibility	Potential Hazards	Depth to Water	Total Depth	Depth to Product	Product Thickness	Comments/ Repair Required
HG 25D	GC	GC	GC	GC	GC	Traffic	51.44	85.71	NP	NA	Pid 11 missing 1 bolt
HG 22D	NL	GC	GC	Cracked	GC	None	43.85	~~82.36~~	~~NP~~ NP	NA	PID 0.0
M-09 NR	GC	GC	GC	GC	GC	Fire Ants	9.27	~~28.22~~ 17.58	NP	NA	PID 0.0
HG-5D	GC	GC	GC	GC	GC	None	55.53	112.71	NP	NA	PID 1.4
HG 21S	GC	GC	GC	GC	GC	Traffic	9.71	40.52	NP	NA	Pid 0.0
HG 20D	GC	GC	GC	GC	GC	Recycle yard	37.82	83.96	NP	NA	Pid 0.0
HG 26D	GC	GC	GC	~~Cracked~~ GC	GC	None	40.11	93.80	NP	NA	PID 0.0
HG-6S	GC	GC	GC	GC	GC	None	13.66	52.65	NP	NA	PID 30.8
FW21B	GC	GC	GC	GC	GC	None	NA	NA	NA	NA	West Bay Well
HG20S	GC	GC	NR	GC	GC	Recycle yard	6.95	39.56	NP	NA	Pid 0.0
HG 2D	GC	GC	GC	GC	GC	None	53.83	112.76	NP	NA	Pid 3.7
M33B	GC	GC	~~Needs~~ GC	~~Needs GC~~	GC	None	9.74	27.09	NP	NA	PID 2.4
M-17	GC	GC	GC	GC	GC	None	11.31	15.16	NP	NA	PID 15.4
HG 21D	GC	GC	GC	GC	GC	Traffic	36.55	94.62	NP	NA	Pid 0.0 No bolts
HG ~~20S~~ 21D						~~None~~ Traffic					

FM = Flush Mount * GC = Good Condition * NL = Needs Lock * NR = Needs Replaced * RP = Replaced Lock * SU = Stick Up

Field Technical Services LLC
RCRA Facility Groundwater Monitoring Well Inspection

Well Condition

Well ID	Lock	Casing	Cap	Pad/ Drainage	Vegetation/ Accessibility	Potential Hazards	Depth to Water	Total Depth	Depth to Product	Product Thickness	Comments/ Repair Required
M-20B	GC	GC	GC	GC	GC	None	10.21	25.29	NP	NA	PID 18.2
HG 4S	GC	GC	GC	GC	GC	Fire Ants	11.47	52.40	NP	NA	PID 9.7
HG 4D	GC	GC	GC	GC	GC	Fire Ants	43.04	100.28	NP	NA	PID 4.5
FW-6	GC	GC	GC	GC	GC	None	NA	NA	NA	NA	Pumping Well
HG 26S	GC	GC	GC	GC	GC	None	12.42	44.12	NP	NA	PID 0.0
M 23BR	GC	GC	GC	GC	GC	Fire Ants	10.58	25.79	NP	NA	PID 2.2
HG 6D	GC	GC	GC	GC	GC	None	41.42	109.64	NP	NA	PID 6.1
M-16B	GC	GC	GC	GC	GC	None	9.28	23.11	NP	NA	PID 46.7
M-25B	GC	GC	GC	NR	GC	None	10.77	25.05	NP	NA	PID 18.2
M-25D	GC	GC	GC	GC	GC	None	41.15	96.38	NP	NA	PID 4.1
M-29S	GC	GC	GC	GC	GC	None	15.67	54.28	NP	NA	PID 65.2
M-09BR	GC	GC	GC	GC	GC	None	9.52	28.22	NP	NA	PID 0.0

FM = Flush Mount * GC = Good Condition * NL = Needs Lock * NR = Needs Replaced * RP = Replaced Lock * SU = Stick Up

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: FW-28B

PERMIT NO.: Zone 1

Project No.: 40-045010-05 Client: Beazer, Inc.

Project Name: Gainesville, FL Project Location: Gainesville, FL

Weather Conditions: Sunny, calm 55° Sampling Date: 3/16/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: (bTOC) 132.62 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 230 (ft)

e. LNAPL Thickness: (a-b) NP (ft) f. DNAPL Thickness: (c-d) NP (ft)

g. Length of Water Column: 97.38 (ft) (a-d)

h. Well Volume: 63.59 (gal)

2. WELL PURGE DATA

a. Purge Method: Compressed Nitrogen w/ QED bladder pump

b. Field Testing Equipment: YSI 556 (06M1536AM), LaMotte 2020e (10657)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: NA

e. Begin Purge Time: 1105 End Purge Time: 1155

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
I	1115	225	20.20	7.83	0.446	-216.7	2.03	16.6	—	—	132.64
PURGING VALUES											
1	1120	225	21.34	7.98	0.355	-207	1.17	18.0	—	—	132.62
2	1125	225	21.37	7.97	0.351	-204.6	0.95	17.1	—	—	132.62
3	1130	225	21.40	7.96	0.351	-206.0	0.73	17.4	—	—	132.62
4	1135	225	21.41	7.97	0.351	-212.2	0.64	16.7	—	—	132.62
5	1140	225	21.42	7.95	0.351	-218.7	0.55	16.7	—	—	132.62
6	1145	225	21.43	7.93	0.352	-219.4	0.53	16.5	—	—	132.62
7	1150	225	21.45	7.94	0.352	-221.3	0.52	16.7	—	—	132.62

[signature] 3/16/10

SAMPLE COLLECTION DATA Sampling Personnel: PH

Sampling Method(s) & Equip: QED bladder pump w/ teflon-lined tubing

Sample I.D. (Name, Date, Time): FW28B-01-031610, 3/16/10, 1155

Sample Analytical Parameters/Method: VOC's, SVOC's

Sample Start Time: 1155 End Sample Time: 1215

COMMENTS:

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: FW-28B

PERMIT NO.: Zone 2

Project No.: TO-045010-05 Client: Beazer, Inc.

Project Name: Gainesville Project Location: Gainesville, FL

Weather Conditions: Sunny, calm 50° Sampling Date: 3/16/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b. Depth to Water (btoc) 132.61 (ft)

c. Depth to DNAPL: NP (ft) d. Total Well Depth: 230 (ft)

e. LNAPL Thickness: (a-b) NP (ft) f. DNAPL Thickness: (c-d) NP (ft)

g. Length of Water Column: 97.39 (ft) (a-d)

h. Well Volume: 63.6 (gal)

2. WELL PURGE DATA

a. Purge Method: Compressed Nitrogen w/ QED bladder pump

b. Field Testing Equipment: YSI 556 (06M1536AM) LaMotte (10657)

c. Required Total Purge Volume (1l x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: NA

e. Begin Purge Time: 0920 End Purge Time: 1025

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	mL/min Purge Rate	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
I	0927	200	20.36	7.92	0.414	-198.0	2.40	22.6	—	—	132.67
PURGING VALUES											
1	0932	200	20.84	7.88	0.418	-226.6	1.12	20.1	—	—	132.66
2	0940	200	20.97	7.88	0.422	-238.3	0.85	18.2	—	—	132.66
3	0945	200	21.00	7.87	0.424	-239.5	0.74	16.4	—	—	132.66
4	0950	200	20.97	7.87	0.426	-242.3	0.72	13.0	—	—	132.66
5	0955	200	20.88	7.86	0.430	-242.8	0.64	11.4	—	—	132.66
6	1000	200	21.10	7.85	0.432	-244.6	0.57	11.6	—	—	132.66
7	1005	200	21.04	7.84	0.434	-247.7	0.52	10.8	—	—	132.66
8	1010	200	21.02	7.83	0.435	-247.9	0.48	11.0	—	—	132.66
9	1015	200	20.94	7.83	0.435	-248.1	0.43	11.1	—	—	132.66
10	1020	200	20.92	7.83	0.435	-248.4	0.42	11.1	—	—	132.66

3/16/10

3. SAMPLE COLLECTION DATA Sampling Personnel: PH

Sampling Method(s) & Equip: QED bladder pump w/ teflon-lined tubing

Sample I.D. (Name, Date, Time): FW28B-02-031610, 3/16/10, 1025

Sample Analytical Parameters/Method: VOC's, SVOC's

Sample Start Time: 1025 End Sample Time: 1039

COMMENTS:

FTS

GROUNDWATER SAMPLE

WELL NO.: FW-28B

PURGE NO.: Zone 3

Project No.: TO-045010-05 Client: Beazer, Inc.

Project Name: FW-28B Sample 1119 Project Location: Gainesville, FL

Weather Conditions: Partly cloudy, 60's, stony W wind Sampling Date: 3/15/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) d. Depth to Pump: 132.60 (ft)

b. Depth to DNAPL: NP (ft) e. Total Well Depth: 230 (ft)

c. LNAPL Thickness: NP (ft) f. DNAPL Thickness: NP (ft)

g. Length of Water Column: 97.4 (ft)

h. Well Volume: 63.6 (gal)

2. WELL PURGE DATA

a. Purge Method: Compressed Nitrogen w/ QED bladder pump

b. Field Testing Equipment: YSI 556 (06M1136AM) LaMotte (Rental)

c. Required Total Purge Volume (3 x 2h) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: NA

e. Begin Purge Time: 1550 End Purge Time: 1700

Reading No.	Time (military)	mL/min Pump Rate	Temp (deg C) (Celsius)	pH (std. units) (±0.2)	Spec. Cond. (mS/cm) (±3%)	ORP (mV) (±10mV)	Dissolved Oxygen (mg/L) (±5%)	Turbidity (NTU) (±10 NTU or 10%)	Volume %	LNAPL Vol.	Water Level (ft)
PRE PURGE VALUES											
I	1600	125	21.61	7.70	0.379	-237.4	2.98	40.4	—	—	132.59
PURGING VALUES											
1	1605	125	21.90	7.72	0.389	-253.2	1.21	58.6	—	—	132.60
2	1610	125	21.93	7.72	0.407	-259.3	0.88	47.0	—	—	132.60
3	1620	125	21.92	7.72	0.407	-260.8	0.75	41.5	—	—	132.57
4	1630	125	21.95	7.72	0.408	-260.8	0.58	28.9	—	—	132.55
5	1640	125	21.97	7.73	0.410	-259.0	0.60	22.8	—	—	132.50
6	1645	125	21.91	7.73	0.410	-262.4	0.54	22.3	—	—	132.53
7	1650	125	21.93	7.72	0.410	-258.6	0.56	22.5	—	—	132.54
8	1655	125	21.95	7.72	0.410	-257.7	0.51	22.1	—	—	132.54

3/15/10

3. SAMPLE COLLECTION DATA Sampling Personnel: RH

Sampling Method(s) & Equip.: QED Bladder pump w/ teflon-lined tubing

Sample ID (Duplicate, Blank, Etc.): FW28B-03-03|5|10, 3|15|10,

Sample Analytical Parameters/Method: VOC's SVOC's

Sample Start Time: 1655 Last Sample Time: 1715

4. OBSERVATIONS:

Pump set @ 209' bgs

Purge Volume Disposition: Groundwater Sample Collection Method: Low Flow

FTS

GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: FW-28B

PERMIT NO.: Zone 4

Project No.: TO-045010-0 Client: Beazer, Inc.

Project Name: Gainesville Project Location: Gainesville, FL

Weather Conditions: Sunny, W wind 10-20 mph, Sampling Date: 3/15/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b. Depth to Water (btoc) 132.64 (ft)

c. Depth to DNAPL: NP (ft) d. Total Well Depth: 230.00 (ft)

e. LNAPL Thickness: (ft) NP (ft) f. DNAPL Thickness: (ft) NP (ft)

g. Length of Water Column: 97.36 (ft) (ft)

h. Well Volume: 63.5 (gal)

2. WELL PURGE DATA

a. Purge Method: Compressed Nitrogen w/ QED bladder pump

b. Field Testing Equipment: YSI 556 (06M1536AM) LaMotte 2020e (10637)

c. Required Total Purge Volume (ft x 2) (gal): NA

d. Total Volume and Number of Well Volumes Removed: NA

e. Begin Purge Time: 1240 End Purge Time: 1500

Read No.	Time (min.)	mL/min Purge Rate	Temp (Dec. C) (Constant)	pH (Std.) (±0.2)	Spec. Cond. (Dec. C) (±3%)	Flow (mL) (±10%)	Dissolved (mg/L) (±10%)	TURB (NTU) (±10 NTU or Stable)	Salinity %	TDS G/L	Water Level (ft)
PRE PURGE VALUES											
I	1255	100	20.00	7.75	0.407	-159	6.34	100.2	—	—	132.64'
PURGING VALUES											
1	1300	110	21.17	7.72	0.376	-209.9	2.11	97.2	—	—	132.65
2	1305	110	21.62	7.72	0.383	-224.9	1.15	88.2	—	—	132.64
3	1310	110	21.51	7.73	0.382	-229.1	1.03	87.3	—	—	132.64
4	1315	110	21.33	7.72	0.408	-227.8	0.98	87.3	—	—	132.64
5	1320	110	21.68	7.72	0.408	-232.8	0.88	78.3	—	—	132.64
6	1325	110	21.88	7.72	0.409	-235.5	0.71	66.4	—	—	132.64
7	1330	110	22.00	7.73	0.409	-236.1	0.66	60.1	—	—	132.64
8	1335	110	22.02	7.72	0.409	-241.7	0.64	59.3	—	—	132.64
9	1340	110	22.04	7.72	0.409	-244.6	0.63	59.1	—	—	132.64
10	1355	110	22.07	7.72	0.409	-245.0	0.63	50.6	—	—	132.64
11	1415	110	21.98	7.70	0.408	-245.7	0.62	47.3	—	—	132.64
12	1430	110	21.99	7.70	0.408	-249.6	0.50	38.9	—	—	132.64
13	1440	110	21.45	7.69	0.406	-250.1	0.48	22.5	—	—	132.64
14	1445	110	21.44	7.69	0.405	-250.3	0.48	18.1	—	—	132.64
15	1450	110	21.42	7.69	0.405	-250.6	0.47	18.1	—	—	132.64
16	1455	110	21.39	7.69	0.405	-251.0	0.47	18.4	—	—	132.64

FW-28-04-031510, 1500

VOC's/SVOC's

RH

Sample Date Time: 1500 End Sample Time: 1530

Pump set at 229' bgs.

FTS

WELL NO.: FW-25S

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.: 0M645010-091 **Date:** 5/25/10 **Time: Start:** 0830 am/pm
Project Name: GAINESVILLE 2ND Q 2010 / SENTINEL **Finish:** 1025 am/pm
Location: GAINESVILLE, FL
Weather Conditions: SUNNY 80° **Collector:** Print JEFF WEAVER Sign

1. WATER LEVEL DATA (measured from top of well casing)

a. **Total Casing Length:** 230.00 (ft) b. **Well Casing Type:** SS
c. **Depth to Water:** 107.72 (ft) d. **Casing Diameter:** 4 (in)
e. **Length of Water Column:** 122.28 (ft) (a-c)
f. **Well Volume:** 79.85 (gal)

Conversion Factors (cf)
(e x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
(4)	0.653
6	1.470

2. WELL PURGE DATA

a. **Purge Method:** GRUNDFOS PUMP (09460070)
b. **Field Testing Equipment:** YSI 63 (07K100333) HACH 2100P (0103001)
c. **Number of Well Volumes to Remove:** 3
d. **Required Total Purge Volume (1f x 2c):** 240.0

Vol. Purged (Gallons)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Turbidity (NTU) (<10 NTU or Stable)	Notes
INITIAL	23.1	6.65	.331.2	3.0	CLEAR
80	23.8	7.18	.400	1.7	
160	24.0	7.24	.407	1.9	
200	24.1	7.26	.409	1.1	
240	24.1	7.27	.410	0.8	

3. SAMPLE COLLECTION INFORMATION

Sampling Method(s): DEDICATED TEFLON LINED TUBING
Sample Identification (name, time, date): FW-25S-052510 , 1010 , 5/25/10
QC Samples (name, time, date): N/A

Analytical Parameters and Methods:	BTEX	SVOC'S	TAL-D As
	8260B	8270C	6020

Comments:
SULFER ODOR

WELL NO.: FW-25C

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.: 0M045010-091 Date: 5/25/10 Time: Start: 1395 am/pm
Project Name: GAINESVILLE 2ND Q 2010 / SENTINEL Finish: 1620 am/pm
Location: GAINESVILLE, FL
Weather Conditions: SUNNY 83° Collector: JEFF LOAR (Print) Jeff Loar (Sign)

1. WATER LEVEL DATA (measured from top of well casing)

a. Total Casing Length: 380.00 (ft) b. Well Casing Type: SS
c. Depth to Water: 108.24 (ft) d. Casing Diameter: 4 (in)
e. Length of Water Column: 271.76 (ft) (a-c)
f. Well Volume: 177.5 (gal)

Conversion Factors (cf)
(e x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
(4)	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: GRUNDFOS PUMP (09460070)
b. Field Testing Equipment: YSI 63 (07K100231), HACH 2100P (0163001)
c. Number of Well Volumes to Remove: 3
d. Required Total Purge Volume (1f x 2e): 532.0

Vol. Purged (Gallons)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Turbidity (NTU) (<10 NTU or Stable)	Notes
INITIAL	23.8	7.29	.350	3.6	CLEAR
180	24.4	7.53	.354	2.9	
350	24.5	7.55	.357	2.2	
480	24.6	7.55	.357	1.3	
540	24.6	7.55	.359	1.1	

3. SAMPLE COLLECTION INFORMATION

Sampling Method(s): DEDICATED TEFLON / HAND TURNS
Sample Identification (name, time, date): FW-25C-052510, 1558, 5/25/10
QC Samples (name, time, date): MS / MSD

Analytical Parameters and Methods:	BTEX	SVOC's	TAL AS
	8260B	8270C	6020

Comments:
SULFER ODOR

WELL NO.: FW-26B

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.: 0M045010-091 Date: 5/26/10 Time: Start: 0830 am/pm
Project Name: GAINESVILLE 2ND Q 2010 / SENTINEL Finish: 1050 am/pm
Location: GAINESVILLE FL
Weather Conditions: SUNNY, 80° Collector: JEFF LEAVER (Print) Jeff Leaver (Sign)

1. WATER LEVEL DATA (measured from top of well casing)

a. Total Casing Length: 230.00 (ft) b. Well Casing Type: SS
c. Depth to Water: 110.15 (ft) d. Casing Diameter: 4 (in)
e. Length of Water Column: 119.85 (ft) (a-c)
f. Well Volume: 78.3 (gal)

Conversion Factors (cf) (c x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
(4)	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: GRUNDFOS PUMP (09460070)
b. Field Testing Equipment: YSI 63 (07K100333), HACH 2100P (0103001)
c. Number of Well Volumes to Remove: 3
d. Required Total Purge Volume (1f x 2e): 235.0

Vol. Purged (Gallons)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Turbidity (NTU) (<10 NTU or Stable)	Notes
INITIAL	22.2	8.47	.357	3.0	CLEAR
80	22.9	7.20	.414	1.8	
160	23.1	7.17	.417	1.1	
200	23.3	7.17	.417	0.9	
240	23.3	7.16	.417	0.8	↓

3. SAMPLE COLLECTION INFORMATION

Sampling Method(s): DEDICATED TEFLON LINED TUBING
Sample Identification (name, time, date): FW-26B-052610 1030, 5/26/10
QC Samples (name, time, date): DUP (FW-99A-052610 @2000)

Analytical Parameters and Methods:	BTEX	SVOC's	T+D As.
	8260B	8270C	6020

Comments:
SULFER ODOR

FTS

WELL NO.: FW-26C

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.: OM045010-091 **Date:** 5/25/10 **Time: Start:** 1050 am/pm
Project Name: GAINESVILLE 2ND Q 2010 / SENTINEL **Finish:** 1325 am/pm
Location: GAINESVILLE, FL
Weather Conditions: SUNNY 87° **Collector:** JEFF LEAVER (Print) Jeff Leaver (Sign)

1. WATER LEVEL DATA (measured from top of well casing)

a. **Total Casing Length:** 393.98 (ft) b. **Well Casing Type:** SS
c. **Depth to Water:** 110.06 (ft) d. **Casing Diameter:** 4 (in)
e. **Length of Water Column:** 283.92 (ft) (a-c)
f. **Well Volume:** 185.4 (gal)

Conversion Factors (cf)
(e x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
4	0.653
6	1.470

2. WELL PURGE DATA

a. **Purge Method:** GRUNDFOS PUMP (09460070)
b. **Field Testing Equipment:** YSI 63 (07K100333), HACH 2100P (01031001)
c. **Number of Well Volumes to Remove:** 3
d. **Required Total Purge Volume (1f x 2c):** 556.0

Vol. Purged (Gallons)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Turbidity (NTU) (<10 NTU or Stable)	Notes
INITIAL	24.2	8.60	.198	2.7	CLEAR
190	23.9	8.64	.411	1.6	
350	24.0	8.63	.420	1.0	
480	24.0	8.63	.422	0.9	
560	24.1	8.61	.423	0.9	

3. SAMPLE COLLECTION INFORMATION

Sampling Method(s): DEDICATED TEFLON LINED TUBING
Sample Identification (name, time, date): FW-26C-052510, 1300, 5/25/10
QC Samples (name, time, date): NONE

Analytical Parameters and Methods:	BTEX	SVOC'S	TFD As.	
	8260B	8270C	6020	

Comments:

FTS

WELL NO.: FW-29B

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.: OM045010-091 **Date:** 5/26/10 **Time: Start:** 1110 am/pm
Project Name: GAINESVILLE 2nd Q 2010 / SENTINEL **Finish:** 1340 am/pm
Location: GAINESVILLE, FL
Weather Conditions: SUNNY 87° **Collector:** JEFF LEAVER (Print), Jeff Lamar (Sign)

1. WATER LEVEL DATA (measured from top of well casing)

a. **Total Casing Length:** 252.73 (ft) b. **Well Casing Type:** SS
c. **Depth to Water:** 117.74 (ft) d. **Casing Diameter:** 4 (in)
e. **Length of Water Column:** 134.99 (ft) (a-c)
f. **Well Volume:** 88.2 (gal)

Conversion Factors (cf)
(e x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
4	0.653
6	1.470

2. WELL PURGE DATA

a. **Purge Method:** GRUNDFOS PUMP (09460070)
b. **Field Testing Equipment:** YSI 63 (07K100333), HACH 2100P (0103001)
c. **Number of Well Volumes to Remove:** 3
d. **Required Total Purge Volume (1f x 2c):** 265.0

Vol. Purged (Gallons)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Turbidity (NTU) (<10 NTU or Stable)	Notes
INITIAL	24.0	7.25	.401	11.9	CLEAR
90	24.3	7.13	.370	8.3	
180	24.1	7.09	.365	7.2	
230	24.1	7.07	.364	4.8	
270	24.2	7.07	.365	4.4	

3. SAMPLE COLLECTION INFORMATION

Sampling Method(s): DEDICATED TEFLON LINED TUBING
Sample Identification (name, time, date): FW-29B-052610, 1330, 5/26/10
QC Samples (name, time, date): N/A

Analytical Parameters and Methods:	BTEX	SVOC'S	T+D AS.
	8260B	8270C	6020

Comments:
SEDIMENT ON OUTSIDE OF TUBING AFTER BEING PULLED FROM THE WELL

FTS

WELL NO.: FW-29C

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.: OM045010-091 Date: 5/26/10 Time: Start: 1300 am/pm
Project Name: GAINESVILLE 2ND Q 2010 / SENTINEL Finish: 1600 am/pm
Location: GAINESVILLE, FL
Weather Conditions: SUNNY 87° Collector: JEFF LEAVER (Print) Jeff Leaver (Sign)

1. WATER LEVEL DATA (measured from top of well casing)
   a. Total Casing Length: 377.00 (ft) b. Well Casing Type: SS
   c. Depth to Water: 118.08 (ft) d. Casing Diameter: 4 (in)
   e. Length of Water Column: 258.92 (ft) (a-c)
   f. Well Volume: 169.1 (gal)

Conversion Factors (cf) (e x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
4	0.653
6	1.470

2. WELL PURGE DATA
   a. Purge Method: GRUNDFOS PUMP (09460070)
   b. Field Testing Equipment: YSI 63 (07K100331), HACH 2100P (0103001)
   c. Number of Well Volumes to Remove: 3
   d. Required Total Purge Volume (1f x 2c): 507.00

Vol. Purged (Gallons)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Turbidity (NTU) (<10 NTU or Stable)	Notes
INITIAL	25.1	7.56	.462	6.4	CLEAR
170	25.4	7.26	.430	5.6	
320	25.7	7.20	.421	5.1	
410	25.7	7.19	.418	4.7	
510	25.8	7.19	.417	3.0	

3. SAMPLE COLLECTION INFORMATION
   Sampling Method(s): DEDICATED TEFLON LINED TUBING
   Sample Identification (name, time, date): FW-29C-052610, 1540, 5/26/10
   QC Samples (name, time, date): N/A

   Analytical Parameters and Methods: BTEX 8260B / SVOC'S 8270C / T+D As 6020

Comments:
SEDIMENT ON OUTSIDE OF TUBING AFTER BEING PULLED FROM THE WELL

Westbay Instruments Inc.
A Schlumberger Company

Page 1 of 2

Groundwater Sampling
Field Data Sheet

Mogi SN: 4129
Probe SN: 4071

Project: Gainesville, FL
Monitoring Well No: FW-23B
Sampling Zone No(s): 1,3,4,2

Ambient pressure: 14.44 MP

Date: 5/26/10
Start Time: 1330
End Time:
Technicians: RH, JB

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
1	1								34.07		25.89		25.87			34.07		
1	1	✓	✓	✓	✓	✓	✓	153.0'	33.78	✓	26.02	✓	26.12	✓	✓	33.79	5	1400
1	2								34.05		25.89		25.88			34.05		
1	2	✓	✓	✓	✓	✓	✓	153.0	32.79	✓	26.03	✓	26.03	✓	✓	32.80	3	
1	3																	
1	4																	
1	5																	
1	6																	
1	7																	
3	1								51.37		43.21		43.21			51.34		
3	1	✓	✓	✓	✓	✓	✓	191.4	50.42	✓	43.35	✓	43.36	✓	✓	50.22	4	1430
3	2								51.30		43.21		43.21			51.28		
3	2	✓	✓	✓	✓	✓	✓	191.4	50.14	✓	43.35	✓	43.35	✓	✓	50.00	4	
3	3																	
3	4																	
3	5																	
3	6																	
3	7																	

5/26/10

Additional Comments: (pH, Turbidity, S.C., etc.)

Weather Sunny, 90's, slight NE breeze

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-23B
Sampling Zone No(s): 1,3,4,2

Date: 5/26/10
Start Time: 1330
End Time: 1545
Technicians: RH, JB

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
4	1								60.33		51.87		51.85			60.29		
4	1	✓	✓	✓	✓	✓	✓	211.1'	58.59	✓	52.00	✓	52.01	✓	✓	58.51	4	1500
4	2								60.25		51.87		51.87			60.24		
4	2	✓	✓	✓	✓	✓	✓	211.9'	58.45	✓	52.01	✓	52.01	✓	✓	58.40	4	
4	3																	
4	4																	
4	5																	
4	6																	
4	7																	
2									42.81		34.56		34.56			42.80		
2		✓	✓	✓	✓	✓	✓	171.7'	40.95	✓	34.71	✓	34.71	✓	✓	40.85	4	1530
2									42.78		34.53		34.55			42.77		
2		✓	✓	✓	✓	✓	✓	171.5	40.73	✓	34.71	✓	34.70	✓	✓	40.67	4	
2																		
2																		
2																		
2																		
2																		
2																		

Additional Comments: (pH, Turbidity, S.C., etc.)

Probe: 4071

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Date: 5/26/09
Start Time: 1615
End Time: 1650
Technicians: RH, JH

Project: Gainesville, FL
Monitoring Well No: FW-168
Sampling Zone No(s): 1, 2, 3, 4

Ambient: 14.42 (mp)

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
1	1								33.51		27.46		27.45			33.50		
1	1	✓	✓	✓	✓	✓	✓	165.2'	33.14	✓	27.84	✓	27.85	✓	✓	33.12	5	1630
1	2								33.01		27.47		27.46			33.00		
1	2	✓	✓	✓	✓	✓	✓	163.6'	33.01	✓	27.85	✓	27.85	✓	✓	33.95	5	
1	3																	
1	4																	
1	5																	
1	6																	
1	7																	

Additional Comments: (pH, Turbidity, S.C., etc.)

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-20B
Sampling Zone No(s): 2,1

Probe # 4071
Ambient: 14.45 psi

Date: 5/27/10
Start Time: 1040
End Time: 12 40
Technicians: RH, JB

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes Time
2	1								37.47		31.80		31.80			37.40	
2	1	✓	✓	✓	✓	✓	✓	176.4'	35.66	✓	32.14	✓	32.15	✓	✓	35.64	5 1200
2	2								36.89		31.80		31.80			36.89	
2	2	✓	✓	✓	✓	✓	✓	176.2'	35.57	✓	32.12	✓	32.12	✓	✓	35.45	5
2	3																
2	4																
2	5																
2	6																
2	7																
1	1								28.67		23.15		23.16			28.67	
1	1	✓	✓	✓	✓	✓	✓	156.5'	26.69	✓	23.49	✓	23.50	✓	✓	26.69	5 1230
1	2								28.15		23.15		23.15			28.16	
1	2	✓	✓	✓	✓	✓	✓	156.6'	26.65'	✓	23.49	✓	23.49	✓	✓	26.66	5
1	3																
1	4																
1	5																
1	6																
1	7																

Additional Comments: (pH, Turbidity, S.C., etc.)

Collected filterblank2-052710@1210

Westbay Instruments Inc.
A Schlumberger Company

Probe SN# 3535
Ambient 14.52 MP
Clear 75° (no wind)

Groundwater Sampling
Field Data Sheet

Date: 5/27/10
Start Time: 0856
End Time:
Technicians: GB/SD

Project: Gainesville, FL
Monitoring Well No: FW-12B
Sampling Zone No(s): 2,1,4,3

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out [ ] Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure [ ]	Open Valve	Zone Pressure ( ]	Close Valve	Shoe In	Pressure in MP ( )	Tubs / Time
2	1								33.52	GB 5/27/10	30.99		30.98			33.52	5 0852
2	1	✓	✓	✓	✓	✓	✓	175.6	32.99	✓	31.38	✓	31.38	✓	✓	32.97	5
2	2								33.00		30.99		30.99			32.99	
2	2	✓	✓	✓	✓	✓	✓	175.5	32.94	✓	31.40	✓	31.40	✓	✓	32.94	5 GB 5/27/10
2	3	✓	✓	✓	✓	✓	✓	175.5	31.48	✓	31.40	✓	31.40	✓	✓	31.47	2 GB 5/27/10
2	4																
2	5																
2	6																
2	7																
1	1								24.76		22.35		22.34			24.76	
1	1	✓	✓	✓	✓	✓	✓	155.7	24.18	✓	22.73	✓	22.72	✓	✓	24.18	5 0956
1	2								24.24		22.32		22.32			24.24	
1	2	✓	✓	✓	✓	✓	✓	155.8	24.16	✓	22.73	✓	22.73	✓	✓	24.16	5
1	3	✓	✓	✓	✓	✓	✓	155.5	22.42	✓	22.72	✓	22.73	✓	✓	22.42	2
1	4																
1	5																
1	6																
1	7																

5/27/10

Additional Comments: (pH, Turbidity, S.C., etc.)

Probe SN# 3535
Ambient 14.53 MP
Clear 80° (slight westbreeze)

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Date: 5/27/10
Start Time: 0950
End Time: 1220
Technicians: GB/SD

Project: Gainesville, FL
Monitoring Well No: FW-12B
Sampling Zone No(s): 2,1,4,3

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tube / Time
4	1								50.69		48.30		48.30			50.69	
4	1	✓	✓	✓	✓	✓	✓	215.7	49.98	✓	48.70	✓	48.70	✓	✓	49.98	5 1100
4	2								50.19		48.30		48.30			50.17	
4	2	✓	✓	✓	✓	✓	✓	215.5	49.95	✓	48.70	✓	48.70	✓	✓	49.97	5
4	3																
4	4																
4	5																
4	6																
4	7																
3	1								41.97		39.66		39.65			41.95	
3	1	✓	✓	✓	✓	✓	✓	195.6	41.24	✓	40.05	✓	40.04	✓	✓	41.22	5 1148
3	2								41.44		39.65		39.65			41.39	
3	2	✓	✓	✓	✓	✓	✓	195.6	41.19	✓	40.04	✓	40.05	✓	✓	41.20	5
3	3																
3	4																
3	5																
3	6																
3	7																

5/27/10

*Additional Comments: (pH, Turbidity, S.C., etc.)

collected EB-052710 @ 1210

Probe SN: 4071

Westbay Instruments Inc.
A Schlumberger Company

Ambient 14.45

85° clear (no wind)

Groundwater Sampling
Field Data Sheet

Date: 5/27/10
Start Time: 1405
End Time: 1930
Technicians: GB/JB/CC

Project: Gainesville, FL
Monitoring Well No: FW-30B
Sampling Zone No(s): 1,2,3,4

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tube	Time
1	1	✓	✓	✓	✓	✓	✓	160.8	31.63	✓	26.72	✓	27.71	✓	✓	31.63	5	1410
1	2	✓	✓	✓	✓	✓	✓	158.9	31.07	✓	25.94	✓	25.93	✓	✓	31.05	4	
1	3																	
1	4																	
1	5							5/27/10										
1	6																	
1	7																	
2	1	✓	✓	✓	✓	✓	✓	179.5	40.14	✓	35.38	✓	35.38	✓	✓	40.09	5	1435
2	2	✓	✓	✓	✓	✓	✓	179.4	40.05	✓	35.38	✓	35.38	✓	✓	39.97	5	
2	3	✓	✓	✓	✓	✓	✓	179.6	39.95	✓	35.37	✓	35.37	✓	✓	39.90	5	
2	4	✓	✓	✓	✓	✓	✓	179.6	39.08	✓	35.37	✓	35.37	✓	✓	38.99	2	
2	5																	
2	6																	
2	7																	

Additional Comments: (pH, Turbidity, S.C., etc.) Duplicate Collected ~~MW~~ FW 99-G-052710 2000 5/27/10

Probe SN: 4071

Ambient 14.36
Clear 85° (no wind)

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Date: 5/27/10
Start Time: 1405
End Time: 1638
Technicians: GB/JB/CC

Project: Gainesville, FL
Monitoring Well No: FW-30B
Sampling Zone No(s): 1,2,3,4

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
3	1	✓	✓	✓	✓	✓	✓	199.4	48.13	✓	44.04	✓	44.04	✓	✓	48.01	5	1535
3	2	✓	✓	✓	✓	✓	✓	199.6	47.45	✓	44.03	✓	44.03	✓	✓	47.41	4	
3	3																	
3	4																	
3	5																	
3	6																	
3	7																	
4	1	✓	✓	✓	✓	✓	✓	219.4	56.47	✓	52.69	✓	52.69	✓	✓	56.43	5	1605
4	2	✓	✓	✓	✓	✓	✓	219.3	56.00	✓	52.68	✓	52.68	✓	✓	55.92	4	
4	3																	
4	4																	
4	5																	
4	6																	
4	7																	

Additional Comments: (pH, Turbidity, S.C., etc.)

FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-20D

PERMIT NO.:

Project No.: OM-045010-091 Client: Beazer, Inc.

Project Name: 2nd Quarter GW Event Project Location: Gainesville FL

Weather Conditions: partly cloudy, light rain 85°F Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 37.14 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 84.25 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 47.11 (ft) (a-d)

h. Well Volume: 7.68 (gal)

2. WELL PURGE DATA

a. Purge Method: bladder pump #11484 w/dedicated teflon tubing

b. Field Testing Equipment: YSI 556 (OSMI500AD) Lamotte 2020 (5305-3804)

c. Required Total Purge Volume (1f x 2e) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 5.725 L (1.48 gal)

e. Begin Purge Time: 1444 End Purge Time: 1512

Conversion Factors (a x cf = b)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	1444	225	24.85	7.83	0.338	-107.4	7.67	1.64	37.31	clear
PURGING VALUES										
1	1448	200	24.12	6.44	0.334	-45.0	2.57	~~0.00~~ 5/25/10 0.39	37.36	clear
2	1454	200	23.68	6.41	0.331	-47.6	1.53	0.06	37.38	clear
3	1459	200	23.63	6.54	0.330	-54.6	1.36	0.02	37.38	clear
4	1504	200	23.54	6.71	0.328	-66.7	1.06	0.33	37.38	clear
5	1509	200	23.49	6.86	0.327	-76.6	1.02	0.39	37.38	clear
6	1512	200	23.47	6.80	0.326	-73.1	0.99	0.36	37.38	clear

[signature] 5/25/10

3. SAMPLE COLLECTION DATA Sampling Personnel: G Brenele / S Dippold

Sampling Method(s) & Equip: bladder pump w/ dedicated teflon line & varied tubing

Sample I.D. (Name, Date, Time): HG-20D-052510 5/25/10 1515

Sample Analytical Parameters/Method: BTEX SW846 8260B SVOC SW846 8270C

Sample Start Time: 1515 End Sample Time: 1540

COMMENTS:

WL 20334 machinery & trucks running while sampling

\\Pgh1\fts\Projects\Beazer Projects\Gainesville\ProjectManagement\ProjectDeliverableRpts\CGMSAP\15APR10_draft\Appendix A\02 Low Flow gw Sample Collection Record_May 2010.xls

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-205

PERMIT NO.:

Project No.: 0605010.091 Client: Beazer, Inc.

Project Name: 2010 2nd Qtr GW Event Project Location: Gainesville, FL

Weather Conditions: raining, ~80°F Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 7.14 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 39.83 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 32.69 (ft) (a-d)

h. Well Volume: 5.33 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic w/ ~10-41 ml Dedicated Tubing

b. Field Testing Equipment: YSI (10A/20/31) Turbidity 62016

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 0.95 (gal)

e. Begin Purge Time: 1405 End Purge Time: 1441

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
Init	1405	100	20.19	6.53	0.399	-44.4	3.49	1.78	7.14	
PURGING VALUES										
1	1410	100	19.90	6.53	0.447	-60.0	1.61	1.79	7.22	
2	1415	100	20.03	6.58	0.457	-65.8	1.32	1.74	7.33	
3	1420	100	20.07	6.51	0.439	-54.7	1.20	1.71	7.37	
4	1425	100	20.10	6.46	0.427	-49.2	1.18	1.70	7.45	
5	1430	100	20.01	6.18	0.339	-32.5	1.09	1.68	7.51	
6	1435	100	20.11	6.13	0.313	-26.1	1.04	1.67	7.52	
7	1438	100	20.13	6.12	0.313	-25.9	1.04	1.65	7.53	
8	1441	100	20.12	6.12	0.311	-25.6	1.04	1.64	7.54	

3. SAMPLE COLLECTION DATA Sampling Personnel: JB/RH

Sampling Method(s) & Equip: Peristaltic w/ Dedicated Teflon Lined Tubing

Sample I.D. (Name, Date, Time): HG-205-052510 5/25/10 1441

Sample Analytical Parameters/Method: 8270C, 8260B

Sample Start Time: 1441 End SampleTime: 1530

COMMENTS:

WO: 20246 ☆ Slowest possible purge ★ Also sampled HG-99D @ 2130

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG 21D

PERMIT NO.:

Project No.: OM 0450-10-091 Client: Beazer, Inc.

Project Name: Gainesville FL 2nd Qtr 2010 Project Location: Gainesville, FL

Weather Conditions: 85° clear Sampling Date: 5/26/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 37.96 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: ~~94.96~~ 94.96 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 57.00 (ft) (a-d)

h. Well Volume: 9.30 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Bladder Pump w/Teflon lined tubing (11484

b. Field Testing Equipment: YSI 556 (ox/dtw/600 AO) Lo Flow 2020 (5350-3804

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.85 vol

e. Begin Purge Time: 1430 End Purge Time: 1505

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
Init.	1430	150ml	25.96	7.52	0.350	-111.7	3.11	8.0	37.98	clear
PURGING VALUES										
1	1435	200ml	25.22	7.05	0.349	-98.6	1.19	13.0	37.98	clear
2	1440	200ml	25.12	7.06	0.347	-98.9	1.11	15.0	37.98	clear
3	1445	200ml	25.14	7.07	0.344	-97.3	1.01	15.0	37.98	clear
4	1450	200ml	25.45	7.27	0.348	-108.2	0.88	14.0	37.98	clear
5	1455	200ml	25.61	7.26	0.346	-109.2	0.89	12.0	37.98	clear
6	1500	200ml	25.60	7.25	0.345	-110.3	0.87	11.0	37.98	clear
7	1505	200ml	25.58	7.25	0.345	-112.8	0.88	11.0	37.98	clear

5/26/10

3. SAMPLE COLLECTION DATA Sampling Personnel: G. Beazer

Sampling Method(s) & Equip: Bladder Pump w/ teflon lined tubing

Sample I.D. (Name, Date, Time): HG 21D-052610 / 5/26/10 / 1510

Sample Analytical Parameters/Method: VOCs / SVOCs

Sample Start Time: 1510 End SampleTime: 1530

COMMENTS:

WL 20.32

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: MG-21S

PERMIT NO.:

Project No.: 00045-010-091 Client: Beazer, Inc.

Project Name: 2010 2nd Qtr. GW Event Project Location: Gainesville, FL

Weather Conditions: Sunny breezy ~85°F Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 9.63 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 41.18 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 31.55 (ft) (a-d)

h. Well Volume: 5.14 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic (Intake) w/ Dedicated Tubing

b. Field Testing Equipment: YSI (10B100136) Flow-Through Cell

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.03 (gal)

e. Begin Purge Time: 1140 End Purge Time: 1219

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
Pre	1140	100	20.36	7.77	0.270	-113.2	2.37	1.41	9.63	
PURGING VALUES										
1	1145	100	21.02	7.48	0.269	-116.5	1.95	1.52	10.49	
2	1150	100	21.54	7.42	0.268	-119.4	1.55	1.48	10.96	
3	1155	100	20.69	7.41	0.266	-124.5	1.30	1.45	10.98	
4	1200	100	20.58	7.40	0.265	-124.9	1.17	1.41	10.99	
5	1205	100	20.54	7.39	0.265	-125.5	1.05	1.39	11.00	
6	1210	100	20.31	7.39	0.265	-126.8	1.04	1.35	11.01	
7	1213	100	20.20	7.40	0.264	-127.8	1.03	1.28	11.01	
8	1216	100	20.20	7.40	0.265	-127.9	1.01	1.27	11.01	
9	1219	100	20.21	7.41	0.264	-128.2	1.00	1.25	11.02	

3. SAMPLE COLLECTION DATA Sampling Personnel: JB / RH

Sampling Method(s) & Equip: Peristaltic w/ Dedicated Teflon Lined Tubing

Sample I.D. (Name, Date, Time): MG-21S-052510 5/25/10 1219

Sample Analytical Parameters/Method: 8270C, 8260B

Sample Start Time: 1219 End SampleTime: 1252

COMMENTS:

WL: 20246 * slowest Possible Purge

FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-22D

PERMIT NO.:

Project No.: OM-045010-091 Client: Beazer, Inc.

Project Name: 2nd Quarter Project Location: Gainesville FL

Weather Conditions: partly cloudy 80°F Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 43.15 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 82.68 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 39.53 (ft) (a-d)

h. Well Volume: 6.44 (gal)

2. WELL PURGE DATA

a. Purge Method: bladder pump #11484 w/ teflon tubing (dedicated)

b. Field Testing Equipment: YSI 556 (05M1500 AD) Lamotte 2020 (5350-3804)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 4.1L (1.06 gal)

e. Begin Purge Time: 1039 End Purge Time: 1110

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	1039	200	24.63	8.65	0.269	-90.0	10.75	8.7	42.72	SD/KL ~~42.72~~ clear
PURGING VALUES										
1	1044	200	23.16	7.65	0.307	-85.2	4.56	12.0	43.01	clear
2	1049	100	23.15	7.40	0.306	-78.1	4.81	12.0	43.07	clear
3	1054	100	23.33	7.56	0.298	-75.5	4.99	11.0	43.13	clear
4	1059	100	23.55	7.61	0.294	-75.8	4.88	11.0	43.20	clear
5	1104	100	23.75	7.64	0.292	-74.6	4.88	11.0	43.27	clear
6	1107	100	23.79	7.63	0.292	-73.7	4.79	10.0	43.33	clear
7	1110	100	23.82	7.62	0.292	-72.6	4.72	9.9	43.40	clear

[signature] 5/25/10

3. SAMPLE COLLECTION DATA Sampling Personnel: G Brenk / SD [illegible]

Sampling Method(s) & Equip: bladder pump w/ dedicated teflon lined poned tubing

Sample I.D. (Name, Date, Time): HG-22D-052510 5/25/10 1115

Sample Analytical Parameters/Method: BTEX SW846 8260B SVOC SW846 8270C

Sample Start Time: 1115 End SampleTime: 1140

COMMENTS:

WL 20334 pumped at lowest sustainable flow, some clear-down

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FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-23D

PERMIT NO.:

Project No.: OM-045010-091 Client: Beazer, Inc.

Project Name: 2nd Quarter GW Event Project Location: Gainesville FL

Weather Conditions: pa Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 51.50 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 89.58 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 38.08 (ft) (a-d)

h. Well Volume: 6.21 (gal)

2. WELL PURGE DATA

a. Purge Method: bladder pump # 11484 w/ dedicated teflon tubing

b. Field Testing Equipment: YSI 556 (05M1500AD) Land Pro 2020 (8305-3804)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 5.725L (1.48gal)

e. Begin Purge Time: 1155 End Purge Time: 1223

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	1155	225	24.32	8.12	0.268	-66.2	12.63	2.6	51.62	clear
PURGING VALUES										
1	1200	200	23.65	7.53	0.266	-49.3	4.46	1.0	51.73	clear
2	1205	200	23.76	7.39	0.265	-51.3	2.67	2.4	51.75	clear
3	1210	200	23.83	7.52	0.265	-63.6	1.89	0.80	51.75	clear
4	1215	200	24.09	7.58	0.270	-87.3	1.51	0.57	51.75	clear
5	1220	200	24.11	7.60	0.272	-89.7	1.50	0.35	51.75	clear
6	1223	200	24.16	7.59	0.276	-95.3	1.48	1.0	51.75	clear

[signature] 5/25/10

3. SAMPLE COLLECTION DATA Sampling Personnel: OBrandt/SDipiel

Sampling Method(s) & Equip: bladder pump w/ dedicated teflon lines bonded tubing

Sample I.D. (Name, Date, Time): HG-23D-052510 5/25/10 1225

Sample Analytical Parameters/Method: BTEX SW846 8260B SVOC 8270C SW846

Sample Start Time: 1225 End SampleTime: 1250

COMMENTS:

WL 20334 took dup HG-99A-052510 at 2000

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LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-24S

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: 2010 2nd Qtr. GW Event Project Location: Gainesville, FL

Weather Conditions: Overcast ~80°F Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 13.73 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 71.67 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 57.94 (ft) (a-d)

h. Well Volume: 9.44 (gal)

2. WELL PURGE DATA

a. Purge Method: Peristaltic (1084) w/ Dedicated Tubing

b. Field Testing Equipment: YSI (10B100136) / La Motte (12026)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.72 (gal)

e. Begin Purge Time: 0800 End Purge Time: 0826

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
Int	0800	250	18.26	6.89	0.202	56.5	2.09	1.85	13.73	
PURGING VALUES										
1	0805	250	18.23	6.98	0.204	-44.9	1.89	1.67	13.79	
2	0810	250	18.25	7.06	0.204	-73.2	1.53	1.66	13.83	
3	0815	250	18.25	7.10	0.207	-86.7	1.30	1.64	13.84	
4	0820	250	18.28	7.15	0.208	-92.2	1.09	1.62	13.85	
5	0823	250	18.31	7.16	0.209	-93.3	1.06	1.63	13.85	
6	0826	250	18.32	7.16	0.209	-83.6	1.05	1.61	13.85	

3. SAMPLE COLLECTION DATA Sampling Personnel: JN

Sampling Method(s) & Equip: Peristaltic w/ Dedicated Teflon Lined Tubing

Sample I.D. (Name, Date, Time): HG-24S-052510 5/25/10 0826

Sample Analytical Parameters/Method: 8270C, 8260B

Sample Start Time: 0826 End SampleTime: 0840

COMMENTS:

LL: 20146

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FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-25D

PERMIT NO.:

Project No.: OH-045010-091 Client: Beazer, Inc.

Project Name: Gainesville 2nd Qtr Project Location: Gainesville FL

Weather Conditions: partly cloudy 80°F Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 50.84 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 86.04 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 35.20 (ft) (a-d)

h. Well Volume: 5.74 (gal)

2. WELL PURGE DATA

a. Purge Method: bladder pump #11484 w/dedicated teflon tubing

b. Field Testing Equipment: YSI 556 (DSM1500AD) Lamotte 2020 (5350-3804)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 3.35L (0.86 gal)

e. Begin Purge Time: 915 End Purge Time: 946

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	915	150	22.62	9.33	0.264	-26.9	5.14	8.3	50.82	clear
PURGING VALUES										
1	920	100	22.48	9.51	0.268	-27.7	3.64	8.6	51.15	clear
2	925	100	22.68	9.64	0.271	-45.9	3.05	6.4	51.07	clear
3	930	100	22.90	9.71	0.276	-58.0	2.84	6.2	51.05	clear
4	935	100	23.08	9.72	0.277	-67.1	2.45	5.8	51.05	clear
5	940	100	23.13	9.62	0.275	-72.7	2.21	5.7	51.05	clear
6	943	100	23.16	9.50	0.273	-75.8	2.16	5.3	51.05	clear
7	946	100	23.19	9.51	0.271	-78.1	2.13	5.5	51.05	clear

[signature] 5/25/10

3. SAMPLE COLLECTION DATA Sampling Personnel: GBzonek/SDippold

Sampling Method(s) & Equip: bladder pump w/dedicated teflon line handed tubing

Sample I.D. (Name, Date, Time): HG-25D-052510 5/25/10 950

Sample Analytical Parameters/Method: BTEX SW846 8260B, SVOC SW846 8270C

Sample Start Time: 950 End SampleTime: 1015

COMMENTS:

WL 20334 in street cars driving by on occassion, neighbor running chainsaw cutting down trees while sampling

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FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-26D

PERMIT NO.:

Project No.: OM-045010-091 Client: Beazer, Inc.

Project Name: ~~for~~ 2nd Quarter GW Event Project Location: Gainesville FL

Weather Conditions: Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 39.42 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 94.11 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 54.69 (ft) (a-d)

h. Well Volume: 8.91 (gal)

2. WELL PURGE DATA

a. Purge Method: bladder pump #11484 w/ dedicated teflon lined tubing

b. Field Testing Equipment: YSI 556 (05M1500AD) LaMotte 2020 (5305-3804)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 9.45 L (2.44 gal)

e. Begin Purge Time: 1552 End Purge Time: 1623

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	1552	330	25.78	8.07	0.258	-106.2	8.83	2.53	39.45	clear
PURGING VALUES										
1	1557	300	24.26	6.58	0.250	-64.3	1.30	0.63	39.50	clear
2	1602	300	24.09	6.60	0.249	-66.6	1.00	1.89	39.50	clear
3	1607	300	23.08	6.89	0.249	-87.0	0.77	2.55	39.50	clear
4	1612	300	23.90	7.08	0.250	-100.4	0.65	2.02	39.51	clear
5	1617	300	23.90	7.20	0.251	-107.3	0.59	1.75	39.51	clear
6	1620	300	23.91	7.21	0.251	-107.3	0.58	1.81	39.51	
7	1623	300	23.90	7.25	0.252	-105.1	0.56	1.79	39.51	

5/25/10

3. SAMPLE COLLECTION DATA Sampling Personnel: S Bzonk / S Dippold

Sampling Method(s) & Equip: bladder pump w/ dedicated teflon lined bladder tubing

Sample I.D. (Name, Date, Time): HG-26D-052510 5/25/10 1625

Sample Analytical Parameters/Method: BTEX SW846 8260B SVOC SW846 8270C

Sample Start Time: 1625 End SampleTime: 1640

COMMENTS:

WL 20334 collected EB-050810 at 1700

FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-26S

PERMIT NO.:

Project No.: OM-045010-091 Client: Beazer, Inc.

Project Name: 2nd Quarter GW Event Project Location: Gainesville FL

Weather Conditions: Sunny 80°F Sampling Date: 5/26/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 12.30 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 44.35 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 32.05 (ft) (a-d)

h. Well Volume: 5.22 (gal)

2. WELL PURGE DATA

a. Purge Method: peristaltic pump # L09002698 w/ lifter tubing

b. Field Testing Equipment: YSI 556 (10310 CBE) Lawtt 2020 (ME-12026)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 2.24L (0.56 gal)

e. Begin Purge Time: 955 End Purge Time: 1023

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	955	80	20.63	6.27	0.453	-81.7	8.01	6.17	13.18	clear
PURGING VALUES										
1	1000	80	21.02	6.29	0.457	-85.9	2.13	6.54	13.16	clear
2	1005	80	21.23	6.30	0.460	-88.1	1.88	6.29	13.18	clear
3	1010	80	20.85	6.30	0.463	-89.8	1.49	6.78	13.18	clear
4	1015	80	20.83	6.31	0.465	-91.5	1.28	5.37	13.18	clear
5	1020	80	20.85	6.30	0.465	-89.5	1.21	6.68	13.18	clear
6	1023	80	20.87	6.31	0.465	-92.0	1.16	7.16	13.18	clear

[signature] 5/26/10

3. SAMPLE COLLECTION DATA Sampling Personnel: S Dippolito

Sampling Method(s) & Equip: peristaltic pump w/ dedicated teflon lined tubing

Sample I.D. (Name, Date, Time): HG-26S-052610 5/26/10 1025

Sample Analytical Parameters/Method: BTEX VOC SW846 8260B SVOC SW846 8270C

Sample Start Time: 1025 End SampleTime: 1055

COMMENTS:

WL 20246 water level sustained at 80mL/m unable to pump any faster

FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-27D

PERMIT NO.:

Project No.: GM-045010-091 Client: Beazer, Inc.

Project Name: 2nd Quarter GW Event Project Location: Gainesville, FL

Weather Conditions: partly cloudy 85°F Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 31.91 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 96.39 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 64.48 (ft) (a-d)

h. Well Volume: 10.51 (gal)

2. WELL PURGE DATA

a. Purge Method: bladder pump #11484 w/ dedicated teflon tubing

b. Field Testing Equipment: YSI 556 (OSM1500AD) Lau Ac 2020 (S305-3804)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 5.725L (1.48 gal)

e. Begin Purge Time: 1320 End Purge Time: 1348

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	1320	225	26.71	8.43	0.235	-142.7	5.45	2.89	32.19	clear
PURGING VALUES										
1	1325	200	25.34	7.28	0.231	-103.5	2.17	4.12	32.26	clear
2	1330	200	24.99	7.22	0.231	-125.8	1.05	3.63	32.27	clear
3	1335	200	24.94	7.37	0.231	-148.8	0.71	3.20	32.28	clear
4	1340	200	24.52	7.46	0.239	-157.9	0.62	1.68	32.29	clear
5	1345	200	24.48	7.40	0.241	-151.8	0.58	0.98	32.30	clear
6	1348	200	24.54	7.50	0.246	-148.0	0.56	0.45	32.32	clear

[signature] 5/25/10

3. SAMPLE COLLECTION DATA Sampling Personnel: GBrunel/SDippold

Sampling Method(s) & Equip: bladder pump w/ dedicated teflon line bladder tubing

Sample I.D. (Name, Date, Time): HG-27D-052510 5/25/10 1350

Sample Analytical Parameters/Method: BTEX SW846 8260B SVOC SW846 8270C

Sample Start Time: 1350 End SampleTime: 1415

COMMENTS:

WL-20334

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LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-27S

PERMIT NO.:

Project No.: 0704501209-091 Client: Beazer, Inc.

Project Name: 2010 2nd Qtr GW Event Project Location: Gainesville, FL

Weather Conditions: Sunny, ~80°F Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 9.05 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 59.95 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 50.90 (ft) (a-d)

h. Well Volume: 8.30 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: Peristaltic (1084) w/ Dedicated Tubing

b. Field Testing Equipment: YSI (10B100136) / Lamotte (12016)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 0.72 (gal)

e. Begin Purge Time: 1015 End Purge Time: 1050

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	1015	100	22.03	7.88	0.215	8.7	3.84	7.07	9.05	
PURGING VALUES										
1	1020	100	21.91	7.90	0.210	0.1	2.38	1.86	9.15	
2	1025	100	~~7.46~~ 21.50	7.96	0.210	-9.3	2.09	1.84	9.21	
3	1030	100	21.81	8.03	0.210	-26.3	1.80	1.80	9.24	
4	1035	100	21.81	8.11	0.210	-51.2	1.45	1.78	9.24	
5	1040	100	21.81	8.20	0.210	-64.3	1.39	1.76	9.24	
6	1045	100	21.81	8.22	0.209	-67.8	1.37	1.75	9.24	
7	1050	100	21.82	8.23	0.209	-71.2	1.35	1.74	9.25	

3. SAMPLE COLLECTION DATA Sampling Personnel: JB/RH

Sampling Method(s) & Equip: Peristaltic w/ Dedicated Teflon lined Tubing

Sample I.D. (Name, Date, Time): HG-27S-052510 5/25/10 1050

Sample Analytical Parameters/Method: 8270C, 8260B

Sample Start Time: 1050 End SampleTime: 1115

COMMENTS:

WL: 20246

FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG 29D

PERMIT NO.:

Project No.: OM-045010-091 Client: Beazer, Inc.

Project Name: Gainesville, 2nd Qtr 2010 Project Location: Gainesville, FL

Weather Conditions: 85° clear Sampling Date: 5/26/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 40.67 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 96.28 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 55.61 ~~43.6~~ (ft) (a-d)

h. Well Volume: 9.06 (gal)

2. WELL PURGE DATA

a. Purge Method: Bladder Pump w/ teflon lined tubing

b. Field Testing Equipment: YSI 556 (OSMISOOHD) LaMotte 2020 (5350-3804)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.19 (gal)

e. Begin Purge Time: 1545 End Purge Time: 1615

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
Ini.	1545	150ml	24.93	6.61	2.342	-31.5	2.17	16.0	40.69	strong odor
PURGING VALUES										
1	1550	150ml	24.56	6.13	2.307	-53.4	1.77	18.0	40.69	strong odor
2	1555	150ml	24.35	6.22	2.267	-70.2	1.75	11.0	40.70	↓
3	1600	150ml	24.47	6.24	2.260	-74.3	1.73	10.27	40.70	↓
4	1605	150ml	~~24.81~~ 24.82	6.29	2.265	-78.1	1.70	9.89	40.70	↓
5	1610	150ml	24.81	6.29	2.240	-81.4	1.69	9.65	40.71	↓
6	1615	150ml	24.82	6.29	2.248	-83.5	1.68	9.66	40.71	↓

5/26/10

3. SAMPLE COLLECTION DATA Sampling Personnel: A. Bear

Sampling Method(s) & Equip: Bladder Pump w/ Teflon lined tubing

Sample I.D. (Name, Date, Time): HG 29D 5/26/10 1620

Sample Analytical Parameters/Method: VOCs / SVOCs

Sample Start Time: 1620 End SampleTime: 1635

COMMENTS:

WL 20334

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FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-29S

PERMIT NO.:

Project No.: OM-045010-091 Client: Beazer, Inc.

Project Name: 2nd Quarter GW Event Project Location: Gainesville FL

Weather Conditions: sunny 90°F Sampling Date: 5/26/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 12-11 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 54.10 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 41.99 (ft) (a-d)

h. Well Volume: 6.84 (gal)

2. WELL PURGE DATA

a. Purge Method: peristaltic pump #L09002698 w/ teflon tubing

b. Field Testing Equipment: YSI 556 (10B100136) LaMotte 2020e (ME-12026)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 2.24L (0.58 gal)

e. Begin Purge Time: 1421 End Purge Time: 1449

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	1421	80	21.61	5.26	6.003	-35.3	3.30	NA	12.94	odor yellow
PURGING VALUES										
1	1426	80	21.71	5.25	6.021	-38.1	2.03	NA	13.71	odor yellow
2	1431	80	22.33	5.24	6.038	-45.3	1.57	NA	14.27	odor yellow
3	1436	80	22.26	5.25	6.031	-48.2	3.72	NA	14.85	odor yellow
4	1441	80	22.98	5.26	6.028	-49.7	5.10	NA	15.38	odor yellow
5	1446	80	23.06	5.27	6.027	-50.6	5.22	NA	15.61	odor yellow
6	1449	80	23.07	5.28	6.048	-51.9	5.28	NA	15.97	odor yellow

[signature] 5/26/10

3. SAMPLE COLLECTION DATA Sampling Personnel: SDippolo

Sampling Method(s) & Equip: peristaltic pump w/ dedicated teflon tubing

Sample I.D. (Name, Date, Time): HG-29S-052610 5/26/10 1455

Sample Analytical Parameters/Method: VOC 8260B SVOC 8270C

Sample Start Time: 1455 End SampleTime: 1525

COMMENTS: Lamotte unable to read turbidity WL 20246 water changed from yellow to green to purple/black in purge bucket strong odor

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bubbles present in flow through cell, water yellow in pumped at lowest sustainable flow flow through

FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: M-12

PERMIT NO.:

Project No.: OM-045010-091 Client: Beazer, Inc.

Project Name: 2nd Quarter GW Event Project Location: Gainesville FL

Weather Conditions: sunny 90°F Sampling Date: 5/26/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 10.53 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 14.38 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 3.85 (ft) (a-d)

h. Well Volume: 0.63 (gal)

2. WELL PURGE DATA

a. Purge Method: peristaltic pump #209002698 w/ tiffan tubing

b. Field Testing Equipment: YSI 556 (10B100136) LaMotte

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 0.99 (gal)

e. Begin Purge Time: 1608 End Purge Time: 1633

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	1608	150	22.20	5.80	0.060	99.7	9.31	5.32	10.72	clear
PURGING VALUES										
1	1613	150	22.03	5.54	0.054	123.4	6.47	5.26	10.72	clear
2	1618	150	22.02	5.54	0.067	133.3	5.55	5.19	10.73	clear
3	1623	150	21.87	5.66	0.074	124.2	5.14	6.43	10.73	clear
4	1628	150	21.85	5.67	0.075	124.7	5.08	6.44	10.73	clear
5	1633	150	21.77	5.69	0.075	127.4	5.05	6.39	10.73	clear

[signature] 5/26/10

3. SAMPLE COLLECTION DATA Sampling Personnel: [signature]

Sampling Method(s) & Equip: peristaltic pump w/ dedicated tiffan lined tubing

Sample I.D. (Name, Date, Time): M-12-052610 5/26/10 1635

Sample Analytical Parameters/Method: VOC 8260B SVOC 8270C

total arsenic and chromium, dissolved arsenic & chromium

Sample Start Time: 1635 End SampleTime: 1710

COMMENTS: took dup M-99A at 2000 -052610 took filter blank - filter blank-01-052610 at 1600

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dust near well

took EB-052610 at 1540 took FB-052610 at 1550

FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: M-16A

PERMIT NO.:

Project No.: 0M-045010-091 Client: Beazer, Inc.

Project Name: Supplemental 2nd Quarter GW Event Project Location: Gainesville FL

Weather Conditions: Sunny 85°F Sampling Date: 5/26/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 10.18 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 15.43 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 5.25 (ft) (a-d)

h. Well Volume: 0.86 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: peristaltic pump #L0900216984 w/ Teflon tubing

b. Field Testing Equipment: YSI 556 (10B102036) Lamotte 2020e (ME-120226)

c. Required Total Purge Volume (1f x 2e) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 4.65L (1.2gal)

e. Begin Purge Time: 1233 End Purge Time: 1304

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	1233	150	19.32	6.66	0.201	-90.9	8.31	18.6	10.41	clear
PURGING VALUES										
1	1238	150	19.20	6.52	0.193	-87.2	2.46	15.3	10.41	clear
2	1243	150	18.99	6.41	0.177	-89.7	1.24	13.4	10.41	clear
3	1248	150	18.89	6.37	0.172	-84.5	0.91	12.8	10.41	clear
4	1253	150	18.67	6.36	0.176	-87.0	0.85	10.75	10.41	clear
5	1258	150	18.95	6.36	0.175	-86.2	0.81	10.95	10.41	clear
6	1301	150	18.99	6.39	0.176	-87.1	0.82	10.03	10.41	clear
7	1304	150	19.09	6.33	0.178	-87.1	0.82	9.59	10.41	clear

Scott Noll 5/26/10

3. SAMPLE COLLECTION DATA

Sampling Personnel: S Dippel

Sampling Method(s) & Equip: peristaltic pump w/ dedicated Teflon lined tubing

Sample I.D. (Name, Date, Time): M-16A-052610 5/26/10 1310

Sample Analytical Parameters/Method: VOC 8260B SVOC 8270C+PENTA, total arsenic, dissolved arsenic

Sample Start Time: 1310 End SampleTime: 1400

COMMENTS:

WL 20246 Note MS/MSD

FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: M-17

PERMIT NO.:

Project No.: OM 045 010-091 Client: Beazer, Inc.

Project Name: ~~Gw~~ 2010 2nd Qtr. GW Event Project Location: Gainesville, FL

Weather Conditions: overcast, ~85°F Sampling Date: 5/25/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 11.60 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 15.34 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 3.74 (ft) (a-d)

h. Well Volume: 0.61 (gal)

2. WELL PURGE DATA

a. Purge Method: Peristaltic (1084) w/ Dedicated Tubing

b. Field Testing Equipment: YSI (1017100136) / LaMotte (12020)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 1.32 (gal)

e. Begin Purge Time: 1550 End Purge Time: 1615

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
Int	1550	200	19.90	6.08	0.110	5.5	3.70	9.84	11.60	
PURGING VALUES										
1	1555	200	19.34	5.76	0.106	22.8	1.68	1.96	11.66	
2	1600	200	19.31	5.70	0.103	26.8	1.18	1.88	11.67	
3	1605	200	19.30	5.69	0.103	28.3	1.00	1.81	11.67	
4	1610	200	19.22	5.68	0.103	28.4	0.97	1.78	11.67	
5	1615	200	19.13	5.67	0.104	28.5	0.92	1.76	11.67	

JM 5/25/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JB/RH

Sampling Method(s) & Equip: Peristaltic w/ Dedicated Teflon Lined Tubing

Sample I.D. (Name, Date, Time): M-17-052510 5/25/10 1615

Sample Analytical Parameters/Method: 8270C, 8260D Total & Diss Metals

Sample Start Time: 1615 End SampleTime: 1632

COMMENTS:

WL: 20246 Collected FB-01-052510 @ 1645

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LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: M-33B

PERMIT NO.:

Project No.: OM-045010-091 Client: Beazer, Inc.

Project Name: 2nd Quarter GW Event Project Location: Gainesville FL

Weather Conditions: Sunny 75°F Sampling Date: 5/26/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 10.69 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 27.30 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 16.61 (ft) (a-d)

h. Well Volume: 2.71 (gal)

2. WELL PURGE DATA

a. Purge Method: peristaltic pump # L09002698 w/ teflon tubing

b. Field Testing Equipment: YSI 556 (10B102036) LaMotte 2020 (ME-12026)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 2.8L (0.72 gal)

e. Begin Purge Time: 839 End Purge Time: 907

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
INT	839	100	19.94	5.31	0.064	34.0	7.31	9.91	10.92	clear
PURGING VALUES										
1	844	100	19.92	5.16	0.061	24.1	1.85	10.51	10.92	clear
2	849	100	19.90	5.17	0.061	13.3	1.53	10.25	10.92	clear
3	854	100	19.87	5.19	0.062	8.5	1.29	9.07	10.92	clear
4	859	100	19.92	5.20	0.057	-2.7	0.84	8.62	10.92	clear
5	904	100	19.95	5.19	0.056	-8.5	0.84	8.71	10.92	clear
6	907	100	19.95	5.18	0.056	-12.5	0.86	9.84	10.92	clear

[signature] 5/26/10

3. SAMPLE COLLECTION DATA Sampling Personnel: S Dippolo

Sampling Method(s) & Equip: peristaltic pump w/ dedicated teflon lined tubing

Sample I.D. (Name, Date, Time): M-33B-052610 5/26/10 910

Sample Analytical Parameters/Method: SVOC SW846 8270C VOC SW846 8260B

Sample Start Time: 910 End SampleTime: 935

COMMENTS:

WL 20246

\\Pgh1\fls\Projects\Beazer Projects\Gainesville\ProjectManagement\ProjectDeliverableRpts\CGMSAP\15APR10_draft\Appendix A\02 Low Flow gw Sample Collection Record_May 2010.xls

Probe : 4071

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-16B
Sampling Zone No(s): 3,2,4

Date: 5/27/10
Start Time: 0810
End Time: 1030
Technicians: JB, RH

Ambient 14.44 psi

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Sand probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
3	1								51.68		44.79		44.78			51.54		
3	1	✓	✓	✓	✓	✓	✓	202.9	47.41	✓	45.10	✓	45.12	✓	✓	47.14*	5"	0930
3	2								50.98		44.78		44.78			50.86		
3	2	✓	✓	✓	✓	✓	✓	202.8	47.03	✓	45.10	✓	45.12	✓	✓	46.75*	5"	
3	3																	
3	4																	
3	5																	
3	6																	
3	7																	
2	1								43.21		36.13		36.12			43.10		
2	1	✓	✓	✓	✓	✓	✓	184.3	39.16	✓	36.46	✓	36.47	✓	✓	34.04	5"	0900
2	2								42.58		36.12		36.12			42.56		
2	2	✓	✓	✓	✓	✓	✓	183.1	39.01	✓	36.47	✓	36.47	✓	✓	38.83	5"	
2	3																	
2	4																	
2	5																	
2	6																	
2	7																	

Additional Comments: (pH, Turbidity, S.C., etc.)

Partly cloudy, 80°

* Pressure loss, checked/replaced seal

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-168
Sampling Zone No(s): 3,2,4

Date: 5/27/10
Start Time: 0810
End Time: 1030
Technicians: JB, RH

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes / Time
4	1								59.93		53.44		53.42			59.73	
4	1	✓	✓	✓	✓	✓	✓	222.7	55.35	✓	53.77	✓	53.76	✓	✓	55.35	5 / 1000
4	2								59.19		53.44		53.43			59.17	
4	2	✓	✓	✓	✓	✓	✓	222.8	55.29	✓	53.77	✓	53.77	✓	✓	55.28	5
4	3																
4	4																
4	5																
4	6																
4	7																

Additional Comments: (pH, Turbidity, S.C., etc.)

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-208
Sampling Zone No(s): 2,1

Probe # 4071
Ambient: 14.45

Date: 5/27/10
Start Time: 1050
End Time: 12 Hb
Technicians: RH, JB

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes Time
2	1								37.47		31.80		31.80			37.40	
2	1	✓	✓	✓	✓	✓	✓	176.4'	35.66	✓	32.14	✓	32.15	✓	✓	35.64	5 1200
2	2								36.89		31.80		31.80			36.89	
2	2	✓	✓	✓	✓	✓	✓	176.2'	35.57	✓	32.12	✓	32.12	✓	✓	35.45	5
2	3																
2	4																
2	5																
2	6																
2	7																
1	1								28.67		23.15		23.16			28.67	
1	1	✓	✓	✓	✓	✓	✓	156.5'	26.69	✓	23.49	✓	23.50	✓	✓	26.69	.5 1230
1	2								28.15		23.15		23.15			28.16	
1	2	✓	✓	✓	✓	✓	✓	156.6'	26.65'	✓	23.49	✓	23.49	✓	✓	26.66	5
1	3																
1	4																
1	5																
1	6																
1	7																

Additional Comments: (pH, Turbidity, S.C., etc.)

Collected filterblank 2-052710 @ 1210

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Probe : 4071

Date: 5/27
Start Time: 1050
End Time: 1240
Technicians: RH, JB

Project: Gainesville, FL
Monitoring Well No: FW-208
Sampling Zone No(s): 4,3

Ambient : 14.44

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
4	1								54.96		49.10		49.10			54.94		
4	1	✓	✓	✓	✓	✓	✓	218.0	54.33	✓	49.43	✓	49.43	✓	✓	54.30	5	1100
4	2								54.90		49.10		49.10			54.38		
4	2	✓	✓	✓	✓	✓	✓	216.2	53.34	✓	49.43	✓	49.43	✓	✓	53.14	4	
4	3																	
4	4																	
4	5																	
4	6																	
4	7																	
3	1								46.46		40.45		40.49			46.41		
3	1	✓	✓	✓	✓	✓	✓	196.4	44.59	✓	40.79	✓	40.79	✓	✓	44.13	5	1130
3	2								45.89		40.45		40.45			45.87		
3	2	✓	✓	✓	✓	✓	✓	196.4	43.98	✓	40.78	✓	40.79	✓	✓	43.90	4	
3	3																	
3	4																	
3	5																	
3	6																	
3	7																	

Additional Comments: (pH, Turbidity, S.C., etc.)

Sunny, 90's

Westbay Instruments Inc.
A Schlumberger Company

Probe SN# 3535
Ambient 14.52
Clear 75° (no wind)

Groundwater Sampling
Field Data Sheet

Date: 5/27/10
Start Time: 0850
End Time:
Technicians: GB/SD

Project: Gainesville, FL
Monitoring Well No: FW-128
Sampling Zone No(s): 2,1,4,3

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP [ ]	Shoe Out	Zone Pressure [ ]	Open Valve	Zone Pressure [ ]	Close Valve	Shoe In	Pressure in MP [ ]	Tubes / Time
2	1								33.52		30.99		30.98			33.52	5 0852
2	1	✓	✓	✓	✓	✓	✓	175.6	32.99	~~✓~~ 1756	31.98	✓	31.38	✓	✓	32.97	
2	2								33.00		30.99		30.99			32.99	
2	2	✓	✓	✓	✓	✓	✓	175.5	32.94	✓	31.40	✓	31.40	✓	✓	32.94	5 ~~0923~~
2	3	✓	✓	✓	✓	✓	✓	1755	31.48	✓	31.40	✓	31.40	✓	✓	31.47	2 ~~0930~~
2	4																
2	5																
2	6								5/27/10								
2	7																
1	1								24.76		22.35		22.34			24.76	
1	1	✓	✓	✓	✓	✓	✓	155.7	24.18	✓	22.23	✓	22.72	✓ ~~✓~~	✓	24.18	5 0955
1	2								24.24		22.32		22.32			24.24	
1	2	✓	✓	✓	✓	✓	✓	155.8	24.16	✓	22.73	✓	22.73	✓	✓	24.16	5
1	3	✓	✓	✓	✓	✓	✓	155.5	22.42	✓	22.72	✓	22.73	✓	✓	22.42	2
1	4																
1	5																
1	6							5/27/10									
1	7																

Additional Comments: (pH, Turbidity, S.C., etc.)

Probe SN# 3535
Ambient 14.53
Clear 80° (slight west breeze)

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Date: 5/27/10
Start Time: 0850
End Time: 1226
Technicians: GB/SD

Project: Gainesville, FL
Monitoring Well No: FW-12B
Sampling Zone No(s): 2,1,4,3

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port [ ] Arm out [ ] Land probe [ ]	Pressure in MP [ ]	Shoe Out	Zone Pressure [ ]	Open Valve	Zone Pressure [ ]	Close Valve	Shoe In	Pressure in MP [ ]	Tubes / Time
4	1								50.69		48.30		48.30			50.69	
4	1	✓	✓	✓	✓	✓	✓	215.9	49.98	✓	48.78	✓	48.70	✓	✓	49.98	5 1100
4	2								50.19		48.30		48.30			50.17	
4	2	✓	✓	✓	✓	✓	✓	215.5	49.95	✓	48.70	✓	48.70	✓	✓	49.97	5
4	3																
4	4																
4	5																
4	6																
4	7																
3	1								41.97		39.66		39.65			41.95	
3	1	✓	✓	✓	✓	✓	✓	195.6	41.24	✓	40.05	✓	40.04	✓	✓	41.22	5 1140
3	2								41.44		39.65		39.65			41.39	
3	2	✓	✓	✓	✓	✓	✓	195.6	41.19	✓	40.04	✓	40.05	✓	✓	41.20	5
3	3																
3	4																
3	5																
3	6																
3	7																

5/27/10

Additional Comments: (pH, Turbidity, S.C., etc.)

collected EB-052710 @ 1210

FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-12D

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: GAINESVILLE 2ND Q-2010 Project Location: GAINESVILLE, FL

Weather Conditions: SUNNY 87° Sampling Date: 5/27/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: N/A (ft) b Depth to Water: 45.04 (ft)

c. Depth to DNAPL: ~~FROM~~ N/A (ft) d Total Well Depth: 119.00 (ft)

e. LNAPL Thickness: (a-b) N/A (ft) f. DNAPL Thickness: (c-d) N/A (ft)

g. Length of Water Column: 73.96 (ft) (a-d)

h. Well Volume: 12.1 (gal)

2. WELL PURGE DATA

a. Purge Method: LOW FLOW / BLADDER PUMP (11484)

b. Field Testing Equipment: YSI 556, LAMOTTE 2020 (OSM1500AD 5053-3804)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 5,400 mL

e. Begin Purge Time: 1250 End Purge Time: 1340

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
1	6	200	29.64	10.14	.263	-113.1	4.90	75.2	44.85	CLOUDY
PURGING VALUES										
2	10	200	27.72	9.79	.220	-77.1	4.14	68.1	45.40	CLOUDY
3	15	100	27.90	9.27	.217	-55.1	2.96	60.4	45.71	CLOUDY
4	20	80	26.39	9.97	.226	-84.0	3.27	41.6	46.22	CLOUDY
5	25		25.88	10.88	.231	-107.7	3.02	23.8	46.70	CLEAR
6	30		25.46	10.41	.227	-113.9	2.82	15.9	46.84	
7	35		25.50	10.31	.230	-119.2	2.90	12.8	46.89	
8	40		25.38	10.28	.233	-117.0	2.80	11.0	46.93	
9	45	80	25.36	10.24	.233	-116.1	2.77	11.2	46.97	CLEAR
10	50	80	25.34	10.24	.233	-115.7	2.69	10.9	47.00	CLEAR

[illegible] 5/27/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JEFF LEAVER

Sampling Method(s) & Equip: BLADDER PUMP + TEFLON LINED TUBING

Sample I.D. (Name, Date, Time): HG-12D-052710, 5/27/10, 1340

Sample Analytical Parameters/Method: BTEX/8260B, SVOC'S/8270C, T+D As./6020

Sample Start Time: 1340 End SampleTime: 1440

COMMENTS:

\\Pgh1\fts\Projects\Beazer Projects\Gainesville\ProjectManagement\ProjectDeliverableRpts\CGMSAP\15APR10_draft\Appendix A\02 Low Flow gw Sample Collection Record_May 2010.xls

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: HG-16D

PERMIT NO.:

Project No.: OM04501O-0911 Client: Beazer, Inc.

Project Name: GAINESVILLE 2ND Q-2010 Project Location: GAINESVILLE, FL

Weather Conditions: SUNNY 88° Sampling Date: 5/27/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: N/A (ft) b Depth to Water: 45.40 (ft)

c. Depth to DNAPL: N/A (ft) d Total Well Depth: 117.25 (ft)

e. LNAPL Thickness: (a-b) N/A (ft) f. DNAPL Thickness: (c-d) N/A (ft)

g. Length of Water Column: 71.85 (ft) (a-d)

h. Well Volume: 11.7 (gal)

2. WELL PURGE DATA

a. Purge Method: LOW FLOW BLADDER PUMP (11484) (QSM 1500A0 SOS2-3884)

b. Field Testing Equipment: YSI 556, LAMOTTE 2020

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 9,000 mL

e. Begin Purge Time: 1500 End Purge Time: 1546

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
(2)	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
1	6	200	29.30	10.43	-.260	-122.2	2.99	22.8	45.57	CLOUDY
PURGING VALUES										
2	15	200	26.37	10.97	.361	-131.6	2.70	11.7	45.81	CLEAR
3	20	200	25.82	11.11	.388	-149.4	2.09	10.0	45.86	
4	25		26.25	10.85	.315	-151.0	1.36	7.9	45.90	
5	30		26.15	10.59	.297	-149.4	1.28	7.4	45.93	
6	35		25.55	10.21	.290	-147.0	1.17	6.1	45.95	
7	40		25.50	10.17	.287	-146.1	1.14	6.3	45.97	
8	45	↓	25.47	10.15	.285	-145.0	1.11	5.5	45.98	↓

3. SAMPLE COLLECTION DATA Sampling Personnel: JEFF LEAVER

Sampling Method(s) & Equip: BLADDER PUMP & TEFLON LINED TUBING

Sample I.D. (Name, Date, Time): HG-16D-052710 , 5/27/10 , 1550

Sample Analytical Parameters/Method: BTEX/8260B , SVOC's/8270C , TAL METALS/6020

Sample Start Time: 1550 End SampleTime: 1620

COMMENTS:

TTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: FW-6

PERMIT NO.:

Project No.: OM045010-091 Client: Beazer, Inc.

Project Name: GAINESVILLE 2ND Q-2010 Project Location: GAINESVILLE, FL

Weather Conditions: SUNNY 82° Sampling Date: 5/27/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: N/A (ft) b Depth to Water: NG (ft)

c. Depth to DNAPL: N/A (ft) d Total Well Depth: NG (ft)

e. LNAPL Thickness: (a-b) N/A (ft) f. DNAPL Thickness: (c-d) N/A (ft)

g. Length of Water Column: N/A (ft) (a-d)

h. Well Volume: N/A (gal)

2. WELL PURGE DATA

a. Purge Method: SYSTEM PUMPING WELL

b. Field Testing Equipment: YSI 556, LAMOTTE 2020 (05M500AD, 5058-3804)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: N/A

e. Begin Purge Time: 1040 End Purge Time: 1100

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
1	5	N/A	25.11	7.43	.403	-156.5	4.77	22.7	N/A	CLEAR
PURGING VALUES										
2	12	N/A	25.17	7.38	.407	-162.7	4.11	16.4	N/A	CLEAR

J.L. 5/27/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JEFF LEAVER

Sampling Method(s) & Equip: DEDICATED BLADDER PUMP + TUBING

Sample I.D. (Name, Date, Time): FW-6-052710, 5/27/10, 1100

Sample Analytical Parameters/Method: BTEX/8260B, SVOC'S/8270C, T+D AS/6020

Sample Start Time: 1100 End SampleTime: 1115

COMMENTS:

COULD NOT GAUGE WELL, PUMP + PIPING INSTALLED

FTS

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: FW-21B zone 01

PERMIT NO.:

Project No.: OM051010-091 Client: Beazer, Inc.

Project Name: Gainesville 2nd Qtr. 2010 Project Location: Gainesville, FL

Weather Conditions: Clear 80° Sampling Date: 5/27/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: NP (ft) b Depth to Water: 136.82 (ft)

c. Depth to DNAPL: NP (ft) d Total Well Depth: 188.81 (ft)

e. LNAPL Thickness: (a-b) NA (ft) f. DNAPL Thickness: (c-d) NA (ft)

g. Length of Water Column: 51.99 (ft) (a-d)

h. Well Volume: 33.9 (gal)

2. WELL PURGE DATA

a. Purge Method: Bladder Pump w/teflon lined tubing (11484)

b. Field Testing Equipment: YSI556 (OSMI500 AA) LaMotte 2020 (5053-3804)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: N

e. Begin Purge Time: 5/27/10 ~~0900~~ 1058 End Purge Time: 1149

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
1	15	200	26.21	7.91	.519	-39.0	6.90	12.7	136.69	136.69
PURGING VALUES										
2	20	200	26.79	7.79	.531	-176.4	2.82	11.4	136.74	CLEAR
3	25		27.81	7.86	.534	-251.2	1.28	19.3	136.75	
4	30		27.96	7.88	.537	-269.5	1.07	16.9	136.73	
5	35		28.02	7.88	.539	-258.2	1.01	20.0	136.77	
6	40		28.05	7.87	.541	-254.1	0.94	20.6	136.78	
7	45		28.08	7.87	.542	-253.0	0.89	20.1	136.75	
8	50		28.10	7.87	.542	-252.6	0.88	19.7	136.78	

5/27/10

3. SAMPLE COLLECTION DATA Sampling Personnel: JEFF LEAVER

Sampling Method(s) & Equip: Bladder Pump w/Teflon lined Tubing

Sample I.D. (Name, Date, Time): FW21B01-052710 5/27/10 1150

Sample Analytical Parameters/Method: VOCs/SVOCs/Total and Diss Metals

Sample Start Time: 1150 End SampleTime: 1220

COMMENTS:

WL 20334

\\Pgh1\fts\Projects\Beazer Projects\Gainesville\ProjectManagement\ProjectDeliverableRpts\CGMSAP\15APR10_draft\Appendix A\02 Low Flow gw Sample Collection Record_May 2010.xls

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: FW 21B Zone2

PERMIT NO.:

Project No.: 0MA45010-891 Client: Beazer, Inc.

Project Name: GAINESVILLE 2ND Q-2010 Project Location: GAINESVILLE, FL

Weather Conditions: SUNNY 77° Sampling Date: 5/27/10

1. WATER LEVEL DATA (measured from top of inner well casing)

a. Depth to LNAPL: N/A (ft) b Depth to Water: 136.82 (ft)

c. Depth to DNAPL: N/A (ft) d Total Well Depth: 188.81 (ft)

e. LNAPL Thickness: (a-b) N/A (ft) f. DNAPL Thickness: (c-d) N/A (ft)

g. Length of Water Column: 51.99 (ft) (a-d)

h. Well Volume: 33.9 (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
(4)	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: LOW FLOW / BLADDER PUMP (1484)

b. Field Testing Equipment: YSI 556 / LaMOTTE 2020 (OSM1500AP, SN:53-3884)

c. Required Total Purge Volume (1f x 2c) (gals.): NA

d. Total Volume and Number of Well Volumes Removed: 8,000 mL

e. Begin Purge Time: 0900 End Purge Time: 0940

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
1	10	200	26.67	7.96	.529	-120.3	4.71	14.7	136.80	CLEAR
PURGING VALUES										
2	15	200	26.94	7.84	.514	-135.7	5.92	11.2	136.84	CLEAR
3	20	"	27.05	7.82	.513	-144.9	5.27	18.0	136.84	"
4	25	"	27.14	7.79	.513	-149.1	4.90	19.3	136.83	"
5	30	"	27.37	7.77	.513	-156.7	4.26	18.8	136.86	"
6	35	"	27.40	7.76	.513	-157.9	4.22	16.7	136.84	"
7	40	↓	27.42	7.76	.513	-158.7	4.19	15.4	136.84	↓

3. SAMPLE COLLECTION DATA Sampling Personnel: JEFF LEAVELL

Sampling Method(s) & Equip: BLADDER PUMP + TEFLON LINED TUBING

Sample I.D. (Name, Date, Time): FW-21B-02-052710 5/27/10 0940

Sample Analytical Parameters/Method: BTEX/8260B, SVOC's/8270C, TAL As/6020

Sample Start Time: 0940 End SampleTime: 1040

COMMENTS:

TOOK DUP-01-052710 @ 0000 ~~LOST NOT GAUGE WATER LEVEL, PUMP PLUG ENCOUNTERED~~

Field & Technical Services, LLC
RCRA Facility Groundwater Monitoring Well Inspection Form

Site Name: Gainesville Site Phone: NA

Inspector Name: Rory Hanrahan/Greg Bisnek Audit Date: 5/24/10

KI Contact: NA KI Phone: NA Inspector Signature:

Well ID	Well Condition						
	Lock	Casing	Cap	Pad/Drainage	Vegetation/Accessibility	Potential Hazards	Comments
FW-25B	GC	GC FM	GC	GC	GC	None	none
ITW-12	GC	SU GC	GC	NA	GC	None	(in recycling plant)
FW-26C	GC	GC FM	GC	GC	GC	None	none
FW-4	GC	GC SU	GC	GC	GC	None	none
FW25C	GC	GC FM	GC	GC	GC	None	None
FW-26B	GC	GC FM	GC	GC	GC	None	None
FW29B	GC	GC FM	GC	GC	GC	Traffic	New well
FW29C	GC	GC FM	GC	GC	GC	Traffic	New well
M-09AR	GC	GC FM	GC	GC	GC	None	none
HG24S	GC	FM GC	GC	Wetland	GC	None	none
HG27S	NR	GC FM	GC	GC	GC	None	none

Field & Technical Services, LLC
RCRA Facility Groundwater Monitoring Well Inspection Form

Site Name: Gainesville

Well ID	Well Condition						
	Lock	Casing	Cap	Pad/Drainage	Vegetation/Accessibility	Potential Hazards	Comments
HG 25D	GC	GC FM	GC	GC	GC	Traffic	(missing bolt)
HG 22D	NL	GC FM	GC	GC	GC	None	(missing bolt)
HG 23D	GC	GC FM	GC	GC	GC	Traffic	(missing bolt)
ITW-22	GC	SO GC	GC	GC	Poor	Train Tracks	None
HG 27D	NR	GC FM	GC	GC	GC	GC 5/24/10 None	none
HG 30D	GC	FM GC	GC	GC	GC	None	(recycling plant)
HG 21S	GC	FM GC	GC	GC	GC	Traffic	none
HG 5D	GC	GC	GC	GC	GC	Fire Ants	None
HG 26D	GC	GC FM	GC	Cracked	GC	None	(missing bolts)

\\Pgh1\lls\Projects\Beazer Projects\Gainesville\ProjectManagement\ProjectDeliverableRpts\CGMSAP\15APR10_draft\Appendix A\06 Generic RCRA_Facility_GW_MonitWellInsp.doc

Field & Technical Services, LLC
RCRA Facility Groundwater Monitoring Well Inspection Form

Site Name: Gainesville

Well ID	Well Condition						
	Lock	Casing	Cap	Pad/Drainage	Vegetation/Accessibility	Potential Hazards	Comments
HG-6S	GC	GC	GC	GC	GC	None	
FW-21B	GC	GC	GC	GC	GC	None	
M-09BR	GC	GC	GC	GC	GC	None	
HG-20S	GC	FM	GC	GC	GC	none	
HG-2D	GC	GC	GC	GC	GC	Fire ants	
M-17	GC	GC	GC	GC	GC	None	
M-33B	GC	GC	GC	GC	GC	None	
M-20B	GC	GC	GC	GC	GC	None	
HG-21D	GC	FM	GC	GC	GC	Traffic	

Notes:
Summary:

Field & Technical Services, LLC
RCRA Facility Groundwater Monitoring Well Inspection Form

FTS

Site Name: Gainesville

Well ID	Well Condition						
	Lock	Casing	Cap	Pad/Drainage	Vegetation/Accessibility	Potential Hazards	Comments
HG-26S	GC	FM	GC	GC	GC	Fire Ants	needs 1 bolt
HG-4S	GC	GC	GC	GC	GC	Fire Ants	
HG-4D	GC	GC	GC	GC	GC	Fire Ants	
FW-1	NA	GC	NA	NA	GC	Fire Ants	Pumping well / locked in well house
M-23BR	GC	GC	GC	GC	GC	Fire Ants	
HG-6D	GC	GC	GC	GC	GC	Fire Ants	
M-16A	GC	GC	GC	GC	GC	Fire Ants	
M-16B	GC	GC	GC	GC	GC	Fire Ants	
M-25B	GC	GC	GC	GC	GC	Fire Ants	
HG-29D	NL	FM	GC	GC	GC	Fire Ants	
HG-29S	NL	FM	GC	GC	GC	Fire Ants	
M-12	GC	GC	GC	GC	GC	Fire Ants	

PRE-MARTUP / 2ND QTR

Westbay Instruments Inc.
A Schlumberger Company

Probe # 4071
Ambient # 14,59

Groundwater Sampling
Field Data Sheet

Date: 6/22/10
Start Time: 1400
End Time: 1700
Technicians: RH, CS

Project: Gainesville, FL
Monitoring Well No. FW-28B
Sampling Zone No(s): 2,3,4,1

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate pos ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
2	1	✓	✓	✓	✓	✓	✓	191.7'	45.50	✓	40.76	✓	40.76	✓	✓	45.50	5	
2	2	✓	✓	✓	✓	✓	✓	191.7'	45.47	✓	40.75	✓	40.75	✓	✓	45.47	5	1430
2	3																	
2	4																	
2	5																	
2	6																	
2	7																	
3	1	✓	✓	✓	✓	✓	✓	211.7'	54.11	✓	49.42	✓	49.42	✓	✓	54.08	5	
3	2	✓	✓	✓	✓	✓	✓	211.7	54.05	✓	49.42	✓	49.42	✓	✓	54.04	5	1510
3	3																	
3	4																	
3	5																	
3	6																	
3	7																	

Additional Comments: (pH, Turbidity, S.C., etc.)

Sunny 90's calm

PRE-STARTUP / 2ND QTR

Westbay Instruments Inc.
A Schlumberger Company

Project: Gainesville, FL
Monitoring Well No. FW-28B
Sampling Zone No(s): 2,3,4,1

Groundwater Sampling
Field Data Sheet

Date: 6/22/10
Start Time: 1400
End Time: 1700
Technicians: RH, CC

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	
4	1	✓	✓	✓	✓	✓	✓	231.7'	62.67	✓	58.07	✓	58.07	✓	✓	62.67	5
4	2	✓	✓	✓	✓	✓	✓	231.6'	62.65	✓	58.07	✓	58.07	✓	✓	62.67	5 1600
4	3																
4	4																
4	5																
4	6																
4	7																
1	✓	✓	✓	✓	✓	✓	✓	171.6'	36.92	✓	32.09	✓	32.09	✓	✓	36.91	5
1	2	✓	✓	✓	✓	✓	✓	171.8'	36.89	✓	32.09	✓	32.10	✓	✓	36.86	5 1645
1																	
1																	
1																	
1																	
1																	

PRE-STARTUP / 2ND QTR

Probe # 4071

Ambient : 14.56

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-24B
Sampling Zone No(s): 3,4,1,2

Date: 6/22/10
Start Time: 0930
End Time: 1100
Technicians: RH, CC

Zone No	Run No.	Surface Function Tests (probe in flushing collar) Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Position Sampler (Locate port [ ] Arm out [ ] Land probe [ ])	Sampling Collection Checks (probe located at sampling zone in MP casing) Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Comments (volume retrieved) Tubes	Time
3	1								52.61		44.02		44.01			52.59		
3	1	✓	✓	✓	✓	✓	✓	203.9'	48.13	✓	44.09	✓	44.09	✓	✓	48.12	5	
3	2								52.58		44.01		44.01			52.58		
3	2	✓	✓	✓	✓	✓	✓	203.8'	48.09	✓	44.09	✓	44.09	✓	✓	48.09	5	1000
3	3																	
3	4																	
3	5																	
3	6																	
3	7																	
4	1								61.04		52.66		52.67			61.04		
4	1	✓	✓	✓	✓	✓	✓	223.6'	56.74	✓	52.70	✓	52.72	✓	✓	56.74	5	
4	2								60.99		52.66		52.66			60.97		
4	2	✓	✓	✓	✓	✓	✓	223.5'	56.72	✓	52.70	✓	52.72	✓	✓	56.73	5	1050
4	3																	
4	4																	
4	5																	
4	6																	
4	7																	

Additional Comments (pH, Turbidity, S.C., etc.)

Sunny, Calm, 85°

PRE-STARTUP/2ND QTR

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-24B
Sampling Zone No(s): 3,4,1,2

Date: 6/22/10
Start Time: 0930
End Time: 1100
Technicians: RH, CC

Zone No.	Run No.	Surface Function Tests (probe in flushing collar): Shoe Out	Close valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Position Sampler: Locate port ( ) Arm out ( ) Land probe ( )	Sampling Collection Checks (probe located at sampling zone in MP casing): Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Comments (volume retrieved): Tubes	Time
1	1								34.88		26.79		26.78			34.87		
1	1	✓	✓	✓	✓	✓	✓	164.0'	30.65	✓	26.80	✓	26.80	✓	✓	30.66	5	
1	2								34.38		26.78		26.78			34.83		
1	2	✓	✓	✓	✓	✓	✓	164.2'	30.65	✓	26.80	✓	26.80	✓	✓	30.65	5	1130
1	3																	
1	4																	
1	5																	
1	6																	
1	7																	
2	1								43.78		35.38		35.38			43.77		
2	1	✓	✓	✓	✓	✓	✓	184.1'	39.30	✓	35.44	✓	35.45	✓	✓	39.28	5	1230
2	2								43.76		35.37		35.37			43.76		
2	2	✓	✓	✓	✓	✓	✓	184.0'	39.29	✓	35.44	✓	35.44	✓	✓	39.28	5	
2	3	✓	✓	✓	✓	✓	✓	184.0'	39.24	✓	35.44	✓	35.45	✓	✓	39.14	5	collected dup FW 99-2000
2	4	✓	✓	✓	✓	✓	✓	184.1'	38.92	✓	35.44	✓	35.45	✓	✓	38.93	5	
2	5																	
2	6																	
2	7																	

Additional Comments (pH, Turbidity, S C , etc)

* unexplained pressure drop

PRE-STARTUP / 2ND QTR

Probe # 41071

Ambient: 14.64

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Date: 6/23/10
Start Time: 1130
End Time: 1420
Technicians: RH, CC

Project: Gainesville, FL
Monitoring Well No: FW-22B
Sampling Zone No(s). 1,4,2,3

Zone No.	Run No	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Snap In	Pressure in MP ( )	Tubes	Time
1	1								27.83		23.11		23.10			27.83		1140
1	1	✓	✓	✓	✓	✓	✓	154.9'	35.43	✓	23.46	✓	23.45	✓	✓	35.43	5	
1	2								27.32		23.11		23.10			27.32		
1	2	✓	✓	✓	✓	✓	✓	156.0'	34.93	✓	23.46	✓	23.45	✓	✓	34.93	4	
1	3																	
1	4																	
1	5																	
1	6																	
1	7																	
4	1								51.64		46.89		46.89			51.60		
4	1	✓	✓	✓	✓	✓	✓	209.7	58.76	✓	47.34	✓	47.34	✓	✓	58.77	4	1220
4	2								51.14		46.89		46.89			51.14		
4	2	✓	✓	✓	✓	✓	✓	209.7	58.74	✓	47.33	✓	47.34	✓	✓	58.73	4	
4	3																	
4	4																	
4	5																	
4	6																	
4	7																	

6/23/10

6/23/10

Additional Comments: (pH, Turbidity, S.C., etc.)

PRE-START UP/ 2ND QTR

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No. FW-22B
Sampling Zone No(s): 1,4,2,3

Date: 6/23/10
Start Time: 1130
End Time: 1420
Technicians: RH, CC

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
2	1								36.40		31.76		31.76			36.40		
2	1	✓	✓	✓	✓	✓	✓	174.8'	43.51	✓	32.09	✓	32.10	✓	✓	43.51	4	1310
2	2								35.88		31.76		31.76			35.86		
2	2	✓	✓	✓	✓	✓	✓	174.8'	43.50	✓	32.10	✓	32.11	✓	✓	43.51	4	
2	3																	
2	4																	
2	5																	
2	6																	
2	7																	
3	1								45.02		40.41		40.41			44.99		
3	1	✓	✓	✓	✓	✓	✓	194.7'	52.63	✓	40.76	✓	40.77	✓	✓	52.65	5	1400
3	2								43.99		40.41		40.41			43.98		
3	2	✓	✓	✓	✓	✓	✓	194.7'	52.61	✓	40.76	✓	40.76	✓	✓	52.61	5	
3	3																	
3	3	✓	✓	✓	✓	✓	✓	194.8'	52.58	✓	40.76	✓	40.76	✓	✓	52.58	5	MS/MSD
3	4																	
3	4	✓	✓	✓	✓	✓	✓	194.7'	52.56	✓	40.76	✓	40.76	✓	✓	52.56	5	
3	5	✓	✓	✓	✓	✓	✓	194.8'	52.53	✓	40.75	✓	40.76	✓	✓	52.53	5	
3	6																	
3	7																	

Additional Comments (pH, Turbidity, S.C., etc.)

PLE-STARTUP / 2ND QTR

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-27B
Sampling Zone No(s). 1,2,3,4,5,6

Probe # 4071
Ambient: 14.62

Date: 6/23/10
Start Time: 1540
End Time: —
Technicians: RH, CC

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Location port ( ) Arm out ( ) Lend probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
1	1	√	√	√	√	√	√	152.7'	26.33	√	22.52	√	22.53	√	√	26.32	S	1610
1	2	√	√	√	√	√	√	152.8'	26.31	√	22.53	√	22.53	√	√	26.31	S	
1	3																	
1	4																	
1	5																	
1	6																	
1	7																	
2	1	√	√	√	√	√	√	177.6'	37.14	√	33.36	√	33.35	√	√	37.14	S	1700
2	2	√	√	√	√	√	√	177.8'	37.12	√	33.34	√	33.34	√	√	37.11	S	
2	3																	
2	4																	
2	5																	
2	6																	
2	7																	

Additional Comments: (pH, Turbidity, S C., etc.)

PRE STARTUP / 2ND QTR

Westbay Instruments Inc.
A Schlumberger Company

Probe # 4071

Ambient : 14.63

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No: FW-27B
Sampling Zone No(s): 1,2,3,4,5,6

Date: 6/24/10
Start Time: 0830
End Time: 1220
Technicians: RH, EE

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm port ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
3	1	✓	✓	✓	✓	✓	✓	202.7	47.94	✓	44.19	✓	44.19	✓	✓	47.95	5	0900
3	2	✓	✓	✓	✓	✓	✓	202.7	47.92	✓	44.19	✓	44.19	✓	✓	47.91	5	
3	3																	
3	4																	
3	5										6/24/10							
3	6																	
3	7																	
4	1	✓	✓	✓	✓	✓	✓	227.5	58.72	✓	54.99	✓	55.00	✓	✓	58.62	5	1000
4	2	✓	✓	✓	✓	✓	✓	227.7	58.57	✓	54.60	✓	54.99	✓	✓	58.50	5	
4	3																	
4	4										6/24/10							
4	5																	
4	6																	
4	7																	

Additional Comments: (pH, Turbidity, S.C., etc.)

STARTUP/2ND QTR

Westbay Instruments Inc.
A Schlumberger Company

Groundwater Sampling
Field Data Sheet

Project: Gainesville, FL
Monitoring Well No. FW-27B
Sampling Zone No(s): 1,2,3,4,5,6

Date: 6/24/10
Start Time: 0830
End Time: 1220
Technicians: RH, CC

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Anchor out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	Tubes	Time
5	1	✓	✓	✓	✓	✓	✓	252.5'	69.43	✓	65.81	✓	65.81	✓	✓	69.43	5	1030
5	2	✓	✓	✓	✓	✓	✓	252.7	69.41	✓	65.81	✓	65.81	✓	✓	69.40	5	
5	3	✓	✓	✓	✓	✓	✓	252.7'	69.35	✓	65.81	✓	65.81	✓	✓	69.34	5	
5	4	✓	✓	✓	✓	✓	✓	252.5'	69.31	✓	65.81	✓	65.81	✓	✓	69.29	5	
5	5																	
5	6																	
5	7																	
6	1	✓	✓	✓	✓	✓	✓	277.4'	80.09	✓	76.61	✓	76.61	✓	✓	80.08	5	1200
6	2	✓	✓	✓	✓	✓	✓	✓	80.04	✓	76.61	✓	76.61	✓	✓	80.04	5	
6	3																	
6	4																	
6	5																	
6	6																	
6	7																	

FW-99 Duplicate Zone

Additional Comments: (pH, Turbidity, S.C., etc.)

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(Provided to U.S. Environmental Protection Agency, Region IV)

APPENDIX D

COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLE ANALYSIS PLAN

(August 4, 2010
Revision No. 1 – October 18, 2010)

FTS Field & Technical Services
200 Third Avenue • Carnegie, PA 15106 • Phone: 412-429-2694 • Fax: 412-279-4512

October 18, 2010

Mr. Scott Miller, Remedial Project Manager
U.S. Environmental Protection Agency, Region IV
4WD-SRTMB
61 Forsyth Street S.W.
Atlanta, Georgia 30303-3104

RE: Comprehensive Groundwater Monitoring and Sample Analysis Plan Revision 01
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Dear Mr. Miller:

On behalf of Beazer East, Inc. (Beazer), Field & Technical Services, LLC (FTS) hereby provides U.S. Environmental Protection Agency (USEPA) Region 4 with this revised Comprehensive Groundwater Monitoring and Sample Analysis Plan (CGMSAP) for the above-referenced site. Monitoring wells HG-28S and HG-28D were previously scheduled to be installed by Beazer; however, 2009 sampling results from monitoring wells downgradient of the former Cabot Carbon Site lagoons indicated that impacts from these lagoons were present in the Surficial Aquifer and Hawthorn Group deposits. As a result, the USEPA requested that Cabot Carbon Corporation install monitoring wells HG-28S and HG-28D downgradient of their former lagoons. Given that wells HG-28S and HG-28D will be installed and controlled by Cabot, it is assumed that the wells will also be monitored by them. As a result, the following revisions have been made to the CGMSAP:

- Monitoring wells HG-28D and HG-28S have been removed from Tables 2-2, 5-2, 5-7 and Figure 2-2.

If you have any questions or need additional information regarding this submittal, please contact me at 412-429-2694 or Mitchell Brourman of Beazer at 412-208-8805.

Sincerely,

Field & Technical Services, LLC

Angela Gatchie

Angie Gatchie
Project Manager

cc: K. Helton – Florida Department of Environmental Protection
M. Brourman – Beazer East, Inc. (electronic)
J. Mousa, Ph.D. – Alachua County (electronic)
R. Hutton – Gainesville Regional Utilities (electronic)
G. Council – GeoTrans, Inc. (electronic)
J. Erickson – GeoTrans, Inc. (electronic)

Enclosures: CGMSAP

COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLE ANALYSIS PLAN

CABOT CARBON / KOPPERS SUPERFUND SITE GAINESVILLE, FLORIDA

Submitted to:
U.S. EPA Region 4

On behalf of:
Beazer East, Inc.

Prepared by:

Field & Technical Services, LLC

200 Third Avenue
Carnegie, Pennsylvania

and

GeoTrans, Inc.

363 Centennial Parkway
Louisville, Colorado

August 4, 2010
(Rev. No.: 01 – October 18, 2010)

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ABBREVIATIONS/ACRONYMS

ACEPD	Alachua County Environmental Protection Division
Beazer	Beazer East, Inc.
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CARP	Chemical Analytical Request Procedure
COC	Chain of Custody
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
DTB	Depth to Bottom
DTW	Depth to Water
EPA	Environmental Protection Agency
FDEP	Florida Department of Environmental Protection
FTS	Field & Technical Services, LLC
GeoTrans	GeoTrans, Inc.
HASP	Health and Safety Plan
HG	Hawthorn Group
IDW	Investigation-Derived Wastes
Koppers	Koppers Inc.
LCS	Laboratory Control Sample
LNAPL	Light Non-Aqueous Phase Liquid
CGMSAP	Comprehensive Groundwater Monitoring and Sample Analysis Plan
LTZ	Lower Transmissive Zone
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NAPL	Non-Aqueous Phase Liquid
ORP	Oxidation-Reduction Potential
PPE	Personal Protective Equipment
POTW	Publicly-Owned Treatment Works
QA	Quality Assurance
QC	Quality Control
RL	Reporting Limit
SAP	Sample Analysis Plan
SOP	Standard Operating Procedure
SU	Standard Units
SVOCs	Semi-volatile Organic Constituents
USEPA	United States Environmental Protection Agency
UTZ	Upper Transmissive Zone
VOCs	Volatile Organic Constituents
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

On behalf of Beazer East, Inc. (Beazer), Field & Technical Services, LLC (FTS) and GeoTrans, Inc. (GeoTrans) submit this Comprehensive Groundwater Monitoring and Sample Analysis Plan (CGMSAP). The purpose of the CGMSAP is to combine the current groundwater monitoring efforts into a unified Site-wide program thereby enhancing the efficiency of data collection and the quality of the data obtained for understanding Site-wide groundwater conditions. This approach also provides for reporting procedures that will present the Site-Wide monitoring data in a single unified report. This CGMSAP replaces the monitoring programs discussed in the following plans:

- The *Proposed Stage 2 Groundwater Monitoring Program, Initial Groundwater Remedial Action* (TRC, 1997) (Surficial Aquifer Monitoring Program);

- The *Floridan Aquifer Monitoring Plan, Cabot Carbon/Koppers Superfund Site, Gainesville, FL* (TRC, June 2004) and the *Addendum to the Floridan Aquifer Monitoring Plan* (GeoTrans, 2006) (Floridan Aquifer Monitoring Program); and,

- The *Supplemental Hawthorn Group Investigation and Monitoring Well Installation Workplan* (GeoTrans, 2007) (HG Aquifer Monitoring Program).

Brief descriptions of the current monitoring programs for the Surficial Aquifer, Hawthorn Group (HG) deposits, and Floridan Aquifer are presented in Section 1.1. The monitoring objectives and approach of this CGMSAP are presented in Section 2.1. The proposed monitoring locations, parameters, and frequency for the CGMSAP are presented in Sections 2.2 and 2.3.

1.1 BACKGROUND

This section describes the current monitoring programs in place at the Site for the Surficial Aquifer, HG deposits, and Floridan Aquifer. This CGMSAP presents a Site-wide monitoring approach that incorporates these efforts into a single, cohesive monitoring program and report.

1.1.1 Current Surficial Aquifer Monitoring Program

The groundwater extraction and treatment system was installed in late 1994 as part of the groundwater remedy selected in the 1990 *Record of Decision* (ROD) prepared by the United States Environmental Protection Agency (U.S. EPA), and in accordance with the *Initial Ground Water Remedial Action* prescribed by the Unilateral Administrative Order (UAO) issued to Beazer on March 29, 1991. The effectiveness of this system has been evaluated from January 1995 to the present date. The Phase I/Stage 1 monitoring program was initiated in January 1995 and consisted of the following elements:

- Monthly performance monitoring of flow rates, water levels, and dense, non-aqueous phase liquid (DNAPL) levels.

- Quarterly modeling and analytical calculations of well capture zones.

- Semiannual sampling and analysis of the extraction wells to provide baseline data for evaluating future changes in water quality. Samples were analyzed for semivolatile organic compounds (SVOCs), including pentachlorophenol; volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene, and xylenes (BTEX); and arsenic and chromium.

- Quarterly sampling and analysis of eight wells located within the alignment of the extraction system. These wells were selected to monitor the near-term effectiveness of the system. Samples were analyzed for SVOCs, BTEX, arsenic, and chromium.

- Quarterly monitoring of two offsite, downgradient wells and two onsite, upgradient wells. Samples were analyzed for SVOCs, BTEX, and arsenic and chromium.

In 1997, Beazer submitted the *Proposed Stage 2 Monitoring Program* (TRC, 1997). The Stage 2 monitoring program evaluated the data collected during the first 2 years of the Stage 1 and proposed modifications, reductions, and additions to the program based on the evaluation. The Stage 2 Program continues to be followed at this time and consists of the following elements:

- ***Groundwater Containment System Performance Monitoring*** – this consists of monthly recording of total and instantaneous flow rates for the 14 onsite extraction wells and quarterly fluid-level monitoring of 14 extraction wells and 71 onsite and offsite monitoring wells/piezometers; and,

- ***Groundwater Quality Monitoring*** – this consists of annual groundwater sample collection and analysis of the 14 extraction wells, two downgradient wells, and three offsite wells.

Current reporting requirements include semiannual reports that contain quarterly capture zone analyses, groundwater contour maps and tabulated water levels, extraction well flow totalizer readings, and DNAPL monitoring data. The results of the annual groundwater sampling and analysis are included in the second semiannual report provided each year.

This CGMSAP incorporates monitoring of the Surficial Aquifer in conjunction with remaining Site data with the goal of understanding Site-wide groundwater conditions. This document can be amended in the future to accommodate changes or modifications to the proposed program, or to accommodate the addition of other activities and/or objectives.

1.1.2 Current Hawthorn Group Deposit Monitoring Program

There is no specific current groundwater monitoring program established for HG deposits. Most recently, a comprehensive HG monitoring well sampling event was conducted in December 2007 in conjunction with the installation of 10 new off-Site HG monitoring wells. A total of 16 HG monitoring wells were sampled as part of the December 2007 sampling event. The results of this sampling event demonstrated that no groundwater impacts are present in the HG deposits to the west of the Site; however, there are some groundwater impacts in the HG deposits to the east of the Site. The majority of the groundwater impacts to the east of the Site are opposite the Former Process and Drip Track areas. The greatest impacts are in the Upper Hawthorn with lesser impacts in the Lower Hawthorn. This CGMSAP will provide a mechanism for evaluation of groundwater in the HG deposits as part of a routine comprehensive groundwater monitoring and reporting program.

1.1.3 Current Floridan Aquifer Monitoring Program

The Floridan Aquifer Monitoring Program is conducted as per the requirements of the *Floridan Aquifer Monitoring Plan* (TRC, June 2004). Additional Floridan Aquifer monitoring wells have been installed at the Site, since the June 2004 plan was approved. A summary of the monitoring wells included in the Floridan Aquifer Monitoring Program as of the date of this CGMSAP is presented in Table 1-1. Through the third quarter 2009, 73 Westbay sampling ports in 19 monitoring wells were sampled quarterly; two monitoring wells (FW-3 and FW-6) were sampled quarterly; and seven monitoring wells (FW-2, FW-4, FW-5, FW-7, FW-8, FW-9, and MWTP-MW1) were sampled on a semiannual frequency.

Reporting requirements include quarterly reports that summarize the field activities and the results of testing. They also include evaluations of data trends and variations, and temporal variations in groundwater flow direction in the Floridan Aquifer.

2.0 PROPOSED COMPREHENSIVE GROUNDWATER MONITORING PROGRAM

2.1 MONITORING PROGRAM OBJECTIVES

Surficial Aquifer

The primary (prior to remedial actions for the Surficial Aquifer, as determined by the feasibility study) objective of the Surficial Aquifer monitoring program is to ensure that the hydraulic-containment system is capturing impacted groundwater prior to flowing off Site. The principal direction for groundwater flow in the Surficial Aquifer is to the northeast. Therefore, monitoring for this aquifer will be concentrated along the eastern and northern Site property boundaries and in areas immediately downgradient of these boundaries. In addition, select wells will be monitored downgradient of the former Drip Track and former North Lagoon, which are located outside of proposed groundwater barrier wall remedy in the draft feasibility study.

Hawthorn Group Deposits

The primary (prior to remedial actions within the Hawthorn, as determined by the feasibility study) objective of the HG deposits monitoring program is to ensure the stability of groundwater impacts attributable to the Site within these deposits. The groundwater flow system for the HG deposits is separated into the Upper Hawthorn and Lower Hawthorn. The principal groundwater flow direction for the Upper Hawthorn is to the northeast. Therefore, groundwater monitoring for the Upper Hawthorn will be concentrated downgradient of the Site to the east and northeast.

The Lower Hawthorn contains two principal groundwater flow directions as a result of a groundwater divide that runs approximately north-south across the Site. This groundwater divide results in a principal groundwater flow direction to the northeast for the eastern half of the Site and a principal groundwater flow direction to the northwest for the western half of the Site. Therefore, groundwater monitoring for the Lower Hawthorn will be focused to the east, northeast, west, and northwest of the Site.

Floridan Aquifer

The primary (prior to remedial actions within the Floridan, as determined by the feasibility study currently being completed) objective of the Floridan Aquifer monitoring is to provide sufficient warning of potential Site constituent impacts to the Floridan Aquifer, such that appropriate remedial actions can be taken, if needed. Therefore, Floridan Aquifer monitoring will be performed on the Upper Transmissive Zone (UTZ) beneath the Site. In addition, monitoring will be performed in the Lower Transmissive Zone (LTZ) along the northern areas of the Site and immediately to the north of the Site to ensure that impacts are not present in deeper downgradient zones.

2.2 MONITORING PROGRAM

This CGMSAP provides for monitoring locations and frequencies appropriate to the program at the time of its writing. As described in Section 2.2.4, the specific details in Section 2.2.1, 2.2.2, and 2.2.3 may be revised by obtaining USEPA approval for revisions to the tables and figures included with this document.

2.2.1 Surficial Aquifer

The Surficial Aquifer existing hydraulic-containment system has been in operation since 1994. The original extraction wells for this system are located along the eastern and northern Site property boundaries hydraulically downgradient of potential source areas at the Site. The hydraulic-containment system has been modified to ensure a more efficient capture of impacted groundwater in closer proximity to the potential source areas. Horizontal wells were installed adjacent to the former source areas in April 2009 to provide both horizontal and vertical capture of impacted groundwater. The short-term performance monitoring for the improved containment system is discussed in the IRM workplan (GeoTrans 2008). The long-term comprehensive monitoring for the Surficial Aquifer system is discussed in this document and will focus on the overall effectiveness of the remedial measures at preventing migration of impacted groundwater to off-Site locations.

The CGMSAP for the Surficial Aquifer will consist of sampling wells in the immediate vicinity of the eastern and northern Site property boundaries, and downgradient of the former Drip Track and former North Lagoon (Figure 2-1). Wells selected for inclusion in the program are biased towards those with a history of higher observed constituent concentrations, and to provide sufficient spatial coverage. Initially, a total of 13 Surficial Aquifer wells will be used to monitor groundwater quality in the vicinity of these two property boundaries. The majority of the Surficial Aquifer monitoring wells are nested wells completed in the upper ("A" series monitoring wells) and lower ("B" series monitoring wells) portions of the Surficial Aquifer. In general, monitoring wells completed in the lower portion of the Surficial Aquifer contain higher constituent concentrations. Therefore, Surficial Aquifer monitoring will primarily be performed in monitoring wells completed in the lower portion of the aquifer ("B" series monitoring wells). The list of wells included in the Surficial Aquifer monitoring is included in Table 2-1.

The list of constituents will be tailored to known constituent distributions established from the Stage 1 and Stage 2 monitoring programs, as well as the comprehensive Surficial Aquifer sampling performed in August 2007. All Surficial Aquifer monitoring wells will be sampled for a select list of semi-volatile organic constituents (SVOCs) and a select list of volatile organic constituents (VOCs) presented in Section 5. In addition, select wells will be sampled for arsenic, chromium and pentachlorophenol. Arsenic impacts have historically been observed in extraction and monitoring wells in the southern half of the Site and in one monitoring well in the northeastern corner of the Site. Therefore, CGMSAP monitoring wells located in these areas

will be analyzed for arsenic. Pentachlorophenol has only been detected in monitoring wells located in the southern half of the Site. Therefore, monitoring wells within and downgradient of the pentachlorophenol-impacted areas will be analyzed for pentachlorophenol. Chromium impacts are not wide-spread in groundwater beneath the Site, as per the *Surficial Aquifer Well Redevelopment and Sampling Report, In Response to 5-Year Review Report, April 2006 – Recommendation #9, Cabot Carbon/Koppers Superfund Site in Gainesville Florida* (December 2007). Therefore, it is recommended that analysis for chromium be removed from the original analytical suite for the majority of the monitoring wells. Evidence supporting the removal of chromium is based on its relative immobility and historical data showing that chromium has only been detected in two Surficial Aquifer wells above the GTCL. Wells to be monitored for chromium, arsenic and pentachlorophenol under this program are listed in Table 2-1.

2.2.2 Hawthorn Group Deposits

The HG monitoring will primarily focus on ensuring that groundwater impacts remain on Site and that off-Site impacts to groundwater are stable and/or attenuating. As such, the HG monitoring will concentrate on wells located along the eastern and western property boundaries and downgradient of these boundaries.

Monitoring wells will be sampled along the eastern property boundary, along the western property boundary, interior to the property, and downgradient of the source areas (Figure 2-2). Monitoring along the eastern property boundary will be performed in nested Upper and Lower Hawthorn wells and monitoring along the western property boundary will primarily be performed in Lower Hawthorn monitoring wells. One exception along the western property boundary is monitoring well HG-24S, which was completed in the Upper Hawthorn and will continue to be monitored under this program.

The list of analytes for the HG monitoring wells is tailored to the known constituent distributions established from the comprehensive sampling performed in December 2007. All HG monitoring wells will be sampled for select SVOCs and VOCs presented in Section 5. HG monitoring well sampling locations and frequencies are provided in Table 2-2.

2.2.3 Floridan Aquifer

Existing Floridan Aquifer monitoring wells in the vicinity of the Site are completed in the UTZ and LTZ. The UTZ wells consist of both standard-construction monitoring wells and multiple-screen, multi-port sampling wells. The single-screen UTZ wells (FW-1 through FW-9) were the first monitoring wells installed to characterize the Floridan Aquifer at the Site. Since the installation of the single-screen wells, additional multiple-screened and multi-port wells have been installed to provide vertically discrete sampling intervals within the Floridan Aquifer. In general the multi-port wells provide data that overlaps with that from the single-screened wells.

Therefore, the majority of the single-screen UTZ wells will not be included in the CGMSAP. Single-screened monitoring wells included in the CGMSAP program are listed in Table 2-3.

Floridan Aquifer monitoring will provide early detection of Site-constituent impacts downgradient of potential source areas, in the event that remedial measures are needed to address impacts to the Floridan Aquifer. Present constituent impacts are currently restricted to localized on-Site areas and do not appear to be wide-spread beneath the Site. In addition, the source of these impacts is still being evaluated to determine if they are a result of short-circuiting via existing Site wells.

The Floridan Aquifer monitoring will concentrate on wells located in the northern half of the Site and in suspected source area locations. Initially, a total of 31 Floridan monitoring wells will be included in the CGMSAP (Figure 2-3). A total of ten Floridan Aquifer monitoring wells will be sampled from what has been designated the transect wells. These wells form an open ended rectangular box on the northern half of the Site that encompass the western, eastern, and approximately northern Site property boundaries. A total of five Floridan Aquifer monitoring wells will be sampled from what has been designated the former source areas. A total of ten Floridan Aquifer monitoring wells will be sampled from what has been designated the property boundary and a total of six off-Site wells will be sampled, which are designated sentinel wells.

The majority of the wells proposed for the Floridan Aquifer monitoring contain multiple ports. The on-Site UTZ monitoring wells contain four separate ports and the LTZ wells contain three ports. Initially, groundwater samples will be collected from all ports. The list of analytes for the Floridan Aquifer monitoring wells is tailored to the known constituent distributions established from the quarterly sampling in these wells, which has been on-going since 2006. All Floridan Aquifer monitoring wells will be sampled for select SVOCs and BTEX as indicated in Section 5. In addition, the sentinel wells will be monitored for arsenic for four (4) quarterly events until it is either confirmed by two successive sampling events that arsenic is not detected at a particular monitoring location or it is confirmed by four successive sampling events that the arsenic concentration, where present, consistently does not exceed the 10 µg/l Maximum Concentration Limit (MCL). The remaining Floridan wells and specific ports to be sampled for arsenic are listed in Table 2-3. All monitoring wells and sampling frequency for the Floridan Aquifers are provided in Table 2-3.

2.3 MONITORING FREQUENCIES UNDER THE COMPREHENSIVE PROGRAM

The proposed CGMSAP will maintain flexibility in the locations and numbers of monitoring wells, in addition to the sampling frequency of individual wells and monitoring ports. As conditions warrant, wells can be added and/or removed to adjust to changes to the conceptual model and plume dynamics. Current monitoring frequencies for all monitoring wells are provided in Table 2-1 (Surficial wells), Table 2-2 (HG wells), and Table 2-3 (Floridan wells)

There are sufficient historical data from the Surficial Aquifer wells to conclude that the concentrations of the chemicals of interest are relatively stable. As such, the initial sampling frequency for nine of the thirteen Surficial Aquifer wells is proposed to be semiannual for the first four sampling events under this plan (Table 2-1). Two of the monitoring locations will be sampled quarterly for 1 year. If stability in concentration is observed, the frequency will be reduced to semiannual. Surficial Aquifer well ITW-12 has been monitored annually since 1997 to the present date and annual monitoring will continue. Table 2-1 presents the monitoring frequency for these and the remaining Surficial aquifer well locations.

The 16 new HG monitoring well locations, listed in Table 2-2, will initially be sampled quarterly for a minimum of four sampling events. If stability in concentration is observed, the frequency will be reduced to semiannually for 1 year, and annually thereafter. Existing HG monitoring wells with sufficient historical sampling data, will be sampled at an annual sampling frequency. Table 2-2 presents the monitoring frequency for HG wells.

Sampling frequency for Floridan Aquifer wells with four or more quarters of groundwater monitoring data wells will generally be annual. The exception to annual sampling for this group of wells will be semiannual sampling of select ports in wells with historically elevated constituent concentrations (Table 2-3). Semiannual sampling will continue for these select ports until temporal trend analysis supports a longer sampling period. Initial sampling frequency for recently installed wells will be quarterly for the first year (Table 2-3). If stability in concentration is observed, the frequency will be reduced to semiannually for 1 year, and annually thereafter. In general, the sampling frequency and number of ports sampled will be evaluated on an annual basis and adjusted, if needed. Table 2-3 presents the sampling frequency for Floridan Aquifer monitoring wells.

2.4 FUTURE MODIFICATIONS TO MONITORING PROGRAM

Modifications to the CGMSAP will be accomplished by proposing the modifications in a letter to the regulatory agencies (see Section 8.0) with appropriate technical justifications for the proposed change. Modifications to the wells and sampling frequency will be reflected in Tables 2-1 through 2-3 and Figures 2-1 through 2-3. The revised tables will be appended to the original sampling plan to reflect modifications to the program. A revision number and date will be incorporated into the header of the revised tables and figures to reflect the most recent modification. In addition, a new report cover page with the appropriate revision number and date will replace the previous report cover page.

For any well sampled at an annual frequency, the monitoring frequency will be increased to semiannual where either the concentration of a contaminant increases from below a groundwater clean-up target level (GCTL) to above a GCTL, or where successive annual samples show an increasing concentration of any contaminant, regardless of the specific concentrations observed.

3.0 MOBILIZATION ACTIVITIES

This section summarizes the preparatory tasks that must be performed prior to initiation of a groundwater monitoring event.

3.1 NOTIFICATIONS

Alachua County – At a minimum of 2 weeks prior to mobilization to the Site to perform a monitoring event, notice must be sent to Alachua County advising them of the sampling dates. Notice is sent via telephone or electronic mail to the Environmental Program Manager of the Alachua County Environmental Protection Department.

Laboratory – The laboratory Project Manager must be contacted via telephone or electronic mail and a Chemical Analytical Request Procedure (CARP) Form must be completed and submitted to the analytical laboratory (or laboratories) at least two weeks prior to the planned sampling event. This will allow for timely completion of the sample bottle order and shipping/delivery.

3.2 FIELD PROJECT PERSONNEL AND RESPONSIBILITY

Field project personnel identified in this CGMSAP have the responsibilities defined in this section. Laboratory project personnel and their associated responsibilities are defined in the *Quality Assurance Project Plan for the Comprehensive Groundwater Monitoring Plan at Cabot Carbon/Koppers Superfund Site Gainesville, Florida* found in Appendix C.

Project Manager – The Project Manager will be the primary point of contact and will have the primary responsibility for technical, financial and scheduling matters for this investigation. Duties will include:

- Procurement, along with administrative personnel, and supervision of subcontractor services including review of subcontract work and approval of subcontract invoices.
- Assignment of duties to the project staff and orientation of the staff of the needs and requirements of the project as they relate to the project objectives.
- Establishment of a project recordkeeping system.
- Review of all major project deliverables for technical accuracy and completeness
- Project closeout.
- Responsibility for the project evidence file.

Field Team Leader – The Field Team Leader will be responsible for field activities and data evaluation, including items as follows:

- Supervising the collection of the samples and providing for their proper documentation, handling and shipment.
- Coordinating field-related activities with the Project Manager.
- Preparing and reporting the field investigation data for evaluation procedures.

Site Health and Safety Officer – The Site Health and Safety Officer (SHSO) will be responsible for verifying that project personnel adhere to the site safety requirements. These responsibilities include:

- Conducting the health and safety training for project personnel and subcontractors, as per the Site-specific Health and Safety Plan (HASP; Key Environmental, current revision).
- Modifying health and safety equipment or procedure requirements based on data gathered during the site work.
- Observing work party members for symptoms of exposure or stress.
- Providing first aid if necessary onsite.
- Performing site audits to verify adherence to the requirements of the Site-specific HASP.

3.3 PRE-JOB PLANNING ACTIVITIES

Pre-Sampling Briefing – The Field Team Leader, field team members, and subcontractors, as applicable, are to participate in a pre-sampling briefing meeting coordinated and conducted by the FTS Groundwater Sampling Supervisor prior to deploying to the Site. The purpose of the meeting is to review the scope of work, identifying any out-of-scope activities that may be required during the current event, verifying the travel schedule, confirming that the proper equipment has been assembled or ordered for shipment to the Site, and confirming delivery of the proper and complete bottle order from the lab. Also during this meeting, the gauging and sampling order is reviewed and confirmed to reflect that the "clean-to-dirty" order has been properly determined, that all required Site-specific notifications and training are complete, relevant Site-control documents such as the CGMSAP, Site-specific HASP, and Scope of Work have been reviewed by all sampling personnel. The Groundwater Sample Collection Forms from the previous sampling event are also reviewed. Proper management of investigative-derived waste and Site-specific waste labeling requirements are reviewed. Proper labels are supplied to the Field Team Leader by the FTS Project Manager or Groundwater Sampling Supervisor. All those attending the meeting sign and date the Pre-Sampling Briefing Form. All personnel performing on-site activities are required to obtain 40-hour HAZWOPER training and annual 8 hour refresher training.

CGMSAP Review - All field personnel must review this CGMSAP prior to mobilization to ensure that they are thoroughly familiar with the scope of the activities and the procedures to be employed. The Field Team Leader is responsible for ensuring that field personnel review the CGMSAP.

HASP Review - All field personnel must review the HASP prior to mobilization to ensure that they are thoroughly familiar with potential hazards, levels of personal protection, emergency numbers, relevant routes, etc. The Field Team Leader is responsible for ensuring that all field personnel review the HASP.

Field Activity Forms– All field personnel must review the Field Activity Forms generated as a result of the previous monitoring event. This will familiarize the field personnel with potential problems, potential corrective actions, required verification of any previous action items, etc. The Field Team Leader is responsible for ensuring that all field personnel review the previous Groundwater Sample Collection Forms.

3.4 CONTAINERS, EQUIPMENT, AND DOCUMENTATION

Sample Containers - The analytical laboratory will identify appropriate sample containers (including appropriate preservatives) and prepare a sample container list. A comprehensive list of bottleware and analytical requirements can be found in Table 3-1. The laboratory will also ship or deliver the sample containers, shipping containers, sample labels, custody seals, and chain-of-custody forms to the sampling contractor at least one week prior to the sampling event. The CARP Form will be used by the laboratory to develop the sample container list and prepare the bottle order. An example CARP Form can be found in Appendix A.

Sampling Equipment – Table 3-2 is a checklist of supplies and sampling equipment required for the monitoring events. The sampling contractor will assemble the required supplies which consist of planning documents, monitoring equipment, sampling equipment, documentation supplies, health and safety equipment, sample packaging and shipping supplies, and miscellaneous equipment. The Field Team Leader is be responsible for ensuring that all equipment listed in Table 3-2 is available on Site prior to initiation of the monitoring event.

Monitoring Documentation - The Field Team Leader will be responsible for ensuring that Field Logbooks and all forms are made available during the groundwater monitoring event. All documentation will be archived by FTS for a minimum of three years. Required forms are provided in Appendix A, and consist of the following:

- Pre-Sampling Briefing Form
- Groundwater Sample Collection Record
- Westbay Groundwater Sampling Field Data Sheet
- Groundwater Gauging Sheet
- Groundwater Monitoring Well Inspection Form
- Equipment Calibration Form
- Investigation-Derived Waste Inventory Log
- Chain-of-Custody Form
- Chemistry Analytical Request Procedure (CARP) Form

4.0 QUALITY CONTROL SAMPLES

Various types of Quality Assurance/Quality Control (QA/QC) samples will be collected and/or analyzed in support of the groundwater monitoring program. These samples will be contingent upon the specific analytical methods to be employed and will likely consist of trip blank samples, field duplicate samples, field blank samples, equipment rinsate blank samples, matrix spike/matrix spike duplicate samples, and filter blank samples. Note that dedicated sampling equipment will be employed. Hence, rinsate blank samples likely will not be generated or analyzed for the monitoring program. Table 4-1 summarizes the type and frequency of field QA/QC samples required for this project.

4.1 TRIP-BLANK SAMPLES

Trip-blank samples will be analyzed when samples are collected for VOCs analysis. The primary purpose of the trip-blank samples is to detect any potential additional non-Site-related contamination that is introduced in the samples during shipping and analysis. Trip blanks serve as a mechanism of control for sample bottle preparation, blank water quality, and laboratory sample handling conditions. The following constitute potential sources of trip-blank contamination.

- Sample container contamination;
- Cross-contamination during shipment;
- Laboratory reagent water;
- Ambient conditions in the laboratory (background air); and,
- Laboratory reagents used in analytical procedures.

Each time a group of bottles is prepared for use in the field, the laboratory will prepare the appropriate numbers of trip-blank samples. Bottles will be selected from the batch and filled with analyte-free water. This water must originate from a single source and physical location within the laboratory. Trip-blank samples will be handled, transported, and analyzed in the same manner as the field samples. Each Trip Blank will be assigned a unique identification beginning with TB (e.g. TB-01, TB-02, etc.). Trip blanks will be submitted at a rate of one per twenty samples or per day of sampling for BTEX analysis. The trip-blank sample bottles themselves will not be opened in the field.

4.2 FIELD DUPLICATE SAMPLES

Duplicates of environmental samples will be collected and analyzed at a frequency of one per every ten samples or one per sample shipment, whichever is greater. Duplicate samples of groundwater are obtained by alternately filling sample containers from the same sampling device by one third increments per parameter, with the exception of VOCs. For VOCs, entire sample containers will be sequentially filled between investigative and field duplicate samples.

Duplicate samples should be designated using a sample number that ensures that the duplicate is a double-blind sample (i.e., the laboratory cannot determine that the sample is a duplicate). The field crew will assign each duplicate a unique identification beginning with FW-99. The duplicate samples will be analyzed for the same parameters as the primary sample.

4.3 FIELD BLANK SAMPLES

Field blanks are collected to determine if there are any potential sources of sample contamination present in the ambient air at the time of sampling. Field blanks are prepared by transferring analyte-free water into appropriate sample bottleware at the sample collection location. Field blanks will be collected in areas where potential contamination is present in the atmosphere. Field blanks will be collected at a rate of one field blank per day per sampling event. The field crew will assign each field blank a unique identification beginning with FB (e.g. FB-01, FB-02, etc.). The field blanks will be analyzed for the same list of analytes as the investigative samples and will be shipped to the lab with the same set of sample bottles they accompanied into the field.

4.4 EQUIPMENT RINSATE BLANK SAMPLES

Equipment rinsate blanks are used to assess the effectiveness of field equipment decontamination procedures in preventing cross-contamination. If reusable sampling equipment is utilized, the equipment rinsate blanks will be collected daily during a sampling event. The rinsates will be analyzed for the same parameters as the monitoring samples. Equipment rinsate samples will be collected at a rate of one per each day that sampling equipment such as reusable Teflon® and stainless steel bailers and Westbay sampling bottles are decontaminated and reused. Equipment rinsate samples will be collected by pumping or pouring laboratory supplied DI water over non-dedicated equipment after decontamination and collected into appropriate sample bottleware. Each equipment rinsate will be assigned a unique identification beginning with EB (e.g. EB-01, EB-02, etc.)

4.5 MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

As required by the organic analytical methods, matrix spike/matrix spike duplicate (MS/MSD) samples will be analyzed at a frequency of one per every 20 samples or one per shipment, at a minimum. MS/MSD samples of groundwater are obtained by alternately filling sample containers by one-third increments per parameter, with the exception of VOCs, from the same sampling device. For VOCs, entire sample containers will be alternately filled between investigative, MS, and MSD samples. The MS/MSD samples will consist of a field sample spiked in the laboratory with target analytes as specified by the method. Triple volume samples will be obtained to accommodate MS/MSD sample analysis. The field crew will identify MS/MSD samples by noting the well identification followed by MS/MSD (e.g. FW-100MS, FW-100MSD, etc.).

4.6 FILTER BLANK SAMPLES

Filter blank samples are used to assess the cleanliness of the filtration equipment. Groundwater monitoring well samples scheduled for analysis of dissolved metals will be filtered through a 0.45-micrometer filter immediately upon sample collection. All filtered samples will be processed (filtered) in the field. The cleaning procedures for the filtration apparatus, the potential for cross-contamination, and the potential contribution to the sample from the filter itself will be assessed and one filtration blank will be collected for approximately every 20 samples filtered. The filtration blank will be prepared by passing reagent water through a freshly cleaned filtration apparatus, then preserving the sample (if required) for the analyses planned. The field crew will assign each filter blank a unique identification beginning with Filter Blank (e.g. Filter Blank-01, Filter Blank-02, etc.).

5.0 MONITORING AND SAMPLING/ANALYSIS ACTIVITIES

This section describes the required materials and the procedures that will be followed to implement the groundwater monitoring program. The monitoring program consists of measuring and recording groundwater elevation and Non-Aqueous Phase Liquid (NAPL) measurements and groundwater sampling for the monitoring wells. Note that monitoring wells at the Site consist of both standard-construction wells, without multi-port sampling systems, and multiple-screen or open-hole well completions equipped with the Westbay multi-port systems.

Section 5.1 presents the procedures for gauging standard-construction monitoring wells, and Section 5.2 presents the procedures for sampling these wells. Section 5.3 presents the procedures for measurement of water levels in the multi-port monitoring wells, and Section 5.4 presents sampling procedures for these wells. Standard Operating Procedures (SOP) for various aspects of the field activities are provided in Appendix B.

5.1 STANDARD WELL WATER-LEVEL AND NAPL MEASUREMENTS

This section presents the procedures for gauging and sampling the standard-construction monitoring wells at the Site.

5.1.1 Water-Level Measurement Procedure

Water levels in standard-construction monitoring wells will be measured to determine groundwater flow directions and gradients. The list of monitoring wells to be subjected to water-level and NAPL measurements is provided in Table 5-7.

Water levels will be measured before groundwater sampling commences in accordance with FTS SOP #116. The depth to the bottom of the wells will also be measured to monitor the potential accumulation of silt or sand at the bottom of the wells. All monitoring wells will be allowed to equilibrate to atmospheric pressure prior to gauging. The thickness of accumulated NAPL (if any) will also be measured prior to purging and sampling. The primary supplies necessary for the water-level and NAPL thickness measurements are a water-level meter and interface probe as summarized in Table 3-2.

Synoptic water-level measurements will be collected in succession and will proceed from the least impacted wells to the most impacted wells to prevent cross-contamination. Non-impacted upgradient and off-Site downgradient wells will be measured prior to the impacted on-Site wells.

Wells are frequently capped with tight-fitting covers that potentially interfere with proper equilibration with the atmosphere. If the well has not been vented to the atmosphere (e.g., via holes or slots in a cap or loosely-fitting cap) before measurement, the sealing cap will be loosened or removed to allow pressure equilibration between the inside well and the ambient

atmosphere. At least one hour will be allowed for equilibration before conducting a water-level measurement.

The condition of the well riser, lock, cap, casing, and concrete pad will be inspected and recorded on a monitoring well inspection form (Appendix A). Damage (if any) should be reported to the Project Manager and repairs will be implemented as soon as possible. The area around the well should be cleared of weeds and other materials before beginning measurement of the static water level.

Water-level measurements will be taken from the pre-existing surveyed measuring point on the top of the casing. The measuring point location for the well should be clearly marked on the outermost casing (marker, paint, and/or notch filed into the casing rim). If unmarked, the measurement will be taken from the north side of the casing rim.

Water levels at each well will be measured using an electronic device that can be read to an accuracy of ±0.0l foot. The measuring device will be lowered into the center of the well casing to avoid contact with the casing sides and top edges that can lead to erroneous measurements and/or damage the measurement instrument.

As specified in FTS SOP #157, total well depth should not be measured prior to sampling as this activity may disturb material that has settled to the bottom of the well and increase turbidity in samples. A total well-depth measurement will be obtained after the water sample has been collected.

The depth to water (DTW) and depth to bottom (DTB) for each well will be recorded on the groundwater gauging sheet and on the groundwater sampling form (for those wells that are both gauged and sampled).

The water-level probe will be decontaminated after each use to prevent cross-contamination between wells. The probe will be decontaminated by: 1) wiping the line with an isopropanol-saturated cloth; 2) wiping the line with a distilled water-saturated cloth; and, 3) allowing the line to air dry.

5.1.2 NAPL-Thickness Measurement Procedure

An oil/water interface probe will be used in wells where Dense Non-Aqueous Phase Liquid (DNAPL) is suspected to be present. NAPL-Thickness Measurements will be collected in accordance with procedures stated in FTS SOP #116. Once the probe enters the water column, the meter will emit an intermittent tone. Continue to slowly lower the oil/water interface probe until a continuous tone is emitted, indicating that the surface of DNAPL has been reached. The depth to the top of the DNAPL should be read directly from the tape at the measuring point and

recorded on the groundwater gauging sheet. Record the depth to the bottom of the well to determine the apparent thickness of the DNAPL layer.

Quality control measures will include repetitive measurements of the depth to water or NAPL to ensure that accurate and precise results are obtained. Once the measuring device indicates that the water level or NAPL layer has been encountered, the probe will be raised slightly and lowered several times to check and confirm the depth measurement. A single final reading will be recorded on Site-specific gauging sheets that contain the previous round of groundwater, NAPL, and total well-depth measurements. Field crew members will compare readings to assure structural integrity of the monitoring point as well as confirm the well identification. If readings are grossly (> 5%) different from the previous round of measurements, a second reading will be taken and recorded on the appropriate field data sheets.

If DNAPL is detected in a well location where it has not been detected previously, great care will be taken to determine the accuracy of the detection and to avoid reporting a false positive. The presence of a new DNAPL detection will be confirmed by collecting the DNAPL in a clear bailer and documenting it with a photograph.

Note that Light Non-Aqueous Phase Liquid (LNAPL) has not been reported in wells at the Gainesville Cabot Carbon/Koppers Site, therefore, any detections of LNAPL will be visually confirmed with a clear bailer and documented with a photograph.

Measurements will be recorded to the nearest 0.01 foot. The interface probe will be decontaminated after each use in compliance with procedures stated FTS SOP #104 to prevent cross-contamination between wells. The probe will be decontaminated by: 1) wiping the line with an isopropanol-saturated cloth; 2) wiping the line with a distilled water-saturated cloth; and, 3) allowing the line to air dry.

5.1.3 Total Well Depth Measurements

The total depth of each well will also be measured for comparison to the documented well-installation depth. This measurement indicates possible sediment build-up within the well, which may reduce the screened interval and cause turbidity problems, or other potential obstructions in the well. As specified in FTS SOP #157 for low-flow sampling, well depth will not be measured prior to sampling as this activity may disturb material that has settled to the bottom of the well and increase turbidity in samples. A total well-depth measurement will be obtained after the sample has been collected. The DTW and DTB for each well will be recorded on the groundwater gauging form and on a groundwater sampling form (for those wells that are both gauged and sampled).

5.1.4 Documentation

The information discussed in the preceding sections will be recorded on the Site-specific field forms. Additional comments, observations, or details will be entered in the field logbook in accordance with FTS SOP #106 (Appendix B). These documents will provide a summary of the water-level measurement procedures and conditions.

5.2 STANDARD WELL GROUNDWATER SAMPLING PROCEDURES

This section presents the groundwater sampling procedures for the standard-construction monitoring wells.

5.2.1 Materials and Supplies

The list of materials, supplies, and equipment required for groundwater sampling is provided in Table 3-2.

5.2.2 Meter Calibration

All meters will be calibrated before use and at a minimum, once a day. Each probe will be calibrated according to FTS SOP #128 and the manufacturer's instructions found in Appendix B. Information regarding meter calibration will be recorded on the equipment calibration form provided in Appendix A.

5.2.3 Well Purging

5.2.3.1 Low Flow Purging Methodology

Low-flow techniques will be used to purge and sample wells. Monitoring wells containing NAPL will not be sampled. Pumps capable of maintaining purge rates required for implementation of low-flow purge and sampling techniques as specified in FTS SOP #157 will be utilized in monitoring of all standard-construction monitoring wells. Well purging will be conducted using dedicated tubing stored between sampling events in individual sealed plastic bags. Decontamination of dedicated pump tubing is unnecessary since it is thoroughly flushed during purging activities. The tubing will be replaced upon indications of staining or wear. A clean sheet of plastic will be placed at the wellhead to prevent contact of sampling equipment with the ground.

The pump intake will be set to a depth near the middle of the saturated portion of the screened interval of the well by slowly lowering the pump or tubing. Water will then be pumped from the well at a low-flow rate (e.g., 100 - 500 mL/min) to preclude cascading across the well screen such that any fine-grained soil in the well casing, sandpack, or surrounding formation is not

disturbed and entrained in the groundwater samples. For low-yielding wells, the flow rate of the pump may be adjusted to <0.1 L/min.

Rather than purging three well casing volumes before sampling standard-construction wells, the United States Environmental Protection Agency (USEPA) recommends that an in-line water quality meter (e.g., flow through cell) be used to establish stabilization of the groundwater (USEPA, 1996 and USEPA Region 4, 2007). General water quality information to be obtained consists of indicator parameters (i.e., pH, specific conductance, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity). A YSI 556 multi-parameter meter or equivalent will be used to monitor, pH, specific conductance, temperature, dissolved oxygen, and oxidation reduction potential. A LaMotte 2020e or equivalent will be used to monitor turbidity. Factory calibration instructions for the aforementioned instruments are included as part of Appendix B. Groundwater parameter measurements will be recorded between every three (3) to five (5) minutes depending upon flow rate achieved at each monitoring location. At a minimum the entire volume of groundwater held within the flow-through cell will be evacuated every 5 minutes based upon a flow rate of 0.1L/min and a flow-through cell volume of 500mL. The groundwater sample effluent stream will be considered to be representative of the surrounding aquifer formation once three consecutive readings of specific conductivity is within 3 percent of the previous readings, temperature is stable, turbidity readings below 10 NTU or stable, and three consecutive pH readings are within ± 0.2 standard units (SU). Field parameter values and the corresponding purge volume will be recorded on the groundwater sampling form.

After passage through the flow-through chamber, the water will be discharged into a graduated bucket where the pumping rate can be determined with a watch and maintained at a rate of 0.5 L/min or less. All purge water will be transferred to the on-Site wastewater treatment plant.

In the event that the well screen is evacuated during pumping, the well will be allowed to recover, a set of water quality parameters will be recorded, and groundwater samples will be collected immediately after recharge. If the time for complete recovery exceeds two hours, the sample(s) will be obtained as soon as sufficient water volume is available to obtain samples for the requisite analyses.

5.2.3.2 Traditional Purging Methodology

Purging is a process of removing stagnant water from a monitoring well immediately prior to sampling. Purging ensures that all stagnant water has been removed from the well and that groundwater samples are representative of aquifer conditions.

At the Gainesville facility, all wells constructed with multi-screened intervals without multi-port systems will be purged and sampled *via* traditional 3-5 well volume techniques. Traditional 3-5 well volume purging and sampling techniques are typically accomplished by the methods referenced in FTS SOP#102. Well purging will be conducted using dedicated tubing stored

between sampling events in individual sealed plastic bags. Decontamination of dedicated pump tubing is unnecessary since it is thoroughly flushed during purging activities. The tubing will be replaced upon indications of staining or wear. A clean sheet of plastic will be placed at the wellhead to prevent contact of sampling equipment with the ground.

The wells have historically provided sufficient yield, therefore; a submersible pump will be used for purging.

The pump/hose assembly used in purging should be lowered into the top of the standing water column (≤ 5' below the water surface) to pull water from the formation into the screened area of the well and up through the casing so that the entire static volume can be removed. If the pump is placed deep into the water column, the water above the pump may not be removed, and the subsequent samples may not be representative of aquifer conditions. The following general procedure should be followed:

- Determine the required purge volume;
- Place a clean plastic sheet on the ground around the well to prevent contact between the ground and the purging equipment; and,
- Purge the well using either a pump following the appropriate method discussed below.

An adequate purge is achieved when:

- a minimum of 3 to 5 total well volumes of standing water have been removed, *and* the pH, specific conductance, temperature, and turbidity of groundwater have stabilized, where "stabilized" means:

    - pH measurements remain constant within ± 0.2 Standard Unit (SU),
    - specific conductance varies no more than 3 percent,
    - turbidity is below 10 NTU or stable,
    - temperature remains constant for three (3) consecutive readings, or,
    - the well purges dry.

- If, after three well volumes have been removed, the chemical parameters have not stabilized according to the above criteria, additional well volumes (up to five well volumes), should be removed. If the parameters have not stabilized within five volumes, it is at the discretion of the senior Field Team member whether or not to collect a sample or to continue purging. If, after five well volumes, pH and conductivity have stabilized and the turbidity is still decreasing and approaching an acceptable level, additional purging should be considered to obtain the best sample possible, with respect to turbidity.

- Standard procedure is to collect an initial set of the groundwater chemistry parameters at the start of purging activities, with a set of parameters measured after each well volume,

and then periodically until stabilization. The frequency of measurements will depend on the flow rate and well volume.

- If a well is pumped dry, this is considered an adequate purge and the well can be sampled following sufficient recovery (enough volume to allow filling of all sample containers). The pH, specific conductance, temperature, and turbidity should be measured during collection of the sample after the well has recovered, as the measurements of record for the sampling event. All efforts should be made to avoid purging monitoring wells to dryness. This may be accomplished by slowing the purge rate.

5.2.4 Groundwater Sample Collection Method

Groundwater samples will be collected from each standard-construction well using submersible pumps employed during purging efforts. Sampling and purging efforts at these locations will be accomplished using dedicated or disposable Teflon®-lined tubing. After the field measurements of water quality parameters have stabilized, the samples will be collected from the pump discharge line. The Teflon® tubing will be removed from the flow-through cell influent port and the groundwater samples collected directly into the appropriate containers supplied by the laboratory. This procedure will eliminate potential cross contamination from the flow-through cell. The groundwater samples will be collected according to volatility (volatile samples first, semi-volatile samples second, and inorganic samples last). Caution should be employed to ensure that the tubing does not contact the sample bottles during sample collection. Groundwater monitoring wells will be purged and samples collected in accordance with FTS SOP #114 and FTS SOP #157 provided in Appendix B.

Program-specific analytical suites for the Surficial Wells and the HG wells are listed in Tables 2-1 and 2-2. Appropriate laboratory analytical methods for these analyses are provided in the United States Environmental Protection Agency's SW846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, most recent edition. Tables 5-3 and 5-4 present the laboratory reporting limit (RL) and the applicable evaluation criteria for the Surficial and HG wells, respectively. Following collection, all samples will be packaged and placed into a cooler containing ice pending shipment to the laboratory.

5.3 MULTI-PORT SYSTEM WELL GROUNDWATER ELEVATION MEASUREMENTS

Groundwater potentiometric surface elevation data for the multi-port wells identified in Table 5-5 will be measured using the Westbay sampling tool equipped with an integral pressure transducer. Using the sampling tool, an ambient atmospheric pressure reading must be taken at each sample location on each day of sampling. The atmospheric pressure readings must be recorded on the Westbay groundwater sampling field data sheets. Once atmospheric pressure has been measured, the sampling tool is lowered down-hole to engage the desired discrete

interval sampling port. A pore pressure is measured and recorded on the Westbay groundwater sampling field data sheets. It is critical to record associated ambient and pore-pressure measurements observed at each sampling port to enable data reduction necessary for the generation of groundwater potentiometric surface diagrams. Task specific steps for preparing and deploying the Westbay sampling tool as well as engaging and measuring atmospheric and pore pressures are provided in Appendix B (Westbay Multi-Port System Sampling and Decontamination Procedures).

5.4 MULTI-PORT SYSTEM WELL GROUNDWATER SAMPLING PROCEDURES

Similar to measuring pore pressures, collection of groundwater sample volumes employs the use of the Westbay sampling tool. A detailed procedure for the collection of groundwater samples and subsequent decontamination of the sample collection tooling using the Westbay discrete interval sampling system is provided in Appendix B. The Westbay groundwater sampling field data sheet provided in Appendix A must be completed during sampling activities. It is important to follow sequential sampling steps provided on the sample collection sheet to assure proper location, engagement, and access of each discrete interval sampling port. The multi-port sampling equipment is not designed for flow-through cell application. Therefore, groundwater field parameters, such as pH, DO, temp, ORP, turbidity, and conductivity, will not be collected at these wells.

5.5 SAMPLE HANDLING AND SHIPPING

Sample collection and handling will be conducted in accordance with protocols set forth in FTS SOP # 114, provided in Appendix B. For additional information please refer to Section 4.0 and Table 3-1.

5.6 DOCUMENTATION

A number of documents must be completed before and during each sampling event. The documentation includes the calibration forms, groundwater sampling forms, chain-of-custody (COC) sheets, and any project notes pertaining to the sampling work. Following the sampling event, copies of these forms and notes will be made and will be placed in the project files.

CARP Form - This form will be filled out by the Project Manager or designated personnel and submitted to the analytical laboratory prior to each sampling event (Appendix A).

Calibration Forms - The Field Team Leader is responsible for documenting any calibration of instruments used during the sampling event (Appendix A). All calibration information should be recorded on this form daily.

Groundwater Sampling Forms - The groundwater sampling forms serve as logs for information pertaining to each specific sampling location.

Appendix A includes examples of the "Low Flow Groundwater Sample Collection Record" to be completed for each standard construction well sampled, a "Traditional Groundwater Sample Collection Record" to be completed for each well with a multi-screened interval without a multi-port system, and an example of the Westbay Groundwater Sampling Field Data Sheet that will be completed for each zone sampled from a well equipped with the Westbay multi-port system.

Following the groundwater monitoring event, a copy of these forms will be stored in the project file and another will be sent to the Project Manager.

Chain-of-Custody Forms – A primary consideration for environmental data is the ability to demonstrate that samples have been obtained from specific locations and have reached the laboratory without alteration. Evidence of collection, shipment, laboratory receipt, and laboratory custody until disposal will be documented by maintaining a Chain-of-Custody that records each sample and the individuals responsible for sample collection, shipment, and receipt at the project laboratory. Samples that are collected will be accompanied by a Chain-of-Custody Record.

When the field team sends samples to the appropriate analytical laboratories, each ice chest containing samples must be accompanied by a COC Form. These forms contain information pertaining to the samples such as: the project name, the names of the persons collecting the samples, the site of collection, the date and time of collection, the required parameters for each sample, remarks or observations of samples if appropriate, the signature of the person relinquishing control of the samples, and signature of the person receiving the samples (including carrier), and the name of the carrier shipping the samples to the laboratory. The original COC is sent with the samples, and the other copy is stored in the consultant's files.

The purpose of sample custody procedures is to document sample history from the time of collection through shipment, analysis, and disposal. A sample is considered to be in one's custody if one of the following conditions applies:

- The sample is in an individual's actual possession.
- The sample is in view after being in an individual's physical possession.
- The sample is locked up so that no one can tamper with it after having been in an individual's physical possession.

Each individual field sampler is responsible for the care and custody of samples he/she collects until the samples are properly transferred to temporary storage or are shipped to the laboratory.

Custody Seals - The field team will attach custody seals (signature across seal) to sample coolers prior to shipment to the laboratory. Custody seals are used as a mechanism to ensure sample integrity during shipment from the field to the laboratory.

Field Logbook

For all groundwater sampling tasks conducted at the Gainesville facility, field data and pertinent information regarding the sampling event will be recorded into the field logbook in accordance with FTS SOP #106 (Appendix B). Task-specific data sheets including groundwater gauging forms, groundwater sample collection records, equipment calibration sheets, IDW inventory sheets, and Westbay groundwater sampling field data sheets will serve as supplemental data recording locations and will be referenced in the field logbook.

5.7 DATA REDUCTION, VALIDATION, AND REPORTING

A flow diagram depicting the general relationship of data collection, reduction, validation, management, and reporting is shown in Figure 5-1.

5.7.1 Field and Technical Data

Field data collected during field activities will be evaluated for usability by conducting a QA review, which will consist of checking the procedures used and comparing the data to previous measurements. Field QC samples will be evaluated to ensure that field measurements and sampling protocols have been observed and followed. Checks will include the following:

- Use of standard operating procedures (SOPs)
- Calibration method
- Date and time sampled
- Preservation
- Chain-of Custody Records
- Date shipped

5.7.2 QA Data Review

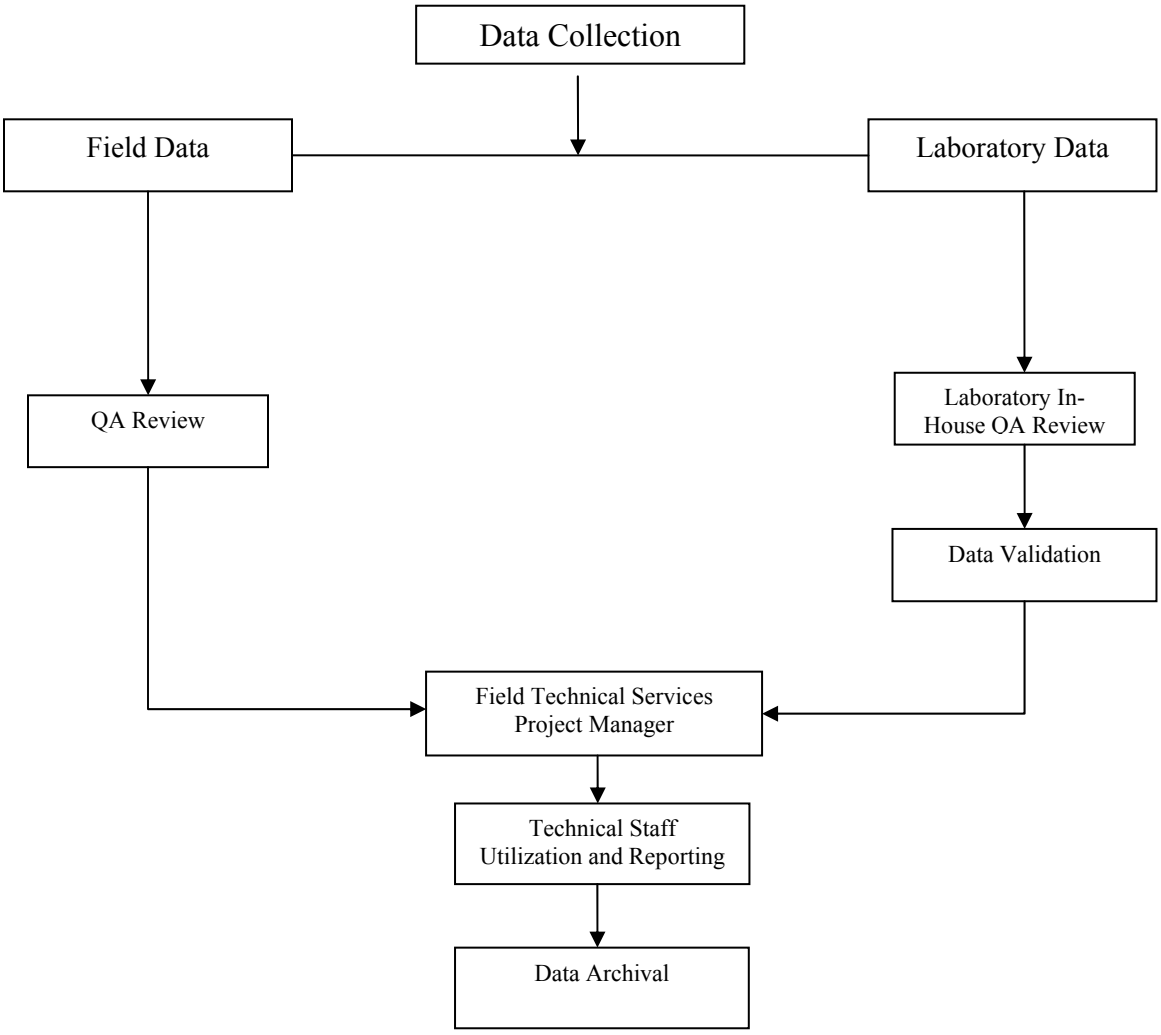
The QA review for usability of objective field and technical data will be performed at two levels. For the first level, data will be reviewed at the time of collection by following standard procedures and QC checks. For the second level, after data reduction to table format or arrays, the data will be reviewed for anomalous values. Any inconsistencies or anomalies identified by this review will be immediately resolved, if possible, by seeking clarification from the field personnel responsible for collecting the data. Inconsistencies and anomalies will be documented during the validation process.

Field data will be reviewed for reasonableness and completeness. In addition, random checks of sampling and field conditions will be made to check recorded data at that time to confirm the recorded observations. Whenever possible, peer review will also be incorporated into the QA review process in order to maximize consistency among field personnel.

5.7.3 Field QA Reports

The Field Technical Services Team Leader will provide the Field Technical Services Project Manager with daily field progress reports and field data sets. The Field Technical Services Project Manager will be immediately notified about field QA situations that require corrective action.

Figure 5-1: Data Management Flow Chart



5.8 FEEDBACK AND CORRECTIVE ACTION

5.8.1 Feedback Mechanism

There are mechanisms within the Project structure that allow for the identification, feedback, and control of any nonconformances or deficiencies. In general, the technical personnel involved with the project are responsible for reporting suspected technical nonconformances through standard communication channels established by the organizational structure. In the same manner, Project personnel are responsible for reporting suspected QA nonconformances.

5.8.2 Corrective Action

Field personnel have the initial responsibility to monitor the quality of field measurements and observations. The Field Team Leader is responsible for verifying that proper procedures are followed. This responsibility requires the Field Team Leader to assess the correctness of field methods and the ability to meet the QA objectives stated in this CGMSAP. If a problem occurs that might jeopardize the integrity of the Project or that might cause a specific QA objective not to be met, the Field Technical Services Project Manager will consult the relevant team members and an appropriate corrective action will be determined and implemented. The Field Technical Services Project Manager will document the problem, the corrective action, and the results.

Field auditing is a recognized technique for evaluating the performance of field sampling teams and assessing how team performance may affect data quality. A field audit may be conducted by a Field Auditor during the collection of samples to ensure that sampling, handling, and transportation to project laboratory provide an independent assurance that procedures are being properly performed and documented. If a problem is identified during a filed audit that might jeopardize the integrity of the project or that might cause a specific QA objective not to be met, the Field Auditor will notify the relevant team members and an appropriate corrective action will be determined and implemented. The Field Auditor will document the problem, the corrective action, and the results. A copy of the documentation form will be provided to the Field Services Project Manager and the QA Oversight Manager.

5.9 LABORATORY ANALYSIS

Analyses will be performed using the United States Environmental Protection Agency's *SW846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, most recent edition*. The contracted laboratory will be certified by NELAC and the Florida Department of Environmental Protection. The specific methods are identified in Tables 5-3, 5-4, and 5-6. The laboratory reports will include the SW846 8260B volatile parameters benzene, ethyl benzene, toluene, and total xylenes; and the following SW846 8270C semivolatile parameters:

SW-846 8270C Semivolatile Organic Parameters to be Reported by the Laboratory		
2,4-Dimethylphenol	2-Methylnaphthalene	2-Methylphenol
3&4 Methylphenol	Acenaphthene	Acenaphthylene
Anthracene	Benzo(a)anthracene	Benzo(a)pyrene
Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Carbazole	Chrysene	Dibenzo(a,h)anthracene
Dibenzofuran	Fluoranthene	Fluorene
Indeno(1,2,3-c,d)pyrene	Naphthalene	Pentachlorophenol
Phenanthrene	Phenol	Pyrene

However, the summary tables in the final report will present the parameters presented in Tables 5-3, 5-4, and 5-6 for evaluation and discussion. The analytical parameters in Tables 5-3, 5-4, and 5-6 have been identified as potential constituents of interest for the Site.

Samples will be analyzed to the reporting limits identified in Tables 5-3, 5-4, and 5-6. Reporting limits reflect the lower of either the laboratory practical quantitation limits (PQLs, also known as method reporting limits, MRLs) or the Florida default Groundwater Cleanup Target Levels (GCTLs) as set forth in 62-777 Florida Administrative Code (F.A.C.). For all parameters, GCTLs are less than or equal to Federal Maximum Contaminant Levels (MCLs) as defined in National Primary Drinking Water Regulations.

For most parameters, the GCTLs are less than or equal to the PQLs/MRLs of the laboratory methods (see Tables 5-3, 5-4, and 5-6). The exceptions are Carbazole, pentachlorophenol, and 4-methylphenol. If one of these parameters is detected, but at a level below the PQL/MRL, then only an estimate of the actual concentration can be made. If this estimate is above the GCTL, then the estimated concentration will be reported and flagged as an estimate.

6.0 MANAGEMENT OF IDW

Purged groundwater will be containerized in 5-gallon buckets and transported to Beazer's on-Site wastewater treatment plant sump, located on the northern side of the Koppers Plant. There the purge water will be treated through the activated-carbon treatment system. Personal protective equipment (PPE) waste will be containerized in a 55-gallon drum with proper labeling and will be disposed by Beazer's Site System Operator as per FTS SOP #122. A summary of waste streams associated with the groundwater sampling program, including estimated annual volumes of each matrix generated and management practices is as follows.

Sampling Method	Type of Waste	Estimated Annual Volume Generated	Typical Management for Disposal
Standard-Construction Well (Low Flow)	Purge Water	125 gal	Transferred to Beazer On-Site Waste Water Treatment Plant
	Decon Fluids	50 gal	Transferred to Beazer On-Site Waste Water Treatment Plant
	PPE and Consumables	1 - 55 gal drum	Containerized in DOT Approved 55-gal Open Top Steel Drums for Off-Site Disposal
Westbay Discrete Interval Sampling (No Purge)	Purge Water	0	Transferred to Beazer On-Site Waste Water Treatment Plant
	Decon Fluids	500 gal	Transferred to Beazer On-Site Waste Water Treatment Plant
	PPE and Consumables	4 – 55 gal drums	Containerized in DOT Approved 55gal Open Top Steel Drums for Off-Site Disposal

All liquid waste, unless otherwise specified, will be transferred to Beazer's on-Site WWTP for treatment prior to discharging to the POTW.

PPE and consumables generated by groundwater sampling only will be handled as non-hazardous waste.

7.0 ANALYTICAL DATA MANAGEMENT

Data evaluation, transfer, and support are essential functions in summarizing monitoring results. It is important that these processes are performed accurately and, in the case of data reduction, accepted statistical techniques are used. The *Quality Assurance Project Plan for the Comprehensive Groundwater Monitoring Plan at Cabot Carbon/Koppers Superfund Site Gainesville, Florida* can be found in Appendix C.

8.0 REPORTING

The semi-annual groundwater monitoring reports will provide Site background information, a summary of groundwater conditions, including data trends and groundwater flow direction. Analytical data will be tabulated and evaluated. As per Section 2.3, sampling frequency will be increased to semiannual where successive annual samples show an increasing concentration of any contaminant, regardless of the specific concentrations observed. Each report will include tables, figures, and appendices necessary to document and support the results of the sampling event. Reports to EPA will include an electronic data format that can be manipulated (such as an Excel™ spreadsheet) in addition to the hard copy or pdf format. The laboratory report and the electronic spreadsheet will include the analytical parameters identified in Section 5.9. The electronic spreadsheet will include independent third party data qualifiers, as applicable. Report tables will include the analytical parameters identified in Tables 5-3, 5-4, and 5-6. The reports will be prepared within 90 days following receipt of laboratory data. Recommendations, if any, will be included within the report.

The data reports will be submitted by Beazer to:

- United States Environmental Protection Agency, Region IV (EPA);
- The Florida Department of Environmental Protection (FDEP); and,
- The Alachua County Environmental Protection Division (ACEPD).

9.0 REFERENCES

EPA Superfund *Record of Decision*, 1990, Cabot/Koppers, EPA ID: FLD980709356, OU 00, Gainesville, FL, EPA/ROD/R04-90/077, September 27, 1990.

Field & Technical Services, LLC, 2008, *2007 Fourth Quarter Floridan Aquifer Groundwater Monitoring Report; and December 2007 Water Quality Results: Upper Floridan Wells FW-04C through FW-24C, Cabot Carbon/Koppers Superfund Site*, Gainesville, Florida, February 15, 2008.

Field & Technical Services, LLC, 2008, *2007 Annual Stage 2 Groundwater Monitoring Report, Cabot Carbon/Koppers Superfund Site*, Gainesville, Florida, prepared for Beazer East, Inc., March 31, 2008.

Field & Technical Services, LLC, 2009, *2009 Third Quarter Floridan Aquifer Groundwater Monitoring Report; and December 2007 Water Quality Results: Upper Floridan Wells FW-04C through FW-24C, Cabot Carbon/Koppers Superfund Site*, Gainesville, Florida, October 13, 2009.

Florida Administrative Code, Rule Chapter 62-777, *Contaminant Cleanup Target Levels*, effective date, April 17, 2005.

GeoTrans, Inc., 2006, *Addendum to the Floridan Aquifer Monitoring Plan, Cabot Carbon/Koppers Superfund Site, Koppers Inc. Site*, Gainesville, Florida. August 18, 2006.

GeoTrans, Inc., 2007, *Supplemental Hawthorn Group Investigation and Monitoring Well Installation Workplan*, submitted to USEPA Region IV, Superfund North Florida Section, July 20, 2007.

GeoTrans, Inc., 2008, *Surficial Aquifer Interim Remedial Measures (IRM) Work Plan, Cabot Carbon/ Koppers Superfund Site,* September 2008.

TRC Environmental Solutions Inc., 1997, *Proposed Stage 2 Ground Water Monitoring Program Initial Ground Water Remedial Action, Cabot Carbon/Koppers Superfund Site*, Gainesville, Florida, prepared for Beazer East, Inc., August 1997.

TRC, 2004, *Floridan Aquifer Monitoring Plan, Cabot Carbon/Koppers Superfund Site*, Gainesville, Florida, prepared for Beazer East, Inc., June 2004.

Key Environmental, Inc., *Site Specific Health & Safety Plan, Koppers Company, Inc. Facility, Gainesville, FL*, prepared for Beazer East, Inc. December 2006.

U.S. Environmental Protection Agency, SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, most recent edition, 1986.

U.S. Environmental Protection Agency, Region 4 Science and Ecosystem Support Division, *Groundwater Sampling Guidance*, November 1, 2007.
U.S. EPA, Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, by Robert W. Puls and Michael J. Barcelona, EPA/540/S-95/504, April 1996.

TABLES

Table 1-1
Chronology of the Floridan Monitoring Program Wells
2003 through March 2010

Well ID	Well Type	Added to Program	Total Locations Sampled	Monitoring Frequency through September 2009	Monitoring Frequency October 2009 through March 2010[1]
FW-2	Standard	2003	1	Semiannual	NS
FW-3	Standard	2003	1	Quarterly	NS
FW-4	Standard	2003	1	Semiannual	Semiannual
FW-5	Standard	2003	1	Semiannual	NS
FW-6[2]	Standard	2004	1	Quarterly	Quarterly
FW-7	Standard	2004	1	Semiannual	NS
FW-8	Standard	2004	1	Semiannual	NS
FW-9	Standard	2004	1	Semiannual	NS
MWTP-MW-1	Standard	2004	1	Semiannual	NS
FW-10B (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	NS
FW-11B (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	NS
FW-12B[2] (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	Semiannual
FW-13B (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	NS
FW-14B (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	NS
FW-15B (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	NS
FW-16B[2] (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	Semiannual
FW-17B (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	NS
FW-18B (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	NS
FW-19B (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	NS
FW-20B[2] (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	Semiannual
FW-21B[2, 3] (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	Quarterly
FW-22B (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	Semiannual
FW-23B (Zones 1,2,3,4)	Westbay	1st Qtr 2006	4	Quarterly	NS
FW-4C (Zones 1,2,3)	Westbay	3rd Qtr 2007	3	Quarterly	Semiannual
FW-22C (Zones 1,2,3)	Westbay	3rd Qtr 2007	3	Quarterly	Semiannual
FW-23C (Zones 1,2,3)	Westbay	3rd Qtr 2007	3	Quarterly	Semiannual
FW-24B (Zones 1,2,3,4)	Westbay	3rd Qtr 2007	4	Quarterly	NS
FW-24C (Zones 1,2,3,4)	Westbay	3rd Qtr 2007	4	Quarterly	Semiannual
FW-25B	Standard	4th Qtr. 2009	1	NA	Quarterly
FW-25C	Standard	4th Qtr. 2009	1	NA	Quarterly
FW-26B	Standard	4th Qtr. 2009	1	NA	Quarterly
FW-26C	Standard	4th Qtr. 2009	1	NA	Quarterly

Notes:

NA - Not Applicable

NS - Not Sampled

[1] Monitoring frequency for the 4th Qtr. 2009 and 1st Qtr. 2010 sampling events based on an email from the U.S. EPA granting temporary approval of the Comprehensive Groundwater Monitoring and Sample Analysis Plan (CGMSAP).

[2] Wells FW-6, FW-12B, FW-16B, FW-20B, and FW-21B were sampled as part of the Quarterly Gainesville Floridan Interim Remedial Measures sampling program during the 4th Qtr. 2009 and 1st Qtr. 2010 sampling events.

[3] Well FW-21B was converted from a Westbay multi-port well into a single screened well in 2009, therefore; multiple monitoring zone samples were no longer applicable during the 4th Qtr. 2009 and 1st Qtr. 2010 sampling events.

Table 2-1
Surficial Aquifer Wells and Monitoring Program Parameters

Well ID	Monitoring Series	Parameters[2],[3]					Sampling Frequency[1]
ITW-12	A	SVOCs	VOCs	--	--	--	Annual
ITW-22	A	SVOCs	VOCs	--	--	--	SA (4 events) then annual
M-3BR	B	SVOCs	VOCs	Arsenic (total and dissolved)	Chromium (total and dissolved)	Pentachlorophenol	Annual
M-9AR	A	SVOCs	VOCs	Arsenic (total and dissolved)	--	--	SA (4 events) then annual
M-9BR	B	SVOCs	VOCs	Arsenic (total and dissolved)	--	--	SA (4 events) then annual
M-12	A	SVOCs	VOCs	Arsenic (total and dissolved)	Chromium (total and dissolved)	Pentachlorophenol	SA (4 events) then annual
M-16A	A	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	QTR (4 events) / SA (2 events) / then Annual
M-16B	B	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	SA (4 events) then annual
M-17	A	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	QTR (4 events) / SA (2 events) / then Annual
M-20B	B	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	SA (4 events) then annual
M-23BR	B	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	SA (4 events) then annual
M-25B	B	SVOCs	VOCs	Arsenic (total and dissolved)	--	Pentachlorophenol	SA (4 events) then annual
M-33B	B	SVOCs	VOCs	--	--	--	SA (4 events) then annual

Notes:

(1) "SA" indicates semiannual; "QTR" indicates quarterly.

(2) "SVOCs" indicates semivolatile organic compounds. The specific list of SVOCs included in the program is provided in Table 5-3.
Note that pentachlorophenol as listed on Table 5-3 will be analyzed for select samples.

(3) "VOCs" indicates volatile organic compounds. The specific list of VOCs included in the program is provided in Table 5-3.

Table 2-2
Hawthorn Group Wells and Monitoring Program Parameters

Well ID	Parameters[2],[3]		Sampling Frequency[1]
HG-2D	SVOCs	VOCs	Annual
HG-4S	SVOCs	VOCs	Annual
HG-4D	SVOCs	VOCs	Annual
HG-5D	SVOCs	VOCs	Annual
HG-6S	SVOCs	VOCs	Annual
HG-6D	SVOCs	VOCs	Annual
HG-10D	SVOCs	VOCs	Annual
HG-12D	SVOCs	VOCs	Annual
HG-16D	SVOCs	VOCs	Annual
HG-16S	SVOCs	VOCs	Annual
HG-20S	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-20D	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-21S	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-21D	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-22D	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-23D	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-24S	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-25D	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-26S	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-26D	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-27S	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-27D	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-29S	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual
HG-29D	SVOCs	VOCs	QTR (4 events) / SA (2 events) / then annual

Notes:

(1) "QTR" indicates quarterly; "SA" indicates semiannual.

(2) "SVOCs" indicates semivolatile organic compounds. The specific list of SVOCs included in the program is provided in Table 5-4.

(3) "VOCs" indicates volatile organic compounds. The specific list of VOCs included in the program is provided in Table 5-4.

Table 2-3
Floridan Aquifer Wells and Monitoring Program Parameters

Well ID	Parameters(2),(3)			Site Location	Westbay Zones	Sampling Frequency(1)
FW-3	SVOCs	VOCs	--	Boundary	n/a	Annual
FW-4	SVOCs	VOCs	--	Boundary	n/a	Semiannual
FW-4C	SVOCs	VOCs	--	Boundary	all	Semiannual
FW-6	SVOCs	VOCs	--	Source area	n/a	Semiannual
FW-10B	SVOCs	VOCs	--	Transect area	all	Annual
FW-11B	SVOCs	VOCs	--	Transect area	all	Annual
FW-12B	SVOCs	VOCs	--	Transect area	all	Quarterly
FW-13B	SVOCs	VOCs	--	Transect area	all	Annual
FW-14B	SVOCs	VOCs	--	Transect area	all	Annual
FW-15B	SVOCs	VOCs	--	Transect area	all	Annual
FW-16B	SVOCs	VOCs	--	Transect area	1	Quarterly
		VOCs	--		2, 3, 4	Annual
FW-17B	SVOCs	VOCs	--	Transect area	all	Annual
FW-18B	SVOCs	VOCs	--	Source area	all	Annual
FW-19B	SVOCs	VOCs	--	Source area	all	Annual
FW-20B	SVOCs	VOCs	--	Source area	1, 2	Quarterly
		VOCs	--		3, 4	Annual
FW-21B	SVOCs	VOCs	--	Source area	n/a	Semiannual
FW-22B	SVOCs	VOCs	--	Boundary	all	Quarterly
FW-22C	SVOCs	VOCs	--	Boundary	all	Semiannual
FW-23B	SVOCs	VOCs	--	Boundary	all	Quarterly
FW-23C	SVOCs	VOCs	--	Boundary	all	Semiannual
FW-24B	SVOCs	VOCs	As (total and dissolved)	Boundary	all	Quarterly
FW-24C	SVOCs	VOCs	As (total and dissolved)	Boundary	all	Semiannual/Annual(5)
FW-25B	SVOCs	VOCs	As (total and dissolved)(4)	Sentinel	n/a	QTR (4 events) / SA (2 events) / then annual
FW-25C	SVOCs	VOCs	As (total and dissolved)(4)	Sentinel	n/a	QTR (4 events) / SA (2 events) / then annual
FW-26B	SVOCs	VOCs	As (total and dissolved)(4)	Sentinel	n/a	QTR (4 events) / SA (2 events) / then annual
FW-26C	SVOCs	VOCs	As (total and dissolved)(4)	Sentinel	n/a	QTR (4 events) / SA (2 events) / then annual
FW-27B	SVOCs	VOCs	As (total and dissolved)	Transect area	all	QTR (4 events) / SA (2 events) / then annual
FW-28B	SVOCs	VOCs	As (total and dissolved)	Boundary	all	QTR (4 events) / SA (2 events) / then annual
FW-29B	SVOCs	VOCs	As (total and dissolved)(4)	Sentinel	n/a	QTR (4 events) / SA (2 events) / then annual
FW-29C	SVOCs	VOCs	As (total and dissolved)(4)	Sentinel	n/a	QTR (4 events) / SA (2 events) / then annual
FW-30B	SVOCs	VOCs	As (total and dissolved)	Transect area	all	QTR (4 events) / SA (2 events) / then annual

Notes:

(1) "QTR" indicates quarterly; "SA" indicates semiannual.

(2) "SVOCs" indicates semivolatile organic compounds. The specific list of SVOCs included in the program is provided in Table 5-6.

(3) "VOCs" indicates volatile organic compounds. The specific list of VOCs included in the program is provided in Table 5-6.

(4) FW-25B, FW-25C, FW-26B, FW-26C, FW-29B, and FW-29C will be sampled for arsenic quarterly until it is either confirmed by two successive sampling events that arsenic is not detected or it is confirmed by four successive sampling events that the arsenic concentration, where present, consistently does not exceed 10 µg/l MCL.

(5) Note that for FW-24C, arsenic analysis is required for Zone 1 on an annual basis only. Arsenic is not required for the other zones. Analysis for SVOCs and VOCs is required on a semiannual basis.

Table 3-1
Bottleware and Analytical Requirements

Parameter	Methodology[(1)]	Sample Bottleware	Preservative	Holding Time
VOCs				
Benzene	SW846 8260B	3-40ml glass vials	HCl / ≤6°C but not frozen	14 days
Ethylbenze	SW846 8260B	3-40ml glass vials	HCl / ≤6°C but not frozen	14 days
Toluene	SW846 8260B	3-40ml glass vials	HCl / ≤6°C but not frozen	14 days
Xylenes, Total	SW846 8260B	3-40ml glass vials	HCl / ≤6°C but not frozen	14 days
SVOCs				
2,4-Dimethylphenol	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
2-Methylnaphthalene	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
2-Methylphenol	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
3&4-Methylphenol	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Acenaphthene	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Acenaphthylene	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Anthracene	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Carbazole	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Dibenzofuran	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Fluoranthene	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Fluorene	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Naphthalene	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Pentachlorophenol	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Phenanthrene	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Phenol	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
Pyrene	SW846 8270C	2-1 liter Glass Amber Bottles	≤6°C but not frozen	7 days to extract, 40 days to analyze extract
METALS				
Chromium, total and dissolved	SW846 6020	1-125ml plastic bottle	HNO_3 / ≤6°C but not frozen	6 months
Arsenic, total and dissolved	SW846 6020	1-125ml plastic bottle	HNO_3 / ≤6°C but not frozen	6 months

Notes:

(1) SW846 refers to *U.S.EPA SW846 Test Methods for the Evaluating Solid Waste* , Physical/Chemical Methods, most recent edition.

Table 3-2
Groundwater Monitoring Supply Checklist

Project Plans

- ☐ CGMSAP
- ☐ Health and Safety Plan
- ☐ Quality Assurance Project Plan

Sample Documentation Supplies

- ☐ Field Logbook
- ☐ Monitoring Well Inspection Form
- ☐ Sampling Order
- ☐ Gauging Order
- ☐ Monitoring Well Gauging Form
- ☐ Groundwater Purging & Sampling Forms
- ☐ Investigation-Derived Waste Summary Log
- ☐ Equipment Calibration Forms
- ☐ Chain-of-Custody Forms
- ☐ Westbay Well Sample Collection Forms

Monitoring Equipment

- ☐ Plastic Sheeting
- ☐ Water Level Meter
- ☐ Oil-Water Interface Probe
- ☐ Water Quality Meter(s)*
- ☐ Calibration Fluids
- ☐ Clear bailers for NAPL confirmation

Decontamination Equipment

- ☐ Spray Bottles
- ☐ Phosphate-free detergent - Alconox
- ☐ Isopropanol / Acetone
- ☐ Distilled Water
- ☐ Potable Water Supply
- ☐ Scrub Brushes
- ☐ 5-Gallon Buckets
- ☐ 4" PVC Decon Trough
- ☐ Paper Towels
- ☐ Aluminum Foil

Sample Packaging Supplies

- ☐ Sample Containers
- ☐ Bubble Wrap
- ☐ Ziploc Bags (1-gal)
- ☐ Garbage Bags

Additional Planning Documents

- ☐ Groundwater Purging and Sampling Forms from previous monitoring event.

Health and Safety Equipment

- ☐ Hard Hat
- ☐ Safety Glasses
- ☐ Steel-Toe Boots
- ☐ Photoionization Detector
- ☐ Tyvek (if needed)
- ☐ Nitrile Gloves
- ☐ First Aid Kit

Sampling Equipment

- ☐ Peristaltic Pump (Field Filtered Analytes)
- ☐ Bladder Pumps/Compressors/Controllers
- ☐ Tubing (1/4"x1/4" PE/Teflon Bonded)
- ☐ Teflon Bladders (Disposable)
- ☐ 45-Micron Filters
- ☐ 3/16" Silicon Tubing
- ☐ Westbay Sampling Equipment
- ☐ Vacuum Pump (Westbay)
- ☐ Power Inverter (Westbay)

Miscellaneous Equipment

- ☐ Well Keys
- ☐ Cellular Phone
- ☐ Stop Watch
- ☐ Electronic Calculator
- ☐ Waterproof Markers/Pens
- ☐ Clipboard
- ☐ Camera

Sample Shipping Supplies

- ☐ Ice
- ☐ Sample Coolers
- ☐ Custody Seals
- ☐ Packaging Tape & Duct Tape

Notes:

* Meters for measurement of temperature, specific conductance, turbidity, pH, DO, and ORP.

Table 4-1
Field Collection Quality Assurance Requirements

ANALYSIS	TRIP BLANK	FIELD BLANK[1]	EQUIPMENT RINSATE BLANKS[2]	FILTER BLANK	FIELD DUPLICATE[3]	MATRIX SPIKE AND MATRIX SPIKE DUPLICATES[4]
Organics[5]	1 per 20 samples for VOCs only	1 per day, per event	1 per day, per event	None	1 per 10 samples or 1 per sample shipment, at a minimum	1 per 20 samples or 1 per sample shipment, at a minimum
Inorganics	None	1 per day, per event	1 per day, per event	1 per 20 samples[6]	1 per 10 samples or 1 per sample shipment, at a minimum	1 per 20 samples or 1 per sample shipment, at a minimum

Notes:

(1) Field blanks will be collected during groundwater sampling procedures to determine any potential sources of sample contamination present in the ambient air at the time of sampling. Field blanks require laboratory provided analyte-free DI water transfered in the field to laboratory supplied clean sample containers.

(2) Equipment rinsate blanks will be collected during groundwater sampling procedures only when non-dedicated sampling equipment is used.

(3) Field duplicates require an additional sample volume. Note that field duplicates will be labeled so the laboratory cannot determine that the sample is a field duplicate.

(4) MS/MSD samples require two additional sample volumes for organic analysis. MS/MSD samples require an additional sample volume for inorganic analysis.

(5) Includes VOCs and SVOCs.

(6) Applicable for dissolved metals only.

Table 5-1
Well Construction Details - Surficial Aquifer Wells

Well ID	TOC Elev (ft amsl)	TD [1]	Top of Screen [1]	Bottom of Screen [1]	Well Dia. (in)
ITW-12	177.49	22.35	6.5	26.5	2
ITW-22	180.54	30.54	3.0	13.0	2
M-3BR	179.60	21.0	16.0	21.0	2
M-9AR	173.80	15.0	5.0	15.0	2
M-9BR	173.22	26.5	21.5	26.5	2
M-12A	181.06	12.7	2.7	12.7	2
M-16A	180.96	13.3	3.3	13.3	2
M-16B	180.56	21.5	16.5	21.5	2
M-17	187.26	13.0	3.0	13.0	2
M-20B	183.67	22.0	17.0	22.0	2
M-23BR	185.10	23.5	18.5	23.5	2
M-25B	186.15	23.0	18.0	23.0	2
M-33B	176.39	27.3	22.3	27.3	2

Notes:

[1] Measurements are feet below top of casing.

Table 5-2
Well Construction Details - Hawthorn Group Wells

Well ID	TOC Elev (ft amsl)	TD [1]	Top of Screen [1]	Bottom of Screen [1]	Well (dia.)
HG-2D	188.88	115.0	100.0	110.0	2
HG-4S	180.41	50.0	40.0	50.0	2
HG-4D	180.91	105.0	95.0	105.0	2
HG-5D	187.73	110.0	100.0	110.0	2
HG-6S	184.86	50.0	40.0	50.0	2
HG-6D	185.02	105.0	95.0	105.0	2
HG-10D	186.84	126.6	105.1	115.1	2
HG-12D	184.64	125.4	108.9	118.9	2
HG-16S	185.07	65.7	55.2	65.2	2
HG-16D	185.07	120.6	108.2	118.2	2
HG-20S	174.37	40.07	29.86	39.63	2
HG-20D	174.33	84.03	73.84	83.60	2
HG-21S	167.72	41.22	30.99	40.76	2
HG-21D	167.90	95.10	84.82	94.60	2
HG-22D	186.20	82.44	71.55	81.55	2
HG-23D	186.70	89.70	79.49	89.24	2
HG-24S	184.28	71.68	61.49	71.25	2
HG-25D	181.30	86.10	75.83	85.58	2
HG-26S	183.21	44.31	34.07	43.84	2
HG-26D	182.92	94.12	83.89	93.65	2
HG-27S	162.48	61.0	51.0	61.0	2
HG-27D	162.42	96.8	86.8	96.8	2
HG-29S	179.17	55.8	45.8	55.8	2
HG-29D	179.17	97.0	87.0	97.0	2

Notes:

[1] Measurements are feet below top of casing.

Table 5-3
Analytical Parameters, Methodology, Reporting Limits, and Evaluation Criteria - Surficial Aquifer Wells

Analytical Parameter*	Methodology[1]	Reporting Limit	Laboratory MRL[2]	Federal MCL[3]	Florida GCTL[4]
		(µg/L)			
Metals					
Arsenic, total and dissolved	SW846 6020	0.5	0.5	10	10
Chromium, total and dissolved	SW846 6020	2	2	100	100
VOCs					
Benzene	SW846 8260B	1	1	5	1
Ethylbenzene	SW846 8260B	1	1	700	30
Toluene	SW846 8260B	1	1	10000	40
Xylene, total	SW846 8260B	3	3	1000	20
SVOCs					
2,4-Dimethylphenol	SW846 8270C	5	5	-	140
2-Methylnaphthalene	SW846 8270C	5	5	-	28
2-Methylphenol	SW846 8270C	5	5	-	35
4-Methylphenol	SW846 8270C	5	5	-	3.5[5]
Acenaphthene	SW846 8270C	5	5	-	20
Acenaphthylene	SW846 8270C	5	5	-	210
Anthracene	SW846 8270C	5	5	-	2100
Carbazole	SW846 8270C	1.8[6]	5	-	1.8
Dibenzofuran	SW846 8270C	5	5	-	28
Fluoranthene	SW846 8270C	5	5	-	280
Fluorene	SW846 8270C	5	5	-	280
Naphthalene	SW846 8270C	5	5	-	14
Pentachlorophenol	SW846 8270C	1[6]	20	1	1
Phenanthrene	SW846 8270C	5	5	-	210
Phenol	SW846 8270C	5	5	-	10
Pyrene	SW846 8270C	5	5	-	210

Notes:

(1) SW846 refers to *U.S.EPA SW846 Test Methods for the Evaluating Solid Waste, Physical/Chemical Methods*, most recent edition.

(2) The laboratory method reporting limit (MRL), as per SW846, is the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

(3) Federal Maximum Contaminant Levels (MCLs) represent the National Primary Drinking Water Standards.

(4) Florida Groundwater Cleanup Target Level (GCTL) are guidelines as set forth in 62-777 Florida Administrative Code (F.A.C.).

(5) 3-Methylphenol and 4-Methylphenol cannot be quantified separately using USEPA SW-846.

(6) If detected at a level below the PQL/MRL, then only an estimate of the actual concentration can be made. If this estimate is at or above the GCTL, but below the PQL/MRL, then the estimated concentration will be reported and flagged as an estimate.

- Indicates that no criteria are available for this parameter.

* In addition to the parameters identified in this table, the laboratory will also report the entire SVOC list identified in Section 5.9 of the CGMSAP.

Table 5-4
Analytical Parameters, Methodology, Reporting Limits, and Evaluation Criteria - Hawthorn Group Wells

Analytical Parameter*	Methodology[1]	Reporting Limit	Laboratory MRL[2]	Federal MCL[3]	Florida GCTL[4]
		(µg/L)			
VOCs					
Benzene	SW846 8260B	1	1	5	1
Ethylbenzene	SW846 8260B	1	1	700	30
Toluene	SW846 8260B	1	1	1000	40
Xylenes, total	SW846 8260B	3	3	-	20
SVOCs					
2,4-Dimethylphenol	SW846 8270C	5	5	-	140
2-Methylnaphthalene	SW846 8270C	5	5	-	28
2-Methylphenol	SW846 8270C	5	5	-	35
4-Methylphenol	SW846 8270C	5	5	-	3.5[5]
Acenaphthene	SW846 8270C	5	5	-	20
Acenaphthylene	SW846 8270C	5	5	-	210
Carbazole	SW846 8270C	1.8[6]	5	-	1.8
Dibenzofuran	SW846 8270C	5	5	-	28
Fluoranthene	SW846 8270C	5	5	-	280
Fluorene	SW846 8270C	5	5	-	280
Naphthalene	SW846 8270C	5	5	-	14
Pentachlorophenol	SW846 8270C	1[6]	20	1	1
Phenanthrene	SW846 8270C	5	5	-	210
Phenol	SW846 8270C	5	5	-	10
Pyrene	SW846 8270C	5	5	-	210

Notes:

(1) SW846 refers to U.S.EPA SW846 *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* , most recent edition.

(2) The laboratory method reporting limit (MRL), as per SW846, is the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

(3) Federal Maximum Contaminant Levels (MCLs) represent the National Primary Drinking Water Standards.

(4) Florida Groundwater Cleanup Target Level (GCTL) ranges are guidelines as set forth in 62-777 Florida Administrative Code (F.A.C.).

(5) 3-Methylphenol and 4-Methylphenol cannot be quantified separately using SW846.

(6) If detected at a level below the PQL/MRL, then only an estimate of the actual concentration can be made. If this estimate is at or above the GCTL, but below the PQL/MRL, then the estimated concentration will be reported and flagged as an estimate.

- Indicates that no criteria are available for this parameter.

* In addition to the parameters identified in this table, the laboratory will also report the entire SVOC list identified in Section 5.9 of the CGMSAP.

Table 5-5
Well Construction Details - Floridan Aquifer Wells

Well ID	TOC Elev (ft amsl)	TD [1]	Top of Screen [1]	Bottom of Screen [1]	Well (dia.)	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6	
						Sampling Port Depth[2]	Sampling Port Elev[3]	Sampling Port Depth[2]	Sampling Port Elev[3]	Sampling Port Depth[2]	Sampling Port Elev[3]	Sampling Port Depth[2]	Sampling Port Elev[3]	Port Depth[2]	Sampling Port Elev[3]	Port Depth[2]	Sampling Port Elev[3]
FW-3	188.56	158.2	148.2	158.2	2"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW-4	173.91	157.5	148.00	158.00	2"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW-4C	174.15	380.1	n/a	n/a	4"	316.19	-142.04	345.19	-171.04	365.19	-191.04	n/a	n/a	n/a	n/a	n/a	n/a
FW-6	185.23	165.05	153.43	163.43	2"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW-10B	187.16	237.9	n/a	n/a	4"	157.73	29.41	177.73	9.41	197.73	-10.59	217.73	-30.59	n/a	n/a	n/a	n/a
FW-11B	184.93	237.1	n/a	n/a	4"	156.77	27.89	176.77	7.89	196.77	-12.11	216.77	-32.11	n/a	n/a	n/a	n/a
FW-12B	183.26	239.7	n/a	n/a	4"	156.40	27.46	176.40	7.46	196.40	-12.54	216.40	-32.54	n/a	n/a	n/a	n/a
FW-13B	181.37	239.3	n/a	n/a	4"	158.57	22.46	178.57	2.46	198.57	-17.54	218.57	-37.54	n/a	n/a	n/a	n/a
FW-14B	178.73	240.7	n/a	n/a	4"	159.64	18.73	179.64	-1.27	199.64	-21.27	219.64	-41.27	n/a	n/a	n/a	n/a
FW-15B	178.20	238.8	n/a	n/a	4"	158.12	20.83	178.12	0.83	198.12	-19.17	218.12	-39.17	n/a	n/a	n/a	n/a
FW-16B	181.19	250.9	n/a	n/a	4"	165.13	15.77	185.13	-4.23	205.13	-24.23	225.13	-44.23	n/a	n/a	n/a	n/a
FW-17B	184.69	240.8	n/a	n/a	4"	159.65	24.85	179.65	4.85	199.65	-15.15	219.65	-35.15	n/a	n/a	n/a	n/a
FW-18B	185.97	238.2	n/a	n/a	4"	157.71	28.01	177.71	8.01	197.71	-11.99	217.71	-31.99	n/a	n/a	n/a	n/a
FW-19B	186.09	237.1	n/a	n/a	4"	157.34	29.07	177.34	9.07	197.34	-10.93	217.34	-30.93	n/a	n/a	n/a	n/a
FW-20B	183.60	238.1	n/a	n/a	4"	157.72	25.64	177.72	5.64	197.72	-14.36	217.72	-34.36	n/a	n/a	n/a	n/a
FW-21B	182.38	237.0	151.90	221.50	4"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW-22B	181.37	237.6	n/a	n/a	4"	156.24	25.54	176.24	5.54	196.24	-14.46	211.24	-29.46	n/a	n/a	n/a	n/a
FW-22C	181.98	386.2	n/a	n/a	4"	321.96	-139.98	349.96	-167.98	364.96	-182.98	n/a	n/a	n/a	n/a	n/a	n/a
FW-23B	172.46	232.4	n/a	n/a	4"	153.09	19.72	173.09	-0.28	193.09	-20.28	213.09	-40.28	n/a	n/a	n/a	n/a
FW-23C	172.87	379.1	n/a	n/a	4"	312.98	-140.11	344.98	-172.11	364.98	-192.11	n/a	n/a	n/a	n/a	n/a	n/a
FW-24B	183.42	243.1	n/a	n/a	4"	165.53	17.89	185.53	-2.11	205.53	-22.11	225.53	-42.11	n/a	n/a	n/a	n/a
FW-24C	183.54	386.6	n/a	n/a	4"	307.26	-123.72	327.26	-143.72	347.26	-163.72	367.26	-183.72	n/a	n/a	n/a	n/a
FW-25B	152.59	229.7	144.7	214.7	4"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW-25C	153.22	380.0	294.8	364.8	4"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW-26B	154.85	229.9	144.9	214.9	4"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW-26C	154.71	388.0	294.7	364.7	4"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW-27B	TBD	300.0	n/a	n/a	4"	155.0	TBD	180.0	TBD	205.0	TBD	230.0	TBD	255.0	TBD	280.0	TBD
FW-28B	TBD	249.0	n/a	n/a	4"	174.0	TBD	194.0	TBD	214.0	TBD	234.0	TBD	n/a	n/a	n/a	n/a
FW-29B	TBD	TBD	TBD	TBD	4"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW-29C	TBD	TBD	TBD	TBD	4"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW-30B	TBD	243.0	n/a	n/a	4"	162.0	TBD	182.0	TBD	202.0	TBD	222.0	TBD	n/a	n/a	n/a	n/a

Notes:

n/a Not applicable.
TBD To be determined.
[1] Measurements are feet below top of casing.
[2] Measurements are feet below top of Westbay casing.
[3] Elevation is feet above/below mean sea level.

Table 5-6
Analytical Parameters, Methodology, Reporting Limits, and Evaluation Criteria - Floridan Aquifer Wells

Analytical Parameter*	Methodology[1]	Reporting Limit	Laboratory MRL[2]	Federal MCL[3]	Florida GCTL[4]
		(µg/L)			
Metals					
Arsenic, total and dissolved	SW846 6020	0.5	0.5	10	10
VOCs					
Benzene	SW846 8260B	1	1	5	1
Ethylbenzene	SW846 8260B	1	1	700	30
Toluene	SW846 8260B	1	1	1000	40
Xylenes, total	SW846 8260B	3	3	-	20
SVOCs					
2,4-Dimethylphenol	SW846 8270C	5	5	-	140
2-Methylnaphthalene	SW846 8270C	5	5	-	28
2-Methylphenol	SW846 8270C	5	5	-	35
3&4-Methylphenol	SW846 8270C	3.5[6]	5	-	3.5[5]
Acenaphthene	SW846 8270C	5	5	-	20
Acenaphthylene	SW846 8270C	5	5	-	210
Anthracene	SW846 8270C	5	5	-	2100
Carbazole	SW846 8270C	1.8[6]	5	-	1.8
Dibenzofuran	SW846 8270C	5	5	-	28
Fluoranthene	SW846 8270C	5	5	-	280
Fluorene	SW846 8270C	5	5	-	280
Naphthalene	SW846 8270C	5	5	-	14
Phenanthrene	SW846 8270C	5	5	-	210
Phenol	SW846 8270C	5	5	-	10
Pyrene	SW846 8270C	5	5	-	210

Notes:

(1) SW846 refers to U.S.EPA SW846 *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, most recent edition.

(2) The laboratory method reporting limit (MRL), as per SW846, is the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

(3) "MCLs" refer to Federal Maximum Contaminant Levels.

(4) Florida Groundwater Cleanup Target Level (GCTL) ranges are guidelines as set forth in 62-777 Florida Administrative Code (F.A.C.).

(5) 3-Methylphenol and 4-Methylphenol cannot be quantified separately using USEPA SW846.

(6) If detected at a level below the PQL/MRL, then only an estimate of the actual concentration can be made. If this estimate is at or above the GCTL, but below the PQL/MRL, then the estimated concentration will be reported and flagged as an estimate.

- Indicates that no criteria are available for this parameter.

* In addition to the parameters identified in this table, the laboratory will also report the entire SVOC list identified in Section 5.9 of the CGMSAP.

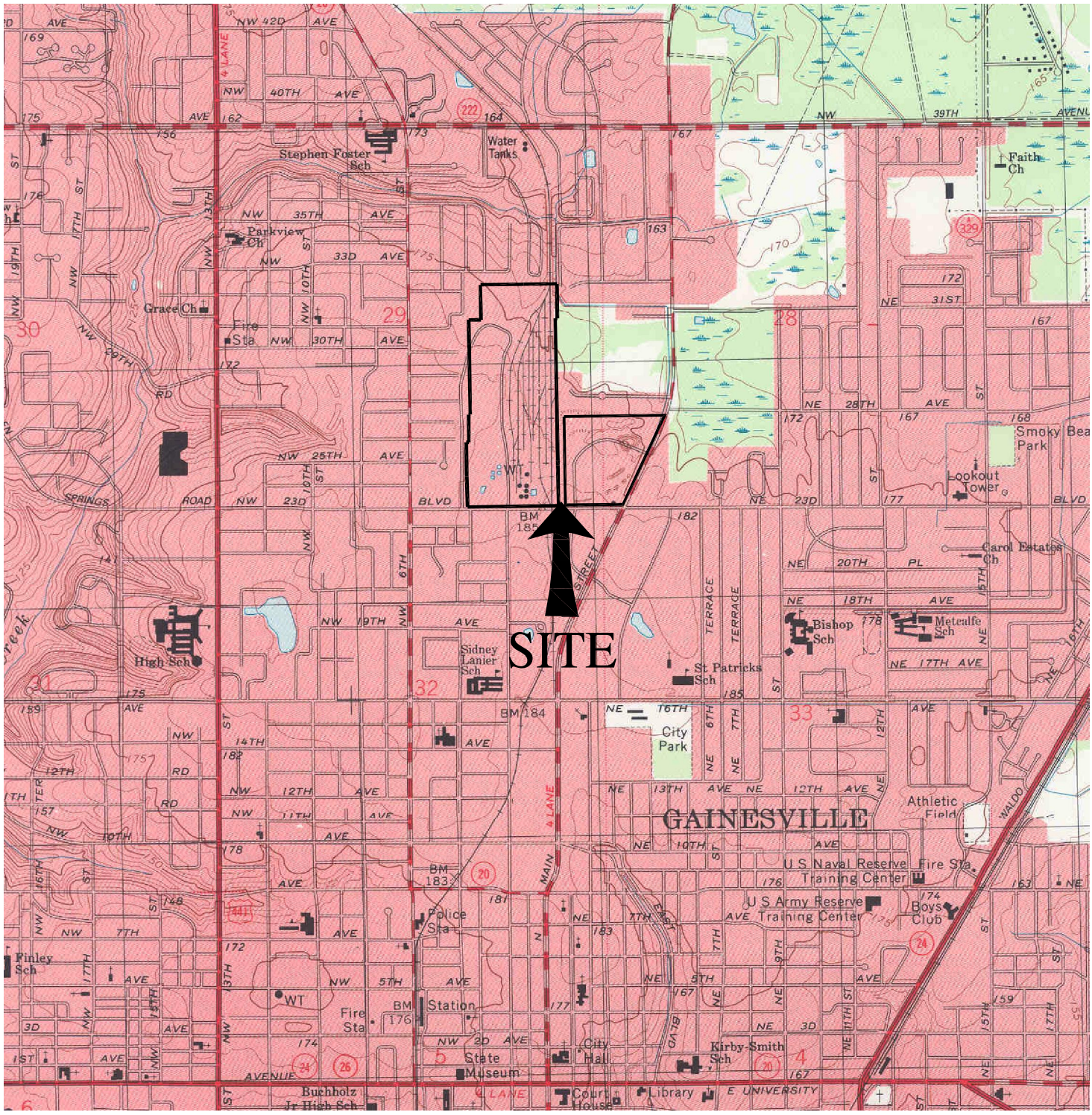
Table 5-7
Hydraulic and NAPL Monitoring Program Wells

Well ID	Aquifer	Frequency[(1)]
FW-1	Floridan	Annual
FW-2	Floridan	Annual
FW-3	Floridan	Annual
FW-4	Floridan	Annual
FW-5	Floridan	Annual
FW-6	Floridan	Annual
FW-7	Floridan	Annual
FW-8	Floridan	Annual
FW-9	Floridan	Annual
HG-2D	Lower Hawthorn	Semiannual
HG-4S	Upper Hawthorn	Semiannual
HG-4D	Lower Hawthorn	Semiannual
HG-5D	Lower Hawthorn	Semiannual
HG-6S	Upper Hawthorn	Semiannual
HG-6D	Lower Hawthorn	Semiannual
HG-10D	Lower Hawthorn	Annual
HG-12D	Lower Hawthorn	Annual
HG-16S	Upper Hawthorn	Annual
HG-16D	Lower Hawthorn	Annual
HG-20S	Upper Hawthorn	Semiannual
HG-20D	Lower Hawthorn	Semiannual
HG-21S	Upper Hawthorn	Semiannual
HG-21D	Lower Hawthorn	Semiannual
HG-22D	Lower Hawthorn	Semiannual
HG-23D	Lower Hawthorn	Semiannual
HG-24S	Upper Hawthorn	Semiannual
HG-25D	Lower Hawthorn	Semiannual
HG-26S	Upper Hawthorn	Semiannual
HG-26D	Lower Hawthorn	Semiannual
HG-27S	Upper Hawthorn	Semiannual
HG-27D	Lower Hawthorn	Semiannual
HG-29S	Upper Hawthorn	Semiannual
HG-29D	Lower Hawthorn	Semiannual
ITW-12	Surficial	Annual
ITW-22	Surficial	Annual
M-9AR	Surficial	Annual
M-9BR	Surficial	Annual
M-16B	Surficial	Annual
M-17	Surficial	Annual
M-20B	Surficial	Annual
M-23BR	Surficial	Annual
M-25B	Surficial	Annual
M-33B	Surficial	Annual

Notes:

[(1)] In addition to the frequency listed above, hydraulic monitoring will take place at a monitoring well each time the well is sampled.

FIGURES



0 2000 4000 FEET

N

FLORIDA

QUADRANGLE LOCATION

REFERENCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLES
GAINESVILLE EAST, FLORIDA – 1994

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	CRJ	DATE:	07/25/07
CHKD:	RMB	DATE:	07/25/07
APPD:	AMG	DATE:	07/25/07
SCALE:	1" = 2000'		
ISSUE DATE:			

FTS

FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

COMPREHENSIVE GROUNDWATER MONITORING AND SAMPLE ANALYSIS PLAN
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

SITE LOCATION MAP

PROJECT NO:T004508-08
DRAWING NUMBER
FIGURE 1-1

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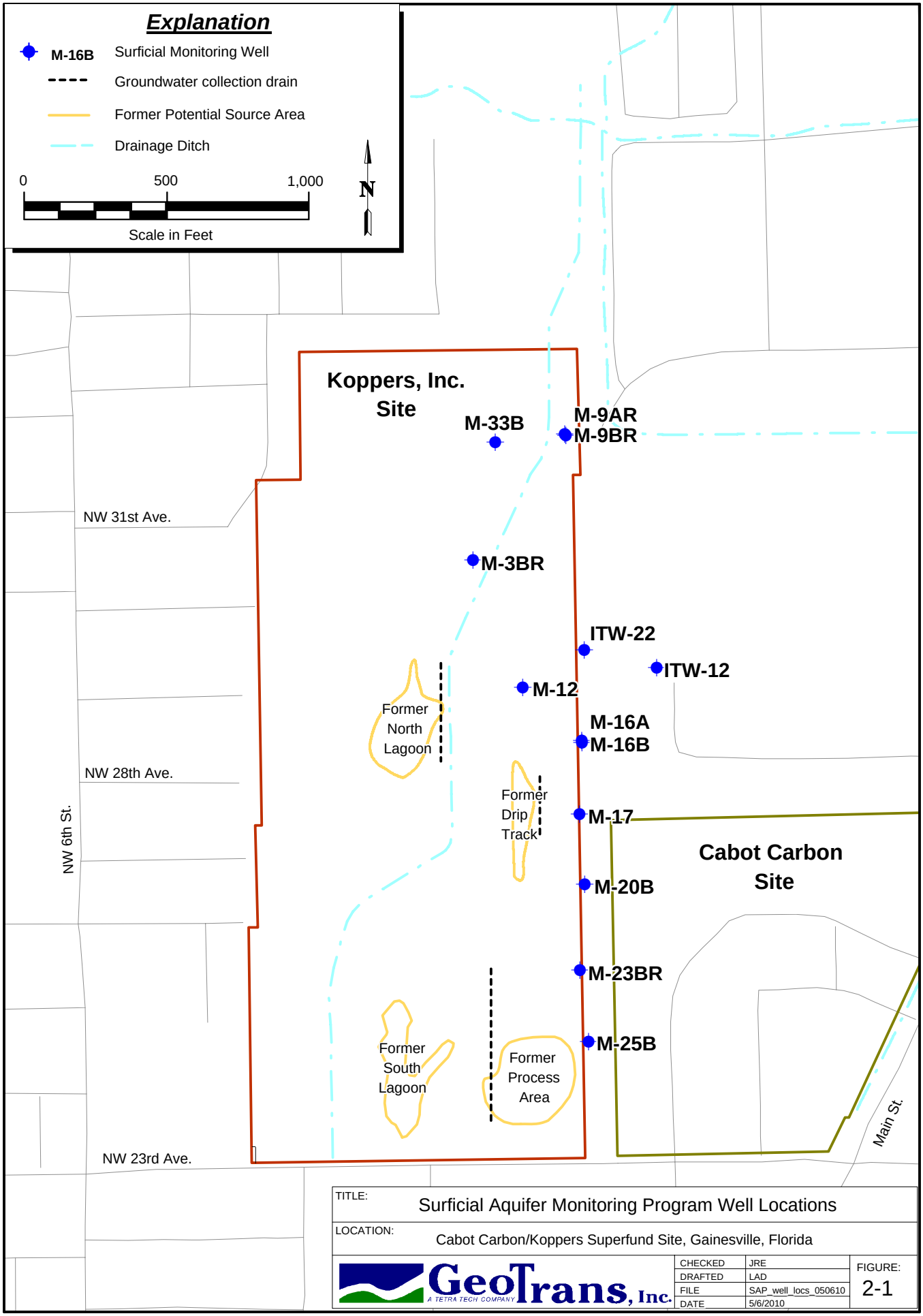

TITLE: Surficial Aquifer Monitoring Program Well Locations

LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	JRE
DRAFTED	LAD
FILE	SAP_well_locs_050610
DATE	5/6/2010

FIGURE: 2-1

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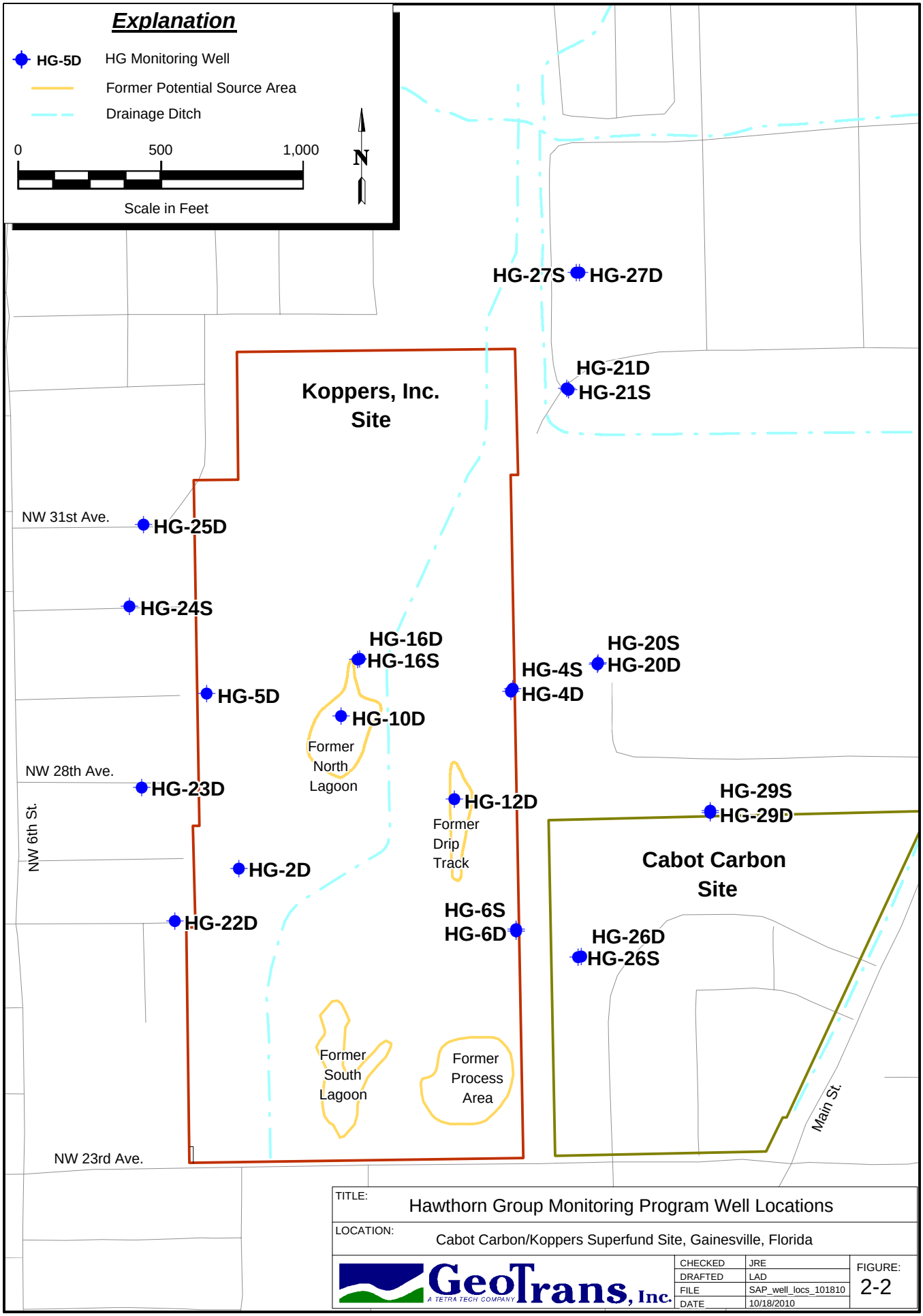


TITLE: Hawthorn Group Monitoring Program Well Locations

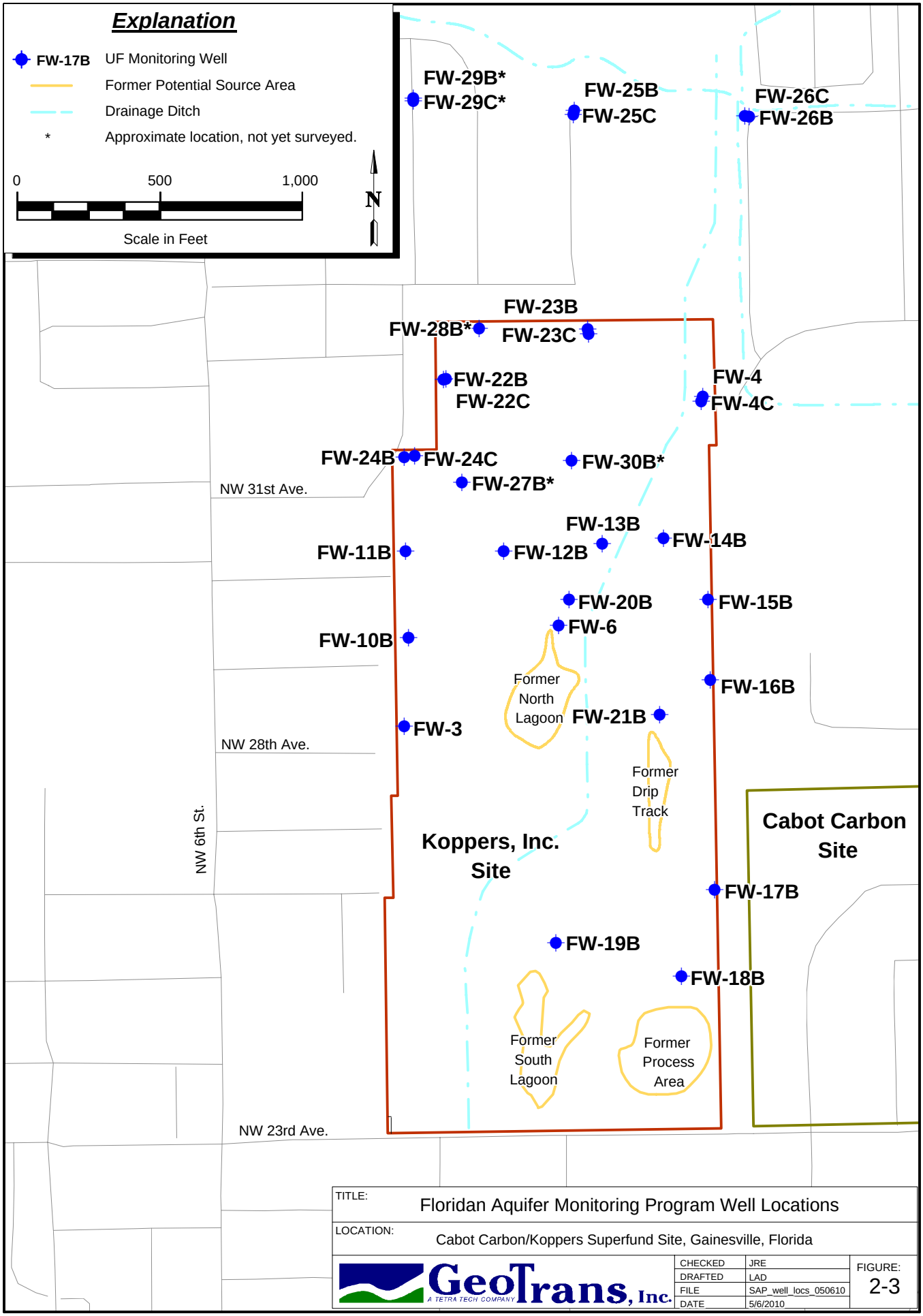
LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	JRE
DRAFTED	LAD
FILE	SAP_well_locs_101810
DATE	10/18/2010

FIGURE: 2-2

t:/gainesville/mapinfo/wells/SAP_well_locs_101810.WOR (Layout 2)



t:/gainesville/mapinfo/wells/SAP_well_locs_050610.WOR (Layout 1)

APPENDIX A

Pre-Sampling Briefing

Project: _____ **Date of Pre Job Meeting** _____
Project Number: _____ **Date of Mob:** _____
Location: _____ **Date of De-Mob:** _____

FTS Field Crew

Name:

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

Pre-Mob Check List				
MOB/DEMOB	**YES**	**NO**	**NA**	**COMMENTS**
Travel Schedule Submitted	☐	☐	☐	
HASP Review	☐	☐	☐	
Equipment Order Confirmation and Review	☐	☐	☐	
CARP Completed – Bottle Delivery Confirmed	☐	☐	☐	
Sample Order Confirmation & Review	☐	☐	☐	
Plant Manager Contacted (if Applicable)	☐	☐	☐	
Applicable Site Specific training Completed by All Members of Field Crew	☐	☐	☐	
Sub Contractor Debriefed	☐	☐	☐	
SCOPE				
Site Data Sheet Checked Against SAP	☐	☐	☐	
Site Data Sheet Reviewed	☐	☐	☐	
SOW Confirmed	☐	☐	☐	
Additional Out of Scope Work Confirmed	☐	☐	☐	
Previous GW Sampling Event Field Logs-Review	☐	☐	☐	
COMPLIANCE ACTIVITIES REQUIRED				
Annual RCRA Inspection/Audit	☐	☐	☐	
On-Site Filing/File Review	☐	☐	☐	
SI and/or Facility Inspection	☐	☐	☐	
Monitoring Well Inspection	☐	☐	☐	
IDW				
IDW Management Confirmed	☐	☐	☐	
Proper Labels Supplied to Sampling Leader	☐	☐	☐	

Field Supervisor: _____ **Date:** _____

Lead Sampler: _____ **Date:** _____

LOW-FLOW GROUNDWATER SAMPLE COLLECTION RECORD

WELL NO.: _____

PERMIT NO.: _____

Project No.: _____ **Client:** Beazer, Inc.

Project Name: _____ **Project Location:** _____

Weather Conditions: _____ **Sampling Date:** _____

1. WATER LEVEL DATA (measured from top of inner well casing)

a. **Depth to LNAPL:** _____ (ft) b **Depth to Water:** _____ (ft)

c. **Depth to DNAPL:** _____ (ft) d **Total Well Depth:** _____ (ft)

e. **LNAPL Thickness:** (a-b) _____ (ft) f. **DNAPL Thickness:** (c-d) _____ (ft)

g. **Length of Water Column:** _____ (ft) (a-d)

h. **Well Volume:** _____ (gal)

Conversion Factors (a x cf = h)	
Well I.D.	Conv. Fact. (cf)
1	0.041
2	0.163
4	0.653
6	1.470

2. WELL PURGE DATA

a. **Purge Method:** _____

b. **Field Testing Equipment:** _____

c. **Required Total Purge Volume (1f x 2c) (gals.):** NA

d. **Total Volume and Number of Well Volumes Removed:** _____

e. **Begin Purge Time:** **End Purge Time:**

Read No.	Lapse Time (min.)	Purge Rate (ml/min)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Eh/ORP (mV) (±10mV)	Diss O2 (mg/L) (±10%)	TURB (NTU) (<10 NTU or Stable)	Water Level (ft)	Notes
PRE PURGE VALUES										
PURGING VALUES										

3. SAMPLE COLLECTION DATA **Sampling Personnel:** _____

Sampling Method(s) & Equip: _____

Sample I.D. (Name, Date, Time): _____

Sample Analytical Parameters/Method: _____

Sample Start Time: **End SampleTime:**

COMMENTS:

WELL NO.:

GROUNDWATER SAMPLE COLLECTION RECORD

Project No.: _____ **Date:** _____ **Time: Start:** _____ am/pm
Project Name: _____ **Finish:** _____ am/pm
Location: _____
Weather Conditions: _____ **Collector:** _____
Print Sign

1. WATER LEVEL DATA (measured from top of well casing)

a. Total Casing Length: _____ (ft) **b. Well Casing Type:** _____

c. Depth to Water: _____ (ft) **d. Casing Diameter:** _____ (in)

e. Length of Water Column: _____ (ft) (a-c)

f. Well Volume: _____ (gal)

Conversion Factors (cf)
(e x cf = f)

Casing I.D. (in)	Conv. Fact.
1	0.041
2	0.163
3	0.367
4	0.653
6	1.470

2. WELL PURGE DATA

a. Purge Method: _____

b. Field Testing Equipment: _____

c. Number of Well Volumes to Remove: _____

d. Required Total Purge Volume (1f x 2c): _____

Vol. Purged (Gallons)	Temp (deg. C) (Constant)	pH (s.u.) (±0.2)	Spec. Cond. (ms/cm) (±3%)	Turbidity (NTU) (<10 NTU or Stable)	Notes

3. SAMPLE COLLECTION INFORMATION

Sampling Method(s): _____

Sample Identification (name, time, date): _____

QC Samples (name, time, date): _____

_____

Analytical Parameters and Methods: _____

_____

Comments: _____

_____

_____

_____

_____

Westbay Groundwater Sampling

Field Data Sheet

Date:

Start Time:

End Time:

Technicians:

Zone No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sampling Collection Checks (probe located at sampling zone in MP casing)								Comments (volume retrieved)
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port ( ) Arm out ( ) Land probe ( )	Pressure in MP ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in MP ( )	

Gainesville, FL
Groundwater Gauging Sheet
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Order	Well	Date	Time	Previous Depth to Water (ft) 1st round	Depth to Groundwater (ft) 1st round	Previous Total Depth (ft)	Total Depth (ft)	Previous Depth to LNAPL (ft)	Depth to LNAPL (ft)	LNAPL Thickness (ft)	Previous Depth to DNAPL (ft)	Depth to DNAPL (ft)	DNAPL Thickness (ft)	PID Reading (ppm)	Comments

Field & Technical Services, LLC
RCRA Facility Groundwater Monitoring Well Inspection Form

Site Name:_____ Site Phone:_____

Inspector Name:_____ Audit Date: _____

KI Contact: _____ KI Phone:_____ Inspector Signature: _____

Well ID	Well Condition						
	Lock	Casing	Cap	Pad/Drainage	Vegetation/Accessibility	Potential Hazards	Comments

Field & Technical Services, LLC
RCRA Facility Groundwater Monitoring Well Inspection Form

Site Name:_____

Well ID	Well Condition						
	Lock	Casing	Cap	Pad/Drainage	Vegetation/Accessibility	Potential Hazards	Comments

Field & Technical Services, LLC
RCRA Facility Groundwater Monitoring Well Inspection Form

Site Name:_____

Well ID	Well Condition						
	Lock	Casing	Cap	Pad/Drainage	Vegetation/Accessibility	Potential Hazards	Comments

Notes:

Summary:

EQUIPMENT CALIBRATION FORM

INSTRUMENT: _____

SERIAL NO.: _____

DATE	TIME	PARAMETER	CALIBRATION READING	CALIBRATION RECORDED BY
		4.00		
		7.00		
		pH 10.00		
		Specific Conductivity		
		ORP		
		Dissolved Oxygen		
		Turbidity		
		Temperature		

INSTRUMENT: _____

SERIAL NO.: _____

DATE	TIME	PARAMETER	CALIBRATION READING	CALIBRATION RECORDED BY
		4.00		
		7.00		
		pH 10.00		
		Specific Conductivity		
		ORP		
		Dissolved Oxygen		
		Turbidity		
		Temperature		

Field & Technical Services

FTS

IDW INVENTORY LOG

Date:

Project Name:

Project Number:

Location:

Container Identification Number	Type of IDW (SW, GW, NAPL, PPE, Other)	Start Accumulation Date	Date Filled	Comment / Label Description	Staging Location

FTS

CHAIN OF CUSTODY

200 Third Ave
Carnegie, PA 15106
Phone (412) 429-2694
Fax (412) 279-4512

Project No.:	Project Name:
Samplers: (signatures)	

Sample I.D.	Date	Time	Comp	Grab	Sample Location Description	Number of Containers										Requested Analyses

Relinquish By: (signature)	Date	Time	Received By: (signature)	Date	Time	Notes:
Relinquish By: (signature)	Date	Time	Received By: (signature)	Date	Time	
Relinquish By: (signature)	Date	Time	Received By: (signature)	Date	Time	

Distribution: Original to Accompany samples; Copy Returned with Report

CHEMISTRY ANALYTICAL REQUEST PROCEDURE FORM (CARP)

Beazer PO No: _____

I *Project Information*

Project Name: _____

Site Address: _____ _____

_____

City _____ State _____ Zip _____

Regulatory Agency: Federal (region): _____ State _____ Other _____

Project Type (circle): RCRA CERCLA Other (specify): _____

Anticipated Start Date: _____ Anticipated Completion Date: _____

Deliver bottles no later than: _____

II *Project Management Contacts*

Beazer East, Inc. Contact

Beazer East, Inc. Environmental Manager: _____

Address One Oxford Centre E-mail _____

Suite 3000 Phone # (412) 208-

City Pittsburgh State PA Zip 15219 FAX # (412) 208-

Primary Engineering Firm Contact

Designated Consultant Firm Name: _____

Designated Consultant Project Manager: _____

Address _____ E-mail _____

_____ Phone # ( )

City _____ State _____ Zip _____ FAX # ( )

Laboratory Contact

Laboratory Name: _____

Laboratory Project Manager: _____

Address _____ E-mail _____

_____ Phone # ( )

City _____ State _____ Zip _____ FAX # ( )

III *CARP ID#*

CARP ID#

	Site #		Phase #		Month/Year
Investigation Phase:	Investigation (0400)				
O&M Phase:	RCRA (0705)	Interim (0710)	Final (0715)		
Monitoring Phase:	Sitewide (0520)	RCRA (0505)	Stormwater (0555)	Post Remedial (0560) (0560)	
RD Phase:	Unit Specific (0805)	Interim (0810)	Sitewide (0820)	Contractual (0830)	
RA Phase:	Unit Specific (0905)	Interim (0910)	Sitewide (0920)	Contractual (0930)	

IV *Data Deliverables and Turn Around Time (TAT) Requirements*

Turn-around Time for Deliverables Options:

Level Code	**Level 1**	Level Code	**Level 2**	Level Code	**Level 3**	Level Code	**Level 4**	Level Code	Other
A1	1 calendar day	B2	2 calendar days	C7	business da	D7	7 business days	E7	
A2	2 calendar days	B7	7 business days	C21	l calendar da	D21	21 calendar days	E21	
A7	7 business days (standard TAT)	B21	21 calendar days (standard TAT)		(standard TAT)		(standard TAT)		

Deliverables supplied to: _____

Special Instructions:

V *Parameters and Analytical Methods Requested*

		Investigatory Samples			*Quality Control Samples*					
Compound List or Parameter	Analytical Method	Aqueous Samples	Solid Samples	Sample Pair	Number of Trip Blanks	Number of Field Blanks	Number of Field Duplicates	Solid Samples Collected	Aqueous Samples Collected	Level Code

Are MS/MSD samples billable (if < 10 samples/SDG)? _____

Bottle type requested*: prepreserved? _____ Unpreserved (with preservation kit)? _____

Ship Bottles To: _____

Address _____

_____

City _____ State _____ Zip _____ Phone Number: _____

Is analyte-free water needed for field blanks? _____ If so, how much volume? _____

Are trip blanks needed? _____ If so, how many vials? _____

Additional Request Description.

*Note: For dioxin/furan analyses, sample volume sufficient for a minimum of two sample preparations must be collected for each sampling point.

Are special regulatory requirements or detection limits needed?

Are reporting estimated values "J" required for results less than the reporting limit?

Are Tentatively Identified Compounds (TICs) required? Volatiles Semivolatiles

If so, please attach list to CARP or list here.

Does an approved QAPP exist?

Has a copy been forwarded to the Laboratory?

VI *Request For Methods*

Request for Methods not included in Laboratory Specifications Manual (Table 2 and Lab Profile)

Method Number

Lab Use Only.

Do any of these analyses need to be subcontracted?

Which parameters

Subcontract Laboratory Has the subcontracted lab been audited?

Address

City State Zip

VII *Additional Request and instructions*

VIII *Signature Approvals for Initiation of Project*

Approval and Signatures	Initial Review Date
Designated Consultant Project Manager	_____
Laboratory Project Manager	_____
Beazer East, Inc. Environmental Manager	_____

All three final approval signatures and dates must be completed to obtain a purchase order.

Purchase Order Number: _____

IX Verification of Samples Collected and Analyzed upon Project Completion

For Designated Consultant only:

List number of samples collected that are below or above the numbers projected in above section in the last two columns of the table above. This will verify the actual number of samples collected for billing purposes.

Discrepancies: _____

Turn around time: _____

Designated Consultant Project Manager Signature _____ Date _____

For Laboratory only:

Does laboratory concur with the correct number of samples collected and analyzed as listed above? _____

Does the invoiced number of samples agree with totals on page 2? If not, contact designated Consultant Project Manager.

This will verify the actual number of samples analyzed for billing purposes.

Laboratory Project Manager Signature _____ Date _____

For Data Validator only:

The number of samples collected and analyzed were found to be in accordance with the requirements for this project.

Data Validation Project Manager Signature _____ Date _____

x ***Project Budget Detail***

CARP ID: _____

PO NUMBER: _____

Contract Rates*** _____Yes _____No

INVOICE NUMBERS: _____

Analytical Method	Projected Number of Samples*	Sample Matrix (Solid or Aqueous) **	Unit Price***	Projected Extended Cost	Actual Number of Samples	Actual Extended Cost
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00
				$0.00		$0.00

Projected Total Cost **$0.00** **Actual Total Cost** **$0.00**

Notes:

* List solid and aqueous samples as separate line items

** "S" - Solid sample "A" - Aqueous samples

***Lab costs should be the current contract rates unless otherwise agreed upon on a project-specific basis

APPENDIX B

#102
MONITORING WELL SAMPLING

#102 - MONITORING WELL SAMPLING

1.0 SCOPE AND PURPOSE

This standard operating procedure (SOP) provides guidelines for collection of groundwater samples from monitoring wells. Groundwater samples are typically collected from monitoring wells for laboratory analysis to support an evaluation of the nature and extent of constituents in groundwater. Samples may also be collected for parameters which provide general groundwater chemistry information or are indicators of natural attenuation.

2.0 REQUIRED MATERIALS

Groundwater sampling may require a relatively extensive list of equipment and protective clothing. This list can be summarized as follows*:

- Purging/Sample Collection Equipment
  - Bailers (bottom filling);
  - Centrifugal pump;
  - Submersible pump;
  - Peristaltic pump; and/or,
  - Bladder pump.

- Related Sampling and Field Measurement Equipment
  - Groundwater Quality Meter (Temp, pH, Cond, DO, ORP, Turb);
  - Filtration apparatus (vacuum or disposable); and/or,
  - Water-level and/or NAPL-level measurement equipment.

- General Equipment
  - Safety Glasses or equivalent eye protection;
  - Distilled water and dispenser bottle;
  - Decontamination solutions (i.e. Alconox);
  - Field data sheets and log book;
  - Sample preservation solutions;
  - Sample containers;
  - Buckets and intermediate containers;
  - Coolers;
  - First aid kit;

*Depending on project-specific requirements, not all materials may be necessary.

- Key(s) for well locks; and/or,
- Stopwatch.

- Disposable Materials
  - Plastic sheeting/bags;
  - Pump tubing;
  - Bailer cord;
  - Nitrile Gloves;
  - 0.45 Micron inline Filters;
  - Chemical-free paper towels; and/or,
  - Protective coveralls (e.g., Tyvek), if necessary.

3.0 METHODOLOGIES

Several methods or combination of methods may be used to collect groundwater samples from monitoring wells. The chosen methodology(ies) will depend on the parameters to be analyzed, depth of the well, diameter of the well, depth to groundwater, and the required volume of water. Where practical, dedicated or disposable sampling equipment should be used for purging and sample collection to reduce field decontamination requirements and minimize the potential for cross contamination of samples.

Several tasks need to be completed prior to actual sampling of each well. These preparatory activities can be summarized as follows:

- Log in proper sample bottles received from laboratory, confirm that the laboratory provided deionized water (if needed) and proper laboratory-preserved bottle ware as needed for the sampling event.
- If necessary, prepare bailers and/or pumps with standard decontamination procedures as specified in FTS SOP #104.
- Don the necessary personnel protective equipment (PPE) stipulated in the Site health and safety plan (HASP).
- Measure static water level prior to well purging. Water levels are to be measured to the nearest hundredth of a foot with an electronic probe from the established surveyed measuring point of the well casing. If water levels will be used to determine groundwater flow direction and/or hydraulic gradients, all measurements should be taken during the same work day or over as short a time period as possible.

Following water level measurements, all wells will be purged to assure collection of representative groundwater samples.

3.1 Well Purging

To calculate the amount of water to purge from each well, the depth of standing water must be measured using one of the above noted procedures. In addition, the casing diameter of each well must be known. These measurements, along with the following appropriate numbers, must be inserted into a formula for volume of a cylinder ($\Pi r^2 h$), where r is well radius and h is height of water column.

Wells will be purged until at least three casing volumes of water are removed from each well or until the site specific monitored groundwater parameters (i.e. Temp, pH, Cond, and Turbidity), of the purge water has stabilized. If a well is purged dry prior to removal of three well casing volumes, purging will be considered complete. Groundwater samples will be collected once a sufficient volume of groundwater has accumulated in the well to completely fill the necessary sample containers.

To verify the removal of the required well volumes during purging, a graduated container will be used to measure purge water quantities.

Wells will be purged and sampled by either hand bailing or pumping.

Bailers

The following procedures are followed when wells are purged and samples are extracted using bailers.

1. Place plastic sheeting (or garbage bags) around the well casing and/or in a clean bucket to create a clean surface for the placement of sampling cord and equipment.

2. Use a dedicated, cleaned, Teflon® bailer (when collecting VOC and SVOC samples) or dedicated or disposable polyethylene bailer at each well for the required purging and sampling.

3. Use new nitrile gloves when working on each well.

4. Use new nylon cord to tie on each bailer.

    - Make sure the knotted cord is securely tied to the bailer.
    - Unwind a sufficient length of cord to allow for the bailer to travel to the bottom of the well.
    - Remove an additional length of cord and tie it securely to the well head to serve as a safety line for the bailer.

5. When raising the bailer the cord is collected on the plastic sheeting.

6. Unless authorized otherwise, all purged groundwater is collected, containerized, and when possible, managed in an onsite treatment system. If an onsite treatment system is not available, options for management of the purge water will be based upon the results of analyses.

Pumps

There are circumstances when pumps are more effective purging devices than bailers. When pumps are used to purge wells, pumping will be done from the top of the water column and flow will be checked to ensure removal of the proper volume of water. Also, in some instances, pumps are the preferred means by which samples are to be extracted from monitoring wells.

There are several pumps which are used frequently for purging or sampling. These types include the peristaltic, bladder, and submersible pumps.

Peristaltic Pumps

Peristaltic pumps must be operated above ground next to the well and are limited to depths of 20 to 30 feet below ground surface. The following procedure describes the use of peristaltic pumps for purging and sample collection.

1. New Teflon lined or Polyethylene suction line is used on each well being purged. New silicone pump head tubing will also be used if the pump is utilized for sampling.

2. The type of tubing used to collect the sample will be contingent on the parameters of interest.

   - If conventional parameters are being analyzed, then standard polyethylene tubing is sufficient to collect the sample.

   - If volatile, semi-volatile, or metals parameter are the constituents of interest, Teflon or Teflon lined tubing is used to collect the sample.

3. The suction line should be lowered to a depth in the water column to assure continued collection should drawdown of the water column occur.

4. To determine the proper amount of water to be purged, the pumping rate should be measured in gallons per minute by recording the time required to fill a selected

volume of a calibrated bucket. Flow measurements should be performed three times on each well to obtain an average rate.

5. Monitor the pumping to ensure proper pump operation and assure continuous discharge. If drawdown occurs, lower the tubing deeper into the water column.

6. When the required amount of water is purged from each well allow for sufficient recovery before sampling.

7. All purge water is managed in a treatment system, if available, or other wise contained pending determination of appropriate management options. All tubing is dedicated for use at a particular well or properly containerized to be discarded following use.

Bladder Pumps

The bladder pump is a gas-operated positive displacement submersible well pump that uses inert compressed gas, e.g., nitrogen, to inflate an internal bladder which pumps water up the discharge line.

These pumps are used when large volumes of water must be purged from monitoring wells. Usually these pumps are used on wells with diameters of 2 inches or greater and wells with water level depths up to 180 feet.

The line assembly is dedicated for use on one well only. After use the tubing is wrapped, marked, and stored for future use or hung within the well to which it is dedicated.

The bladder pumps are primarily used to remove the required amount of water from the monitoring well prior to sampling.

1. Connect the line assembly to the pump by first attaching the security cable and then connecting the sample and gas lines.

2. Lower the pump down the well by unrolling the line off the spoon until the pump is located within the middle of the saturated section of the screened interval.

3. Secure the cable to hold the pump at the desired depth.

4. Connect the gas line to the control box. The discharge line should be secured within a container (e.g., 55 gallon drum) to collect the purged water.

5. Connect the gas supply to the control box and adjust the pressure according to the manufacturer's manual.

6. As noted, the tubing is used on one well only; after each sampling event it is packed and sealed, or hung within the inner casing of the well for storage for future use on that well.

Submersible Pumps

When wells are encountered which require excessive lift (depth to water is greater than 20 feet) or have diameters greater than 2 inches, submersible pumps may be used to purge the required amount of water.
When economically feasible the submersible pumps will be dedicated to each well. However, in most cases, this is not economically feasible, and the same pump must be used in several wells.

To reduce the potential of cross contamination during purging and sampling activities a sample order will be established based upon historical constituent concentration at all wells to be sampled during an event. Purging and sampling will be conducted in a general clean to dirty order. Additionally, the use of dedicated or disposable tubing will be employed whenever feasible to reduce cross contamination potential.

1. The submersible pump should be lowered to a depth in each well between the middle to bottom screened portion of each monitoring well. The safety line should be secured to the well casing.

2. Connect the power cord to the power source (generator) and turn on the pump.

3. Continue to monitor the pumping rate and lower the line if drawdown of the water column occurs.

4. If the well is pumped to dryness, cease pumping until a sufficient recovery has occurred to satisfy sample volume requirements. (Note: Allowing a submersible pump to operate under dry conditions will quickly destroy the pump's motor.)

5. After this period the pump should be re-started and the total discharge volume should be measured to determine the rate of recharge.

6. Collect all purged water and, if available, manage through the onsite water treatment system or otherwise contain until appropriate management options have been identified.

3.2 Groundwater Sampling

After water level recovery, the well should be sampled within 24 hours of completion of the purge event. Dedicated or disposable Teflon or polyethylene bailers, or pumps equipped with dedicated or disposable tubing should be used to collect each sample. The sampling technician should wear a clean pair of nitrile gloves for each well. If a bailer is being used to collect a groundwater sample, the bailer should be gently lowered into the well. If utilizing a three volume purge with a submersible pump, the flow rate should be decreased to limit off gassing of volatile constituents. If Low Flow purging is being used, flow rates must remain consistent during purge and sample collection. Samples will be collected in decreasing order of their volatility. This order is generally as follows:

- Volatile Organic Chemicals (VOC)
- Total Organic Halogens (TOX)
- Total Organic Carbon (TOC)
- Semivolatile Organics Chemicals (SVOC)
- Metals
- Total Phenols
- Cyanide
- Other chemical parameters
- Radionuclides

Samples collected for volatile organics should be carefully placed into 40 ml glass vials with Teflon septum lids. No air bubbles should be present in the vial after sealing the septum lid; if air bubbles are present, fill the vial more completely. Other common laboratory-provided sample bottles include polyethylene or clear glass for metals and amber glass for phenols and semi volatiles.

In situations where analysis of dissolved metals is required, field filtration of each sample will be necessary (Note: filtering is not recommended for VOC or SVOC analysis).

Filtering is performed using either hand vacuum pumps with funnels or peristaltic pumps with disposable funnels/filters. If using the vacuum pump method, a laboratory cleaned funnel is used for each well. Funnels are decontaminated in the laboratory using the standard decontamination procedures. If using a peristaltic pump, new silicone tubing is used in the pump head for each sample filtered and new Teflon tubing is used from the pump head to the filter. Whether using a vacuum pump or peristaltic pump, all samples are filtered through inline 0.45 micron filters or equivalent. After filtering, samples requiring preservatives are preserved and all containers are securely placed in coolers and chilled to an appropriate temperature (usually $< 4^{o}C$). Each cooler containing samples; will contain a completed chain-of-custody form or tag.

#104
SAMPLING EQUIPMENT DECONTAMINATION

#104 - SAMPLING EQUIPMENT DECONTAMINATION

1.0 SCOPE AND PURPOSE

This Standard Operating Procedure (SOP) presents methods for on-site decontamination of field sampling equipment. Decontamination is performed as a quality assurance measure and a safety precaution. Decontamination prevents cross-contamination between samples and also helps to maintain a clean working environment for the safety of the field personnel.

Although this SOP defines on-site decontamination procedures, it is highly recommended that (1) dedicated disposable sampling implements are used whenever possible, and (2) sufficient dedicated sampling implements are taken to the field so that the need for field decontamination is eliminated or reduced. For example, in collecting groundwater samples, dedicated, disposable bailers should be used, where practicable.

Decontamination is mainly achieved by washing and rinsing with liquids which include; soap and/or phosphate-free detergent solutions, tap water, distilled water, acetone, hexane, and nitric acid. The actual procedure will vary depending on project-specific requirements as listed in the Quality Assurance Project Plan (QAPjP), the type of equipment to be used, and the analytical parameters of interest.

2.0 REQUIRED MATERIALS[1]

- Distilled water;
- Phosphate-free detergent (e.g., Liquinox, Alconox)
- Potable water supply;
- Hexane;
- Acetone;
- Isopropanol;
- 10% Nitric acid;
- Paper towels;
- Cleaning brushes;
- Aluminum foil;
- Gloves;
- Safety glass;
- Protective clothing;
- Cleaning containers (e.g., buckets, pans); and
- Dedicated squirt bottles for each solvent above and/or distilled water.

[1] Depending on project-specific requirements, not all materials may be necessary.

3.0 METHODOLOGY

It is the primary responsibility of the field team leader to assure that the proper decontamination procedures are followed. Project-specific decontamination procedures are to be included in the field SAP. It is the responsibility of the project safety officer (or designee) to develop and implement safety measures which provide protection for all persons involved directly with decontamination.

The contaminants encountered and type of equipment used will dictate the type of field decontamination procedures required. At a minimum, the following procedures will be used:

- Remove adhered material from the sampling equipment by brushing and/or rinsing with tap water;
- Wash with non-phosphate detergent and distilled water;
- Rinse with distilled water;
- Rinse with appropriate solvent[2], if organic constituents are of interest;
- Rinse with 10% nitric acid, if metals are a constituent of interest;
- Rinse with distilled water; and
- Air dry or dry with clean paper towels.

Safety Precautions

At a minimum, eye protection, safety shoes, and gloves are to be worn. There are several types of gloves that may be worn, depending on equipment being cleaned, type and extent of equipment contamination, and cleaning solutions or solvents being used.

Nitrile gloves may be worn when the equipment to be decontaminated is not heavily coated with constituents such as tars/oils. In cases where heavy accumulations of tars/oils are present on the equipment, neoprene or similar chemically compatible gloves are recommended. If a potential for skin contact exists, protective clothing should be worn.

[2] Note the specific solvent will be dictated by project-specific requirements.

4.0 QA/QC PROCEDURES

To insure that sampling equipment is cleaned properly, and does not lead to cross-contamination of samples, field rinsate blanks will be collected (if required by the applicable SAP). A rinsate blank will consist of pouring or pumping deionized organic-free water over the specific sampling device or through the device after it has been cleaned. The rinsate sample is performed in the field and generally one rinsate blank is collected each day of sampling or at a rate of 1 per 20 for each parameter, which ever is less, for each matrix being sampled or for each type of sampling instrument decontaminated and reused per day. The rinsate samples are analyzed for the specific parameters of concern (for each matrix). Rinsate blanks are not required if dedicated sampling equipment is used. Additional quality assurance samples may be collected if deemed necessary by project specific requirements. All project specific quality assurance sampling will be defined in the sampling and analysis plan (SAP) or QAPjP prior to initiation of the field work.

5.0 RECORDING REQUIREMENTS

The field team leader will maintain a record of the decontamination procedures.

6.0 REFERENCES

United States Environmental Protection Agency, January 1991. *Compendium of ERT Groundwater Sampling Procedures.* EPA/540/P-91/007. Washington D.C.

U.S. EPA, Region IV, *Field Equipment Cleaning and Decontamination*, SESDPROC-205-R1, November 2007.

#106
FIELD LOG BOOK

#106 - FIELD LOG BOOK

1.0 SCOPE AND PURPOSE

This Standard Operating Procedure (SOP) presents procedures for proper documentation of site activities with respect to the daily field logbook and supplemental data collection sheets. Field logbooks are the primary source of documentation for site activities, and serve as legal record of all occurrences during those activities.

2.0 REQUIRED MATERIALS

The required materials for maintaining a field log book include a water-resistant, permanently bound *Rite in the Rain ALL-WEATHER ENVIRONMENTAL No. 550F notebook* (or equivalent) and a pen with permanent ink.

3.0 METHODOLOGIES

Pertinent information regarding the site and work procedures must be documented. Information recorded in the notebook should be noted with the date and time of entry. The following items are commonly included as logbook entries:

- Name and location of site;
- Date and time of arrival and departure;
- Name of person keeping log;
- Names and affiliations of project personnel;
- Sampling event description;
- Sampling methodology, sample numbers and volumes, description of samples, date and time of sample collection, and name of collector (Should be Referenced in the Field Log Book However, Field Data will be Recorded on Site Specific Data Sheets for inclusion in Monitoring Reports) ;
- Prevailing weather conditions;
- Out of Scope or Anomalous technical measurements and readings;
- Diagrams and sketches;
- Description of Equipment and Standard Calibration Solutions/Media used (Including Serial Numbers and Expiration Dates, Lot Numbers);
- List and descriptions of photographs; and,
- Equipment calibration information confirmation (Note that daily Calibration data for each individual piece of field equipment shall be documented on the Field Equipment Calibration Log Sheet for inclusion in Applicable Deliverables).

Information should be recorded in permanent ink for the legal record. The company name, address, and phone number should be entered at the beginning of the log book. The pages of the logbook should be numbered for ease of reference. Blank spaces should be single line striken, initialed and dated. All

notes should be written at the time of observation. Changes or deletions should be single line striken, initialed and dated by the individual making the change. At the end of each field day, the holder shall place a single diagonal line through any unused lines and sign in full their name and date across the line. The Field Team Leader or designee is to sign and date the final entry page of each field crew members notebook for each day on which entries were made to verify the day's activities.

4.0 QA/QC PROCEDURES

At the end of each day of field activities, the individual or individuals maintaining the field log book should review the notes for accuracy and completeness. **Corrections or deletions are to be single line striken, initialed and dated.**

5.0 DATA RECORDING AND MANAGEMENT

All field books shall contain the holder's name and contact information located on the first page in the spaces provided.

It is essential that a running activity log be maintained, indicating the times of activities and observations; recorded data be written in the form of tables with an appropriate title; and that diagrams be included to illustrate pertinent information. Log books should be labeled with a unique and sequential number assigned to a single field team member. Each dated entry made should contain a project name, number, location and date on the appropriate lines provided at the top of each page.

6.0 REFERENCES

Environmental Research Center, University of Nevada - Las Vegas, March 1989, Soil Sampling Quality Assurance User's Guide, EPA/600/8-89/046.

Fetter, C. W., 1994, Applied Hydrogeology, Macmillan College Press Publishing Company, New York, New York, 691 p.

U.S. EPA, September 1986, RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, OSWER-9950.1

U.S. EPA, Region IV, *Logbooks*, SESDPROC-010-R1, November 2007.

#114
SAMPLE HANDLING, PRESERVATION, PACKAGING, AND SHIPPING

#114 - SAMPLE HANDLING, PRESERVATION, PACKAGING, AND SHIPPING

1.0 SCOPE AND PURPOSE

This Standard Operating Procedure (SOP) describes the procedures associated with the handling, preservation, packaging, and shipment of environmental samples for laboratory analysis or testing. Environmental samples may consist of air, groundwater, surface water, sediments, soil, non-aqueous phase liquid (NAPL), sludges and/or absorbent media (i.e. wipe samples, puff tubes) . The objective of sample preparation, handling, packaging, and shipping protocols is to develop standard procedures which will preserve the integrity of the samples and minimize the potential for sample tracking errors, sample spillage or leakage, and/or sample container breakage. The field team leader is responsible for the implementation of the sample handling, preservation, packaging, and shipping requirements outlined in the project-specific sampling and analysis plan (SAP).

2.0 REQUIRED MATERIALS

Required materials may include the following:

- Sample containers (preserved, as necessary);
- Sample bottle labels;
- Chain-of-Custody forms;
- Sample cooler;
- Bubble wrap or other suitable packing material;
- ice;
- Shipping bills (Federal Express, Airborne, etc.);
- Custody Seals;
- Packaging tape; and,
- Zip lock plastic bags.

3.0 METHODOLOGIES

3.1 Sample Handling

Sample Containers

Sample containers and appropriate preservatives (where necessary) will be supplied by the analytical laboratory. After the respective sample containers have been filled with appropriate sample media and preserved as necessary, samples will be properly identified using sample container labels, and the samples will be stored at an appropriate temperature (usually <4°C) to preserve the integrity of the samples.

Sample Preservation

Preservatives will be supplied by the laboratory. Where possible, preserved containers should be supplied by the lab. Common preservatives include hydrochloric acid (HCl), sulfuric acid (H_2SO_4), nitric acid (HNO_3), or sodium hydroxide (NaOH). Samples will be preserved in accordance with EPA protocol specified in SW-846 or the project specific protocols outlined in the quality assurance project plan (QAPjP). Use of the preservatives will be noted on the COC for each particular sample and analytical parameter.

Sample Labels

Ssample labels will be supplied by the analytical laboratory and affixed to the sample container. Sample labels will be completed using waterproof permanent markers or ink. The labels will be filled out at the time of sample collection by the field sampling personnel. Following application of the completed bottle labels, clear packing tape will be used to seal each label to the appropriate bottle. The following identifying sample information will be included on the label:

- Client/Site;
- Sample identification alpha-numeric code;
- Sample collector's initials;
- Date and time (military) of sample collection;
- Preservative;
- Analytical method; and,
- Laboratory analysis to be performed.

Chain-of-Custody Forms

A chain-of-custody (COC) record will be established and maintained to document sample possession from the time of collection until receipt by the laboratory. Once samples are received by the laboratory, they will be handled under the laboratory internal COC procedures. Field sampling personnel will initiate a COC record by recording the following minimum data as the samples are collected:

- Client/Site;
- Name(s) of sampler(s);
- Sample identification alpha-numeric code;
- Date and time (military) of sample collection;
- Type of sample (e.g., soil, groundwater);
- Number of containers per sample location;
- Requested analyses;

- Type of containers and preservatives used;
- Name and address for the completed laboratory reports;
- Name and address for the laboratory invoices; and,
- Specific instructions/notes for the laboratory, as necessary.

Completed COC forms will be placed in waterproof plastic bags and taped to the underside of the cooler lids. Sample COC forms will generally be supplied by the subcontracting analytical laboratory.

Subsequently, at each change of possession, the COC record will be signed by the person relinquishing the samples and by the person receiving the samples. The date and time of the transfer of possession of the sample will be recorded on the COC form; this occurs when the samples are transferred from the sampling personnel to the courier and when the samples are received at the analytical laboratory. Sample COC forms shall be completed in ink. Any transcription errors shall be corrected by striking the erroneous information with a single horizontal line. The correct information will be added immediately adjacent to the strikeout. The sampler should initial and date the correction. (Refer to SOP #105 for additional information). All blank spaces are to be single line stricken and a full signature of the executing crew member placed across the line and dated.

3.2 Sample Packaging and Shipping

All samples will be transported to the analytical laboratory in durable, waterproof, secured metal or plastic coolers. Sample coolers will generally be supplied by the laboratory. All samples will be packaged very carefully to prevent sample breakage. Samples will be shipped *via* overnight carrier (*e.g.*, Federal Express, Airborne, United Parcel Service) or hand delivered to the analytical laboratory, generally within 48 hours of collection. However, project specific protocols will be checked to assure that specified sample holding times are not exceeded in the event that samples are not shipped on the same day that they were collected. Additionally, the sample security and preservation must be maintained if samples are not to be transported immediately to the laboratory. The following procedure should be followed for packaging samples for shipment to the laboratory for testing and/or analysis.

1. Line the sample cooler with a cooler liner or clean heavy duty drum liner. Place plastic bubble wrap matting or suitable material over the base and bottom corners of each cooler or shipping container.

2. Obtain a chain-of-custody record and enter all the appropriate information as discussed above. Chain-of-custody records will include complete information for each sample. One or more chain-of-custody records shall be completed for each cooler or shipping container as needed to manifest each sample.

3. Place bubble wrapping or other suitable material around glass bottles and enclose in a single Zip Lock bag. Place all bottles standing upright on the base of the cooler, taking care to leave room for packing ice or equivalent. Rubber bands or tape may be used to secure wrapping completely around each sample bottle.

4. Place cold packs or ice in heavy duty "zip-lock" type plastic bags, **Ice is to be double bagged**, and distribute ice pillows down the center of the cooler as well as over the top of the samples. Add additional bubble wrap and/or Styrofoam pellets or other packing materials to fill the balance of the cooler or container.

5. If shipping the samples by express, courier, or delivery service, sign the chain-of-custody record thereby relinquishing custody of the samples. The date and time of custody transfer should be recorded on the chain-of-custody form. The custody transfer should be documented when directly transferring custody to a receiving party or when transmitting to a shipping service for subsequent receipt by the analytical laboratory. The shipping service should not be asked to sign chain-of-custody records.

6. Remove the last copy from the chain-of-custody record and retain with the field records. Place the original and remaining copies in a "zip-lock" type plastic bag and tape the bag to the underside of the lid of the cooler or shipping container.

7. Close the top or lid of the cooler or shipping container and with another person gently rotate the container to verify that the contents are packed so that they do not move. Improve the packaging if needed and reclose.

8. Packaging tape should be wrapped entirely around the sample shipping containers. A minimum of two full wraps of packaging tape will be placed in at least two places on the cooler or shipping container. Place a custody seal on the sample shipping containers. Sign and date the custody seal tape.

9. When transporting samples by automobile to the laboratory, and where periodic changes of ice are required, the cooler should only be temporarily closed so that reopening of the cooler can be easily performed. In these cases, chain-of-custody will be maintained by the person transporting the samples and chain-of-custody tape need not be used. If the cooler is to be left unattended, then chain-of-custody procedures should be implemented.

10. If shipment is required, transport the cooler to an overnight express package terminal or arrange for pickup. Obtain copies of all shipment records as provided by the shipping service.

11. Upon receipt of the samples, the analytical laboratory will open the cooler or shipping container and will sign "received by laboratory" on each chain-of-custody form. The laboratory will verify that the chain-of-custody tape has not been broken previously and that the chain-of-custody tape number corresponds with the number on the chain-of-custody record. The analytical laboratory will then forward the back copy of the chain-of-custody record to the sample collector to indicate that sample transmittal is complete.

4.0 QUALITY CONTROL

Quality control samples such as rinsate blanks and duplicates will be specified by the project QAPjP. A sample jar containing water should be sent as a temperature blank with each sample shipment requiring temperature preservation to ensure proper temperature is maintained. Also, a trip blank, provided by the laboratory will accompany shipments with samples intended for volatile organic chemical (VOC) analysis. Note that each separate crew od samplers will be required to submit a Trip Blank specific to the wells that particular crew sampled each day. Trip Blanks should be numbered and details recorded in the field note book indicating which sample locations are associated with a particular Trip Blank.

5.0 DATA RECORDING/MANAGEMENT

The documentation for supporting the sample handling, preservation, packaging and shipping will consist of chain-of-custody records, shipping records laboratory reports. In addition, a description of sample packaging procedures will be written in the Field Log Book. All documentation will be retained in the project files.

6.0 REFERENCES

U.S. Environmental Protection Agency, 1986. *RCRA Groundwater Monitoring Technical Enforcement Guidance Document.* OSWER-9950.1. September 1986.

U.S. Environmental Protection Agency, 1986. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* SW-846 3rd Edition (with revisions).

U.S. Environmental Protection Agency, 1987. *A Compendium of Superfund Field Operations Methods, Part 1*. EPA/540/P-87/001. December 1987.

U.S. Environmental Protection Agency, 1991. *Compendium of ERT Groundwater Sampling Procedures.* EPA/540/P-91/007. January 1991.

#116
DEPTH TO GROUNDWATER AND NAPL MEASUREMENTS

116 - DEPTH TO GROUNDWATER AND NAPL MEASUREMENTS

1.0 SCOPE AND PURPOSE

This Standard Operating Procedure (SOP) describes procedures to be followed for determining groundwater level measurements as well as a description of the procedures to be followed for determining the depth to any non-aqueous phase liquid (NAPL) in monitoring wells, and the apparent thickness of the NAPL layers in monitoring wells.

Generally, water level measurements from boreholes, piezometers, or monitoring wells are used to construct potentiometric surface maps and product elevation maps. Product levels and thickness and water levels should generally be taken in a 24-hour period unless certain situations necessitate measurements be taken in shorter time intervals.

2.0 REQUIRED MATERIALS

The following list identifies the preferred types of materials to be used when measuring depth to water, depth to light NAPL (LNAPL), or depth to dense NAPL (DNAPL):

- Electronic water level meter for water level measurements only;
- Interface probe (suitable for groundwater, LNAPL and DNAPL measurements);
- Field Note Book and/or site specific gauging forms;
- Appropriate PPE (i.e. Nitrile gloves, safety glasses, hard hat, steel toed boots);
- Plastic bucket with sealable lid for containerizing decon fluids;
- Second plastic bucket outfitted with a liner for solid consumables;
- Decontamination solutions in dedicated squirt bottles; and,
- Paper towels.

3.0 METHODOLOGY

Depth to Groundwater Measurements

- Open the well and monitor the headspace with the appropriate monitoring instrument to determine the presence of volatile organic compounds if there is information to suggest that volatiles may be present at levels to warrant an upgrade in the level of PPE. This activity will be conducted at least once per year unless specified otherwise in specific site control documents. Head space screening data will be recorded on the appropriate site specific gauging data sheets.

- Locate the surveyed measuring point of the well. The surveyed measuring point location is typically the top of the inner well riser, and should be clearly marked in permanent ink on the well riser or identified in previous sample collection records. The measuring point

location should be described in the Field Notes and should be the same point used for all subsequent measurements.

- To obtain a water level measurement, lower a decontaminated water level meter into the monitoring well. Care must be taken to assure that the water level measuring device hangs freely in the monitoring well and is not adhering to the wall of the casing. The water level measuring tape will be lowered into the well until the audible sound of the unit is detected or the light on an electronic sounder illuminates. At this time, the precise measurement should be determined (to the nearest 0.01') by repeatedly raising and lowering the tape to converge on the exact measurement. The water level measurement will then be entered in the Field Notes.

- The water level measuring device shall be decontaminated in accordance with SOP #104 immediately after use. Generally, only that portion of the measuring tape which penetrates the water table will require decontamination. If NAPL is encountered, use of a solvent (*e.g.*, acetone) will be required to clean the probe.

NAPL Measurements

NAPL measurements should be made using an interface probe. Interface probes are commonly used to detect the presence of any floating (LNAPL) or sinking (DNAPL) immiscible layers. These probes can also be used to measure the water levels inside wells.

- Using the grounding cable attached to the interface probe, ground the probe to a metal object (*i.e.*, protective steel locking well cover) to prevent electric shock.

- The probe should be lowered slowly inside each well. When LNAPL is detected, the probe will make a solid tone. Record the measurement from the surveyed point on the top of the well casing to the top of the LNAPL. Continue lowering the probe (observing the calibrated drop line) until the steady tone stops. When water is detected, the probe will emit an intermittent audible sound to signify the beginning of the water column. When the intermittent tone is heard, observe the calibrated drop line to determine the water level. Record this measurement. The measurement on the drop line between when the steady tone began (*i.e.*, LNAPL was encountered) and when it stopped (*i.e.*, groundwater was encountered) will determine the apparent thickness of the LNAPL layer.

- The depth to DNAPL can also be determined using the interface probe. Lower the probe through the water column to the bottom of the well. The probe will make a solid tone if a DNAPL is encountered. Record the depth to the top of the DNAPL layer, and the depth to the bottom of the well to determine the apparent thickness of the DNAPL layer.

- The NAPL measuring device should be thoroughly cleaned after each use in accordance with SOP #104. If NAPL is encountered, use of a solvent (*e.g.*, acetone) will be required to clean the probe.

4.0 QA/QC PROCEDURES

Quality control measures include repetitive measurements of the depth to water or NAPL to ensure that accurate and precise results are obtained. Once the measuring device indicates that the water level or NAPL layer has been encountered, the probe should be raised slightly and lowered several times to check and confirm the measurement. A single final reading should be recorded in the field notes or on the project specific form. Site specific gauging sheets contain the previous round of groundwater, NAPL and total depth measurements. Field crew members are to compare readings to assure structural integrity of the monitoring point as well as confirm the well identification. If readings are grossly (> 5%) different from the previous round of measurements, a second reading will be taken and recorded as such on the appropriate field data sheets and/or field log book.

Water levels in piezometers and monitoring wells should be allowed to stabilize for a minimum of 24 hours after well construction and development, prior to measurement. Note that various states have different requirements for the stabilization time required following well installation and development. Consult the Project Manager or Site Supervisor when newly installed wells are being gauged and/or sampled to confirm enough time has elapsed between installation/development and gauging activies. Also, measurements should always be taken from the least to the most contaminated wells while decontaminating the equipment between each well. Assure that you have been provided a current gauging an sample collection order during the Pre-job meeting prior to mobilization to the work site.

If water level data are to be used for groundwater flow direction determination, all measurements should be taken within the shortest time frame feasible.

5.0 DATA RECORDING OR MANAGEMENT

Proper field data collection and management is important. Data may either be entered into a bound field notebook or other form specified in a site-specific work plan. All erroneous data entries are to be single line striken, initialed and dated by the party making the correction in the field.

6.0 REFERENCES

United States Environmental Protection Agency, January 1991. *Compendium of ERT Groundwater Sampling Procedures.* EPA/540/P-91/007. Washington D.C.

United States Environmental Protection Agency, September 1986. *RCRA Groundwater Monitoring Technical Enforcement Guidance Document.* EPA/OSWER/9950.1. Washington D.C.

U.S. EPA, Region IV, *Groundwater Level and Well Depth Measurement*, SESDPROC-105-R1, November 2007.

#122
MANAGEMENT OF
INVESTIGATION DERIVED WASTES

#122 - MANAGEMENT OF INVESTIGATION DERIVED WASTES

PURPOSE

This standard operating procedure (SOP) presents general guidelines for the management of investigation derived wastes (IDWs), such as, but not limited to the following:

- Drill cuttings generated during soil boring investigations or well installations;
- Drilling fluids generated during soil boring investigations or well installations;
- Groundwater generated during well development, monitoring well purging, aquifer testing (i.e., pumping tests), or remedial activities;
- Water and sediment generated during equipment decontamination;
- Used personal protective equipment; and,
- Miscellaneous debris (e.g., well construction materials generated through abandonment of monitoring wells).

Due to the wide range of materials which may be generated and the variety of situations which may arise, it is likely that these SOPs will need to be supplemented with project-specific procedures. Where project-specific procedures are necessary, they should be developed to be consistent with the general guidelines presented below. Determination of the need for and scope of the development of project-specific procedures, will be determined as part of the initial project planning.

CONTAINERIZATION

Project-specific requirements for containerization of waste materials will be developed during initial project planning. If applicable, this information may be presented in a project-specific waste management plan. Project-specific containerization requirements should be developed to be consistent with the general guidelines provided below.

1. All potentially impacted materials generated during any investigation or remedial activity must be containerized unless one of the exceptions described below under Item 10 apply. Unless directed otherwise by the client, containers (drums, frac tanks, roll-off boxes, etc.) are to be provided by the consultant or contractor.

2. All potentially impacted materials shall be placed in new or reconditioned 55-gallon (DOT-UN1A2) drums. All drums brought onsite must be clean and in sound condition, free of any rust, dents, holes, or other types of damage.

3. Various types of waste materials (e.g., soils, groundwater, PPE, etc.) must be containerized separately without exception. Additionally, dry and wet soils should be containerized separately, if feasible.

4. Materials generated from various plant process areas, which may require potentially different waste classifications, should be containerized separately. As an example, soils generated in the vicinity of a surface impoundment which managed sludge from the treatment of wastewater from wood treating operations that use creosote and/or pentachlorophenol (EPA Hazardous Waste K001) should be containerized separately from soils generated in a creosote drip track area (EPA Hazardous Waste F034). Likewise, materials generated at off-site locations should be managed separately from those generated on-site.

5. If possible, drums should be filled to approximately 90% capacity. As necessary, drums containing liquids should have enough freeboard to prevent rupture in the event of freezing.

6. Containers inside of containers are not permitted by waste management regulations. As a result, PPE must be placed directly into the drum. **Do not place PPE in a plastic bag and in turn place the plastic bag into a drum.** This constitutes a violation of waste management regulations. Similarly, all soil samples must be removed from jars or plastic bags and the jars crushed or plastic bags torn prior to being placed in a drum.

7. All lids and gaskets must be securely fastened prior to moving from one location to another. The consultant or subcontractor is responsible for transporting containers to an on-site temporary staging area as directed by the Facility Waste Management Director. Containers must be loaded, transported and unloaded in a safe manner.

8. The exterior of all containers must be thoroughly cleaned prior to staging. All mud, dirt or debris must be removed, with no exception. Waste management facilities will not accept containers which are visibly dirty on the outside.

9. Under no circumstances shall non-waste materials or general trash be placed in waste containers. The consultant/subcontractor should provide a dumpster for management of non-waste materials and general trash.

10. Under certain circumstances, the following exceptions to the above requirements may be made if provided by regulations and state/federal concurrence:

    a. Some regulatory agencies may allow for all or a portion of generated materials (i.e., auger cuttings, drilling fluids) to be placed back into or onto the ground from which they were generated. The consultant is responsible for identifying these requirements.

    b. If an operating water treatment facility exists on-site, groundwater and/or decontamination liquids may be managed into the treatment system if the discharge permit for the treatment facility provides for management of those liquids, and the liquids do not contain materials (e.g., solids or oils) which could potentially effect the

operation of the system in an adverse manner. In this instance, consideration must be given to the classification and management of waste materials generated through the treatment of the liquid (e.g., spent activated carbon, filtered soils, etc.)

CONTAINER DESIGNATION AND LABELING

Project-specific requirements for container identification and labeling will be developed during initial project planning. If applicable, this information may be presented in a project-specific waste management plan. Project-specific container designation and labeling requirements should be developed to be consistent with the general guidelines provided below.

1. Each container will be assigned a unique designation. This designation should include a sequential number associated with each waste type, a code which identifies the type of waste (e.g., "S" for soil, "GW" for groundwater, etc.), and the date the material was placed in the container (e.g. 1-GW-12/12/98; 2-GW-12/12/98 etc...). The container designation must be clearly marked on the lid and the side of the container prior to transport to the temporary on-site staging area. The markings must be made in a manner such that the markings are legible, highly visible and permanent (i.e., weather resistant). A "Mean Streak®" grease pen or a paint stick is recommended for marking the container.

2. The appropriate waste classification label, as specified buy the site control documents, shall be affixed to the exterior side of the drum at a location at least two-thirds of the way up from the bottom of the container.

3. In the event the IDW waste stream has not yet be characterized, the Field team Leader will apply a "Contents Pending Analysis" label which will include information as specified in entry number 4 below.

4. The following information is to be recorded by field personnel in the field notebook and/pr on the IDW waste summary sheets, as appropriate.

    a. Container Designation;

    b. Contents (e.g., soil, groundwater, PPE);

    c. Date that the container was filled (i.e. start accumulation date);

    d. Location where the drums are staged;

    e. Location, and plant process area, where the material was generated (e.g., soil boring number, monitoring well designation);

f. Relative moisture content (e.g., dry, moist, damp, wet, saturated) for soils only, for the purpose of managing the materials for disposal, damp or moist soil are considered "liquid"; and ,

g. Approximate volume or percentage of the container filled.

CONTAINER STORAGE

Project-specific container storage requirements will be developed during the initial planning phase. If applicable, this information may be presented in a project-specific waste management plan. Project-specific container storage requirements should be developed to be consistent with the general guidelines provided below.

1. If the investigative or remedial work is conducted at active or inactive sites owned formerly by the consultant's client, plans for container storage must be developed in conjunction with the current property owner.

2. If containers are to be transported to an on-site staging area, all container handling and moving must be conducted in a safe manner. Contractors are responsible for providing the necessary equipment (e.g., front-end loader, fork lift with drum grappler, etc.) to provide for safe and efficient staging of containers.

3. All containers shall be stored in a neat and organized fashion with all labels clearly visible. Containers shall not be stacked.

4. Containers holding materials of different waste classifications should be staged together to facilitate loading of the materials onto transport vehicles.

5. To the extent practicable, all containers should be protected from the elements.

6. If stored outdoors in an area where precipitation could accumulate, all containers must be placed on pallets.

7. In accordance with DOT requirements, all containers must be rust-free and in sound condition for shipment.

8. Prior to demobilization, field personnel should conduct an inspection of the container storage area to ensure all containers are clearly marked, clean and staged in a neat and organized manner.

WASTE MATERIAL INVENTORY

FTS personnel are responsible for completing an inventory of waste materials stored at the project site. The inventory will be completed and submitted as part of the Field Trip Report.

Monthly the data is updated in the FTS waste management inventory located on the open share ORCA web site. The inventory will include a tabular summary of all containers stored at the project site and their respective contents as well as start accumulation dates for disposal planning and schedule.

WASTE MATERIAL SAMPLING AND ANALYSIS

Composite samples of the containerized materials for laboratory analysis may be collected for each IDW media. The results of the analysis may be used for waste profiling purposes required by the waste management facility and/or waste classification purposes. Project-specific requirements for waste sampling and analysis will be developed during initial project planning. If applicable, this information may be presented in a project-specific waste management plan. Project-specific waste material sampling and analysis requirements should be developed to be consistent with the standard procedures provided below. To the extent practicable, historical information, site-specific analytical data and knowledge of the waste composition should be utilized to minimize sampling and analysis requirements.

1. Specific details regarding the number and types of samples to be collected, required laboratory turn-around time, analytical parameters and analytical methods will be determined on a project-specific basis during the initial planning phase. If applicable, this information may be presented in a project-specific waste management plan.

2. At a minimum, samples must be collected and handled in accordance with standard industry protocols. If an approved project-specific Sampling and Analysis Plan or Quality Assurance Project Plan exists, then sample collection and handling procedures, as specified therein, must be followed.

3. All analyses must be performed using the appropriate analytical methods specified in EPA SW846 “Test Methods for the Evaluation of Solid Wastes”.

4. The sampler must complete and maintain copies of all chain-of-custody documentation.

5. In accordance with Subpart CC or 40CFR Par 264/265 which became effective on December 6, 1996, hazardous wastes containing greater than 500 parts per million by weight total volatile organic compounds (VOCs), are subject to the emission control requirements of this rule. Determination of VOC content may be made through laboratory analyses or generator knowledge. Thus, analysis for VOCs will likely be required by the waste disposal facility for profiling purposes in the future. Analysis is to be performed using method 25D in 40CFR Part 60 Appendix A, or through the use of an approved alternate method. Knowledge-based waste determinations must be thoroughly documented.

6. Composite samples of similar waste classification of containerized materials will be profiled based on the characteristics presented in 40 CFR Part 261 Subpart C - Characteristics of Hazardous Wastes:

   - §261.21 - Characteristic of Ignitability.
   - §261.22 - Characteristic of Corrosivity.
   - §261.23 - Characteristic of Reactivity.
   - §26124 - Toxicity Characteristic.

TRANSPORTATION AND DISPOSAL

Transportation, disposal, and manifesting of IDW are the responsibility of the owner.

ATTACHMENT A

EXAMPLE WASTE INVENTORY SUMMARY

ATTACHMENT A

Field & Technical Services

FTS

IDW INVENTORY LOG

Date:

Project Name:

Project Number:

Location:

Container Identification Number	Type of IDW (SW, GW, NAPL, PPE, Other)	Start Accumulation Date	Date Filled	Comment / Label Description	Staging Location

#128
GROUNDWATER FIELD TESTING

SOP 128 - GROUNDWATER FIELD TESTING

1.0 SCOPE AND PURPOSE

This Standard Operating Procedure (SOP) identifies general calibration, measurement, and decontamination procedures for common field testing equipment, including pH, specific conductance meters, Dissolved Oxygen meters and thermometers. Defining the procedures that are to be consistently implemented will promote project quality assurance and control measures.

Because certain field parameters (*e.g.*, pH, temperature) are sensitive to climatic effects, field testing is performed on water collected from the first sample aliquot extracted for analysis following purging (generally, this aliquot is split between the volatile organic sample bottles and the field parameters) to ensure that representative measurements are obtained to the extent practicable. Evaluation of various parameters in the field, specifically pH, specific conductance, dissolved oxygen, temperature and turbidity, can be used as a preliminary means of identifying potentially impacted areas and to assess changes in water chemistry, which may occur during purging. Measurement of turbidity may be a means of evaluating the adequacy of well development.

The site specific sampling plan may require that measurements of pH, specific conductance, and temperature be reported during purging of the well until these parameters are consistent. This helps to ensure that water representative of conditions in the saturated zone are present in the well prior to sampling. The procedures that follow are generic and are likely modified in the site specific sampling and analysis plan based on the project-specific requirements, the equipment to be used, or the preference of the state or federal agency providing regulatory oversight. For groundwater quality meters being used to measure parameters in the field, all operations, calibration and trouble shooting should be consistent with the manufacturers recommendations.

2.0 REQUIRED MATERIALS

Equipment and materials necessary for completing groundwater field testing include, at a minimum, the following:

- Multi parameter groundwater quality meter (i.e. Oakton 10 series, YSI 556 or equivalent);
- Fresh calibration solutions and calibration log sheets;
- Clean, plastic sample container or flow through cell (of appropriate size and depth to accommodate the specific probes);
- Appropriate PPE (i.e. Nitrile gloves, safety glasses, hard hat, steel toed boot);
- Sealable buckets for containerizing decon fluids and spent PPE;
- Spare set of batteries for each piece of equipment;
- Stop watch;
- Graduated containers for measuring volumes of purge water removed;

- Permanent marker, packing tape, zip lock bags, garbage bags, chemical free paper towels;
- Water recovery device such as a bailer or pump;
- Appropriate tubing, rope, fittings to facilitate purging;
- Disposal or transfer containers for IDW (i.e. 55 gal DOT approved steel drums, plastic buckets with gasket equipped lids);
- Previous gauging and purging information for the wells to be sampled;
- Current HASP and applicable site control documents detailing sampling protocol;
- Squirt bottle and supply of deionized or distilled water and phosphate-free detergent;
- Field notebook and/or applicable site specific groundwater purging and sample collection data sheets; and

3.0 METHODOLOGIES

Unless otherwise directed by the site sampling and analysis plan, FTS personnel should follow the procedures indicated below.

3.1 Calibration

All field testing equipment will be calibrated in accordance with the equipment manufacturers recommendations. The date, time, personnel conducting the calibration, equipment model, serial number, readings, and necessary adjustments will be documented on the equipment calibration sheet.

The Compendium of Superfund Field Operations Methods (Compendium), U.S. Environmental Protection Agency, 1987, suggests recalibration at each well location; this suggestion may be employed on a site-specific basis. If there appears to be an equipment malfunction or if readings are other than expected, recalibration will be performed. If recalibration does not appear to bring the unit back to within historical ranges of monitored parameters, consult the manual for trouble shooting activities or contact the manufacturer for help diagnosing the malfunction. If the issue can not be resolved in the field, the unit will be tagged for repair and a replacement unit used for completing the event. All malfunctions will be documented in the field note book as well at the purge and sample collection sheet associated with the well at which the anomalous readings were noted.

- **Horiba** - The Horiba field meter, which simultaneously measures pH, specific conductance, turbidity, temperature, dissolved oxygen, and salinity, is calibrated using one prepared solution that is provided by the equipment rental company.

- **Oakton 10 Series** – The Oakton 10 Series multi parameter groundwater meter monitors for Temp, pH and Conductivity. The buffer solutions, one 4, 7 and 10 pH buffer solution will be used for calibration. The conductivity will be calibrated using a 1409µs buffer solution.

- **YSI 556** – The YSI 556 is a multi parameter water quality meter that monitors temp, pH, conductivity, dissolved oxygen and oxygen reducing potential. The unit can be equipped with a probe guard for down-hole and surface water applications or installed in a flow thru cell for Low Flow applications. The buffer solutions, one 4, 7 and 10 pH buffer solution will be used for calibration. The conductivity will be calibrated using a 1409µs buffer solution.

- **La Motte 2020 or 2020e Turbidity Meter** – The LaMotte 2020 and 2020e turbidity meters monitor only turbidity of water samples. Both LaMotte units are calibrated using manufacture prepared calibration standards of 0, 1, and 10 NTU.

3.2 Measurement

If field parameter measurements are performed during well purging to evaluate the representativeness of the groundwater for sampling, the first testing is performed at the beginning of the initial volume removed from the well and subsequent testing is performed at completion of removal of the first, second, and third well volumes purged (in some cases, removal of four or five well volumes may be required by the sampling plan).

If field parameters have stabilized to within the prescribed variances as specified on the Groundwater Purging and Sample Collection log sheet after three well volumes have been removed (or the minimum required by the sampling plan), purging may be discontinued; if conditions have not stabilized, purging should be continued and the water quality evaluated at each additional well volume removed until the field parameters have stabilized or a total of five (5) well volumes has been purged. Turbidity is normally the last parameter to stabilize, it is permissible to allow a well to settle following purge if all other parameters have stabilized but turbidity readings are elevated. Sample collection should not exceed 24hrs from completion of purge.

The water to be tested should be placed in a clean, plastic container and readings obtained immediately in the following order:

- Temperature;
- pH;
- Specific conductance, and;
- Turbidity (separate glass vial for LaMotte meter).

Monitoring equipment must produce stable readings prior to recording a field measurement to insure data quality. All field parameter data is to be compared against historical data in the field during collection to assure consistency of data and/or to identify a malfunctioning piece of equipment which is producing erroneous data.

3.3 Decontamination

Between samples, the sampling probe on any multi parameter groundwater quality meter should be thoroughly rinsed with distilled, deionized water. The glass vial used for measuring turbidity with the LaMotte meter should also be rinsed between reading to prevent particulate carryover.

4.0 DATA RECORDING OR MANAGEMENT

Documentation of field measurement activities should be recorded in the project field notebook (SOP # 106). The field book should serve as the primary reference for field data and observations; recorded on site specific field forms.

All data should be recorded at the time of measurement. Information to be recorded should include, at a minimum, the following information:

- Project and site identification;
- Weather conditions;
- Date and personnel present and performing measurements;
- Listing of equipment, including name, model and serial numbers;
- Calibration procedures and results for each piece of equipment;
- Equipment malfunctions;
- Measurement results; and
- Any factors which may have an effect on the project and/or the measurements being collected.

#157
LOW-FLOW (MINIMAL DRAWDOWN) GROUNDWATER SAMPLING PROCEDURES

SOP #157 LOW-FLOW (MINIMAL DRAWDOWN) GROUNDWATER SAMPLING PROCEDURES

1.0 SCOPE AND PURPOSE

This standard operating procedure (SOP) provides guidelines for the collection of representative groundwater samples from monitoring wells. Groundwater samples are typically collected from monitoring wells for laboratory analysis to support the characterization of representative groundwater quality. Low-flow purging has the advantages of minimizing the turbidity and mixing between the overlying stagnant casing water and water within the screened interval. Low-flow refers to the velocity with which water enters the pump intake and that is imparted to the formation pore water in the immediate vicinity of the well screen. Water level drawdown provides the best indication of the stress imparted by a given flow-rate for a given hydrological situation. Typically, flow rates on the order of 0.1-0.5 liter/minute are used, however, these flow rates may be varied dependent upon site-specific hydrogeology.

2.0 REQUIRED MATERIALS

The following list identifies the types of equipment which may be used during groundwater sampling tasks. Project-specific equipment should be selected based upon project objectives, the depth of groundwater, purge volumes, analytical parameters, and well construction. The types of groundwater sampling equipment are as follows:

- Purging/Sample Collection Equipment

    - Low-flow (e.g., 0.1-0.5 liter/minute) pumps such as peristaltic pumps; bladder pumps, electrical submersible pumps, and gas-driven pumps;
    - Pumps are to be constructed of stainless steel or Teflon™;
    - (Note that bailers are inappropriate devices for low-flow sampling.)

Peristaltic pumps may be the least desirable choice, and for some projects, may not be an option at all. Some regions have specific requirements regarding what type of pumps should be used for sampling of particular analytical parameters. For example, USEPA Region II does not allow the use of peristaltic pumps for collecting samples for analysis of organic parameters. For this reason, region-specific requirements regarding pump selection shall be specified in the project-specific work plan. Another consideration is the soft silicon tubing required for use with the peristaltic pump mechanism. There is potential that this tubing may react with more complex organic compounds.

- Related sampling and field measurement equipment will include some or all of the following:

- A multi-parameter measurement unit with in-line sampling capability such as a Horiba® U-10 or U-22;
- A photoionization detector (PID) to monitor for volatile organic constituents upon opening the monitoring well cap (the need for this instrument will be specified in the project specific work plan)
- An in-line dissolved oxygen meter;
- An in-line turbidity meter;
- An in-line filtration apparatus, 0.45 m or 0.1 m, if dissolved metals are a constituent of interest at the site;
- A water level meter; and,
- An interface probe, if light non-aqueous phase liquid (NAPL) or dense NAPL are potentially present on site (the need for this instrument will be specified in the project-specific work plan).

- General Equipment:

  - Safety Glasses or equivalent eye protection;
  - Distilled water and dispenser bottle;
  - Decontamination solutions (such as Alconox and solvents);
  - Field data sheets and log book;
  - Sample preservation solutions;
  - Sample containers;
  - Buckets and intermediate containers;
  - Coolers;
  - Shipping labels;
  - Permanent markers/pens;
  - Packing tape;
  - First aid kit;
  - Key(s) for well locks; and,
  - Stopwatch.

- Disposable Materials:

  - Plastic sheeting/bags;
  - Pump tubing;
  - Gloves;
  - Filters;
  - Chemical-free paper towels; and,
  - Protective coveralls (e.g., Tyvek), if necessary.

3.0 METHODOLOGIES

3.1 Pre-Sampling Considerations

Water samples should not be collected immediately following well development. Sufficient time should be allowed for the groundwater flow regime in the vicinity of the monitoring well to stabilize and to approach chemical equilibrium with the well construction materials. This lag time will depend on site conditions and method of installation. New Jersey protocols require a minimum lag time of two weeks. USEPA protocols recommend an evaluation of site conditions with a typical minimum time lag of one week. (Note: Project personnel shall review applicable regulatory guidelines regarding the required lag time on a project-specific basis).

Several preparatory activities need to be completed prior to actual sampling of each well. These preparatory activities can be summarized as follows:

- Log in sample bottles received from laboratory, prepare any deionized water or preservatives needed for the sampling;

- If necessary, prepare pumps with standard decontamination procedures;

- Don the necessary personnel protective equipment (PPE) stipulated in the Site health and safety plan (HASP);

- Measure static water level prior to well purging. Water levels may be measured to the nearest hundredth of a foot with an electronic probe from the established measuring point of the well casing. If water levels will be used to determine groundwater flow direction and/or hydraulic gradients, all measurements should be collected over as short a time period as possible. Water level measurements will be consistent with the procedures specified in FTS SOP #116, Depth to Groundwater Measurements.

- Unless specified otherwise in the project-specific Field Sampling Plan (FSP), well depth should be obtained from the well logs, rather than from measuring total depth, as this activity may disturb material that has settled to the bottom of the well and increase turbidity in samples. If it is necessary to measure total depth, or to measure dense non-aqueous phase liquid (DNAPL), perform these measurements after the sample has been collected.

3.2 Equipment Calibration

Prior to purging and sampling, all sampling devices and monitoring equipment should be calibrated according to manufacturer's recommendations and the site Quality Assurance Project Plan (QAPP) and FSP. Dissolved oxygen calibration must be corrected for local barometric pressure readings and elevation.

3.3 Well Purging

For low-flow, minimal drawdown sampling protocols, an in-line water quality measurement device such as a flow-through cell is used to establish the stabilization time on a well-specific basis for several indicator parameters, as follows:

- pH;
- specific conductance;
- dissolved oxygen;
- turbidity; and,
- Oxidation-Reduction Potential (ORP) (as required on a project-specific basis).

This differs from the general guideline used in conventional purging and sampling protocols that requires removal of a minimum of three casing volumes prior to sampling. Following are recommendations to be considered before, during, and after purging and sampling:

- establish a flow rate that maintains minimal drawdown in the well during both purging and sampling;
- maximize tubing wall thickness and minimize tubing length;
- place the sampling device intake at the middle or slightly above the middle of the screened interval, unless specified otherwise in the project-specific work plan
- For wells completed as open boreholes in bedrock, placement of the sampling device will be specified in the project-specific work plan;
- minimize disturbances of the stagnant water column above the screened interval during water level measurement and sampling device insertion;
- make proper adjustments to stabilize the flow rate as soon as possible;
- monitor water quality indicators during purging.

PUMP SELECTION

There are no unusual requirements for groundwater sampling devices when using low-flow, minimal drawdown techniques. The primary requirement is that the device give consistent results and minimal disturbance of the sample across a range of low flow rates (i.e., <0.5 liter/minute). Note that pumping rates that cause minimal to no drawdown in one well could easily cause significant drawdown in another well that has been installed in a less transmissive formation. Consistency in operation is critical to meet accuracy and precision goals.

There are several pumps which are used frequently for purging or sampling. These types include the peristaltic, bladder, and submersible pumps. It is desirable that the pump be easily adjustable and operates reliably at these lower flow rates. Gas-driven pumps should be of a type that does not allow the gas to be in direct contact with the sampled fluid. Bailers and other grab-type samplers are not suited for low-flow sampling and shall not be used.

Bladder Pumps

The bladder pump is a compressed air or gas-operated, positive displacement submersible well pump that uses inert compressed gas, e.g., nitrogen, to inflate an internal bladder which pumps water up the discharge line. These pumps are used when large volumes of water must be purged from monitoring wells or when water depths exceed the limits of a peristaltic pump. Usually these pumps are used on wells with diameters of 2 inches or greater and wells with depths up to 150 feet. When economically feasible the bladder pumps will be dedicated to each well. The line assembly is dedicated for use on one well only. After use, the tubing is wrapped, marked, and stored for future use in the well to which it is dedicated.

The following procedures should be followed for using the bladder pump:

1. Connect the line assembly to the pump by first attaching the cable and then connecting the sample and gas lines.

2. Lower the pump down the well by unrolling the line off the spool until the pump is located at the desired position inside the well.

3. Secure the cable to hold the pump at the desired depth.

4. Connect the gas line to the control box. The discharge line should be connected to the water quality meter or flow-through cell, with cell discharge line placed into a container (e.g., 5-gallon bucket or 55-gallon drum) to collect the purged water.

5. Connect the gas supply to the control box and adjust the pressure according to the manufacturer's manual.

6. As noted, the tubing is used on one well only; after each sampling event it is packed, sealed, and stored for future use on that well.

Submersible Pumps

When wells are encountered which require excessive lift (depth to water is greater than 20 feet) or have diameters greater than 2 inches, positive displacement submersible pumps may also be used to purge the required amount of water. When economically feasible, the submersible pumps will be dedicated to each well. However, in some cases, this is not economically feasible, and the same pump must be used in several wells. When this must be done, the pumps will be appropriately decontaminated between wells. Also, a pump will be used on wells known to contain similar constituent levels, or used first in wells with lower constituent levels before use in wells suspected to contain higher constituent concentrations.

1. The submersible pump should be lowered to the desired depth using a safety line that is secured to the well casing.

2. Connect the power cord to the power source (generator) and turn on the pump.

3. Connect the discharge line to the water quality meter or flow-through cell, with cell discharge line placed into a container (e.g., 5-gallon bucket or 55-gallon drum) to collect the purged water.

4. Continue to monitor the pumping rate and water level in the well, slowing the rate if drawdown occurs.

Peristaltic Pumps

Peristaltic pumps must be operated above ground next to the well and are limited to water level depths of 20 to 30 feet below ground surface. The following procedure describes the use of peristaltic pumps for purging and sample collection.

1. New Nalgene or low density polyethylene (LDPE) suction line is used on each well being purged. New silicone pump head tubing will also be used if the pump is also used for sampling.

2. The type of tubing used to collect the sample will be contingent on the parameters of interest.

    - If conventional parameters (i.e., biological oxygen demand [BOD], total suspended solids [TSS], fecal coliform, pH, and oil and grease) are being analyzed, then standard Nalgene tubing is sufficient to collect the sample.

    - If volatile, semi-volatile, or metals parameters are the constituents of interest, Teflon™ tubing is used to collect the sample.

3. Unless authorized otherwise, all purged groundwater is collected, containerized, and when possible, managed in an onsite treatment system. All tubing is discarded after each use or dedicated to future use within the same well.

3.4 Monitoring or Water Level and Water Quality Indicator Parameters

Performance criteria for determining stabilization should be based on water-level drawdown, pumping rate, and equipment specifications for measuring indicator parameters. Check the water level periodically during purging and sampling to monitor drawdown in the well as a guide to flow rate adjustment. The goal is minimal drawdown (<0.1 meter) during purging. This goal

may not be possible to achieve under some circumstances and may require adjustment based on site-specific conditions and personal experience.

In-line water quality indicator parameters should be continuously monitored during purging, as follows:

- temperature;
- pH;
- ORP;
- conductivity,
- dissolved oxygen; and,
- turbidity.

Measurements should be taken every three to five minutes. Stabilization is achieved after all parameters have stabilized for three successive readings. The three successive reading should be within the following guidelines to indicate stabilization:

- constant temperature;
- ± 0.2 s.u. for pH;
- ± 3% for conductivity;
- ± 10 mv for ORP;
- <10 NTU or Stable,
- ± 10% for dissolved oxygen.

Note that these are guidelines only; for example, in those instances where the field parameters measure at very low quantities, even minor fluctuations can exceed the guidelines, even though stabilization has been achieved. In these instances, the field technician must use professional judgment to determine that parameter stabilization has been achieved.

Parameters will typically stabilize in the following order: pH, temperature, and specific conductance, followed by ORP, dissolved oxygen, and turbidity. If parameter stabilization criteria are too stringent, then minor oscillations in indicator parameters may cause purging operations to become unnecessarily protracted. It should also be noted that turbidity is a very conservative parameter in terms of stabilization and is normally the last parameter to stabilize. Excessive purge times are invariably related to the establishment of too stringent turbidity stabilization criteria. Note that natural turbidity levels in groundwater may exceed 10 nephelometric units (NTU). Pumping rate, drawdown, and the time or volume required to obtain stabilization of parameter readings can be used as a future guide to purge the well.

3.5 Groundwater Sampling

Once parameters have stabilized, begin sample collection as soon as possible. Disconnect or bypass the in-line monitoring device that was used to measure field parameters prior to sample collection. The sampling flow rate should remain at the established purge rate or may be adjusted slightly to minimize aeration, bubble formation, turbulent filling of sample bottles, or loss of volatiles due to extended residence time in tubing. Typically, flow rates <0.5 liters/minute are appropriate. The same device used for purging should be used for sampling. Samples will be collected in decreasing order of their volatility. This order is generally as follows:

- Volatile organic chemicals (VOCs);
- Total organic halogens (TOX);
- Gas sensitive parameters (e.g., Fe2+, CH4, H2S/HS-, alkalinity);
- Total organic carbon (TOC);
- Semivolatile organics chemicals (SVOCs);
- Inorganic parameters; and,
- If filtered samples are to be collected, these should be collected last.

Samples collected for volatile organics should be carefully placed into 40 milliliter glass vials with Teflon septum lids. No air bubbles should be present in the vial after sealing the septum lid; if air bubbles are present, fill the vial more completely. Other common laboratory-provided sample bottles include polyethylene or clear glass for metals and amber glass for phenols and SVOCs.

If the FSP or QAPP specifies dissolved metals analysis, field filtration of each sample will be necessary. Filtering is performed using an in-line filtration device, hand vacuum pumps with transfer vessels, or peristaltic pumps with disposable funnels/filters. If using the vacuum pump method, a laboratory cleaned transfer vessel is used. If using a peristaltic pump, new silicone tubing is used in the pump head for each sample filtered and new Teflon tubing is used from the pump head to the filter. Samples are filtered through 0.45 micron filter unless specified otherwise in the FSP. After filtering, samples requiring preservatives are preserved and all containers are securely placed in coolers and chilled to an appropriate temperature (usually < 4oC). Each cooler containing samples will contain a completed chain-of-custody form.

Sampling technicians should wear a clean pair of disposable gloves for each well.

4.0 QA/QC PROCEDURES

Quality control requirements depend upon project-specific circumstances and objectives and should be addressed in the QAPP or FSP.

5.0 DATA RECORDING AND MANAGEMENT

A written record of each monitoring event must be maintained. The record provides a summary of the sample collection procedures and conditions, shipment method, the analyses requested and the custody history. This record consists of the following:

- Field notebook;
- Groundwater Sample Collection Form;
- Chain of custody form; and,
- Shipping receipts.

Sample labels shall be completed at the time each sample is collected and will include the information listed below.

- Project name;
- Sample number;
- Time and date;
- Preservative (if applicable);
- Analyses to be performed; and,
- Sampler's name.

6.0 REFERENCES

U.S. EPA, Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, by Robert W. Puls and Michael J. Barcelona, EPA/540/S-95/504, April 1996.

U.S. EPA, Region II, Ground Water Sampling Procedure - Low Flow Pump Purging and Sampling.

U.S. EPA, Region IV, *Groundwater Sampling*, SESDPROC-301-R1, November 2007.

LaMotte 2020e Calibration Instructions

Turbidity Standards

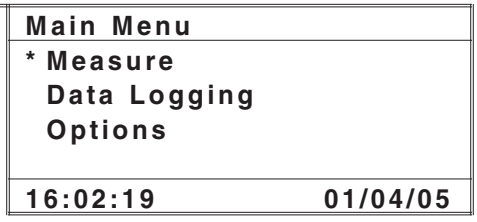
Only use AMCO or formazin standards with the 2020. StablCal® standards below 50 NTU should not be used to calibrate the 2020. The diluent used in StablCal® standards has a different refractive index than traditional formazin standards and will affect the results. The concentration of the calibration standard should be similar to the expected concentration of samples that will be tested. The following standards are available from LaMotte Company:

1480	0 NTU Standard, 60 mL (EPA and ISO)
1484	1 NTU Standard, 60 mL (EPA)
1481	1 NTU Standard, 60 mL (ISO)
1485	10 NTU Standard, 60 mL (EPA)
1482	10 NTU Standard, 60 mL (ISO)
1486	100 NTU Standard, 60 mL (EPA)
1483	100 NTU Standard, 60 mL (ISO)

CALIBRATION PROCEDURE

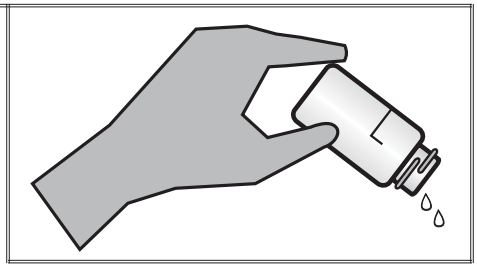
1. Press ***ION** to turn the meter on.

2. Press ***IOK** to select **Measure**.

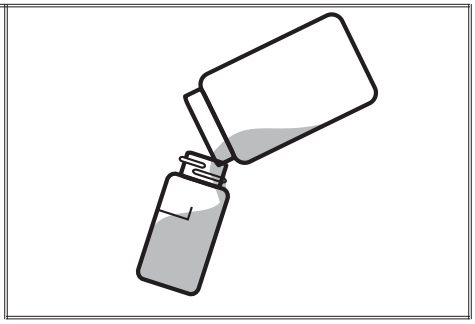


3. Rinse a clean tube (0290) three times with the blank.

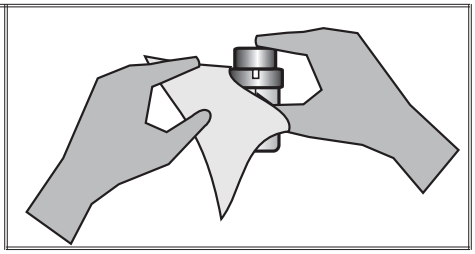
   Below 1 NTU – The meter should be blanked with a 0 NTU Primary Standard or prepared turbidity-free (<0.1 NTU) water. For the most accurate results, use the same tube for the blank and the sample.



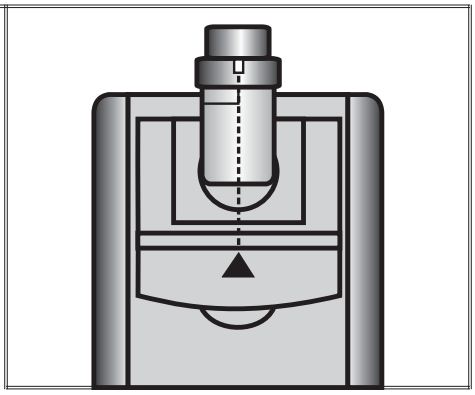
4. Fill the tube to the fill line with the blank. Pour the blank down the inside of the tube to avoid creating bubbles. Cap the tube.



5. Dry the tube with a lint-free cloth. Put on a dry positioning ring. Cap the tube. Wipe the tube thoroughly again with a lint-free cloth.

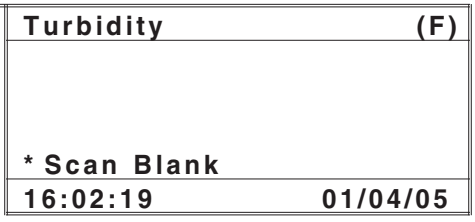


6. Open the meter lid. Insert the tube into the chamber. Align the index notch on the positioning ring with the index arrow on the meter. Close the lid.

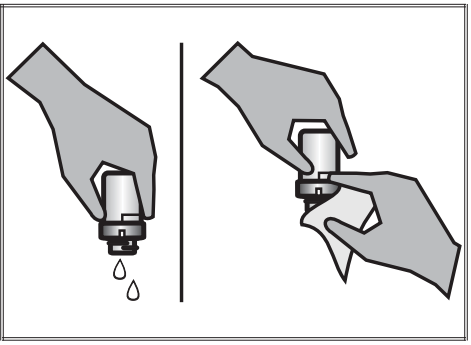


7. Press ***I OK** to select **Scan Blank**. Remove the tube.

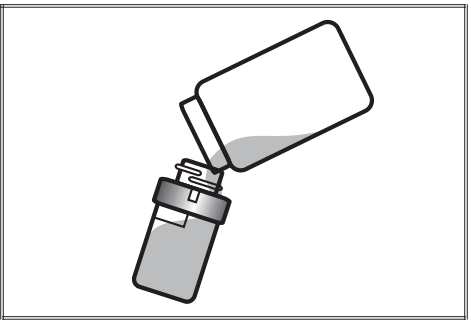
   NOTE: For the best accuracy, especially at low level turbidity, see **Tip 17** on page 43.



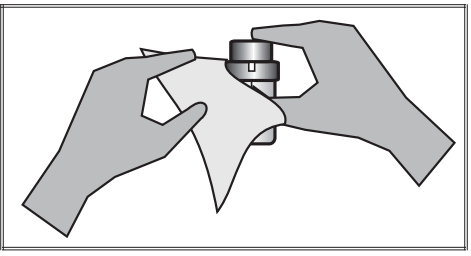
8. Rinse a clean tube (0290), or the same tube, three times with the standard. Avoid spilling standard on the outside of the tube.
IMPORTANT: While the tube is inverted, wipe the lip of the tube to remove droplets of liquid that may be present. This will prevent liquid from being trapped under the ring when the tube is returned to an upright position.



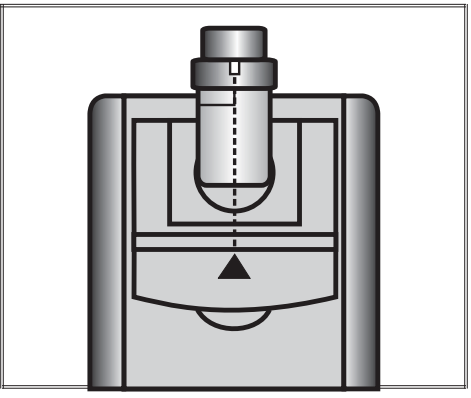
9. Fill the tube to the fill line with the standard. Pour the standard down the inside of the tube to avoid creating bubbles. Cap the tube.



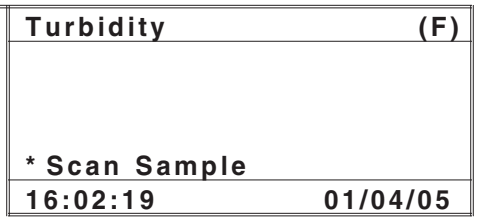
10. Wipe the tube thoroughly again with a lint-free cloth.



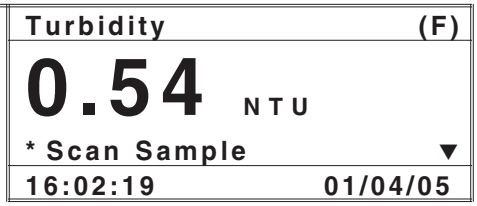
11. Open the meter lid. Insert the tube into the chamber. Align the index notch on the positioning ring with the index arrow on the meter. Close the lid.



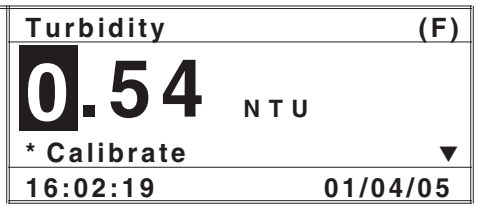
12. Press ***IOK** to select **Scan Sample**.



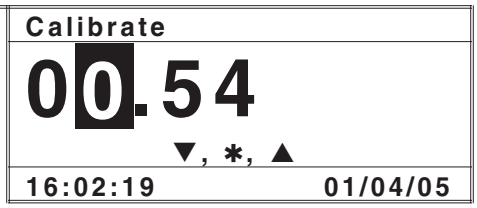
13. Observe the result.

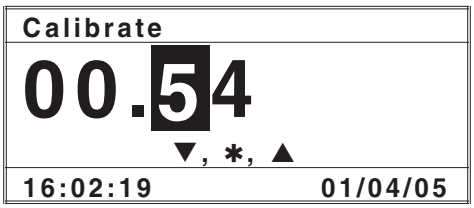


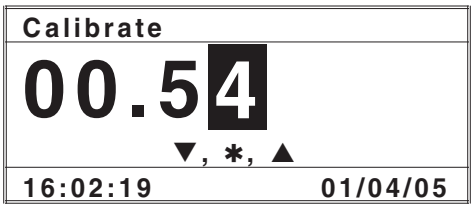
14. Press ▼ and then press ***IOK** to select **Calibrate**.

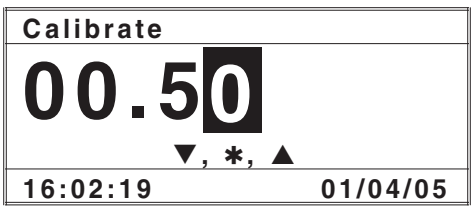


15. Use the ▼ or ▲ to change the highlighted digits on the display to match the concentration of the turbidity standard. Press ***IOK** to accept a digit and move to the next digit.









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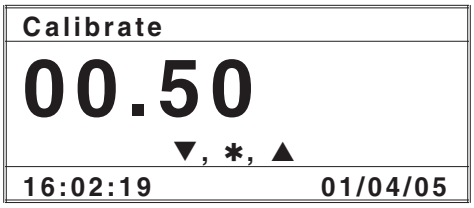
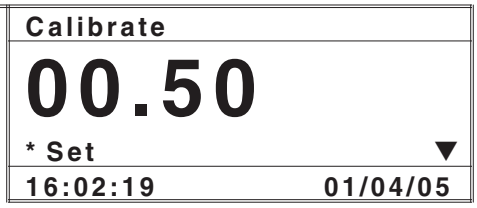
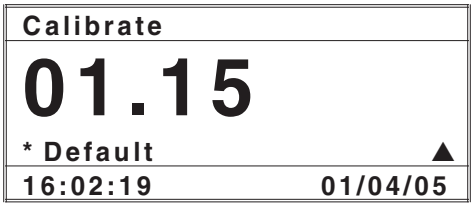


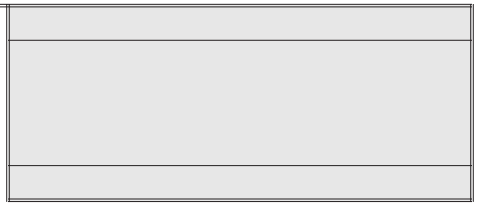
16. When the value on the display matches the concentration of the turbidity standard, press the ***IOK** to select **Set**.



Or press ▼ press ***IOK** to return the meter to the default setting.



17. Press ***IOK** to proceed to Turbidity analysis. Press **OFF** to turn the meter off or press ◀ to exit to a previous menu or make another menu selection.



Note: The meter will remember the last scanned blank reading. It is not necessary to scan a blank each time the test is performed. To use the previous blank reading, instead of scanning a new one, scroll to Scan Sample and proceed. For the most accurate results, the meter should be blanked before each test and the same tube with tube positioning ring should be used for the blank and the reacted sample.

YSI 556 Calibration Instructions

6. Calibrate

All of the sensors, except temperature, require periodic calibration to assure high performance. You will find specific calibration procedures for all sensors that require calibration in the following sections. If a sensor listed is not installed in your probe module, skip that section and proceed to the next sensor until the calibration is complete.

⚠ **CAUTION:** Reagents that are used to calibrate and check this instrument may be hazardous to you health. Take a moment to review *Appendix D Health and Safety*. Some calibration standard solutions may require special handling.

6.1 Getting Ready to Calibrate

6.1.1 Containers Needed to Calibrate the Probe Module

The transport/calibration cup that comes with your probe module serves as a calibration chamber for all calibrations and minimizes the volume of calibration reagents required.

Instead of the transport/calibration cup, you may use laboratory glassware to perform calibrations. If you do not use the transport/calibration cup that is designed for the probe module, you are cautioned to do the following:

- ✓ Perform all calibrations with the Probe Sensor Guard installed. This protects the sensors from possible physical damage.
- ✓ Use a ring stand and clamp to secure the probe module body to prevent the module from falling over. Most laboratory glassware has convex bottoms.
- ✓ Ensure that all sensors are immersed in calibration solutions. Many of the calibrations factor in readings from other sensors (e.g., temperature sensor). The top vent hole of the conductivity sensor must also be immersed during some calibrations.

6.1.2 Calibration Tips

1. If you use the Transport/Calibration Cup for dissolved oxygen (DO) calibration, make certain to loosen the seal to allow pressure equilibration before calibration. The DO calibration is a water-saturated air calibration.

2. The key to successful calibration is to ensure that the sensors are completely submersed when calibration values are entered. Use recommended volumes when performing calibrations.

3. For maximum accuracy, use a small amount of previously used calibration solution to pre-rinse the probe module. You may wish to save old calibration standards for this purpose.

4. Fill a bucket with ambient temperature water to rinse the probe module between calibration solutions.

5. Have several clean, absorbent paper towels or cotton cloths available to dry the probe module between rinses and calibration solutions. Shake the excess rinse water off of the probe module, especially when the probe sensor guard is installed. Dry off the outside of the probe module and probe sensor guard. Making sure that the probe module is dry reduces carry-over contamination of calibrator solutions and increases the accuracy of the calibration.

6. If you are using laboratory glassware for calibration, you do not need to remove the probe sensor guard to rinse and dry the sensors between calibration solutions. The inaccuracy resulting from simply rinsing the sensor compartment and drying the outside of the guard is minimal.

7. If you are using laboratory glassware, remove the stainless steel weight from the bottom of the probe sensor guard by turning the weight counterclockwise. When the weight is removed, the calibration solutions have access to the sensors without displacing a lot of fluid. This also reduces the amount of liquid that is carried between calibrations.

8. Make certain that port plugs are installed in all ports where sensors are not installed. It is extremely important to keep these electrical connectors dry.

6.1.3 Recommended Volumes

Follow these instructions to use the transport/calibration cup for calibration procedures.

- ✓ Ensure that a o-ring is installed in the o-ring groove of the transport/calibration cup bottom cap, and that the bottom cap is securely tightened.

  NOTE: Do not over-tighten as this could cause damage to the threaded portions.

- ✓ Remove the probe sensor guard, if it is installed.
- ✓ Remove the o-ring, if installed, from the probe module and inspect the installed o-ring on the probe module for obvious defects and, if necessary, replace it with the extra o-ring supplied.
- ✓ Some calibrations can be accomplished with the probe module upright or upside down. A separate clamp and stand, such as a ring stand, is required to support the probe module in the inverted position.
- ✓ To calibrate, follow the procedures in the next section, Calibration Procedures. The approximate volumes of the reagents are specified below for both the upright and upside down orientations.
- ✓ When using the Transport/Calibration Cup for dissolved oxygen % saturation calibration, make certain that the vessel is vented to the atmosphere by loosening the bottom cap or cup assembly and that approximately 1/8" of water is present in the cup.

Sensor to Calibrate	Upright	Upside Down
Conductivity	55ml	55ml
pH/ORP	30ml	60ml

Table 6.1 Calibration Volumes

6.2 Calibration Procedures

6.2.1 Accessing the Calibrate Screen

1. Press the **On/off** key to display the run screen.
2. Press the **Escape** key to display the main menu screen.
3. Use the arrow keys to highlight the **Calibrate** selection.

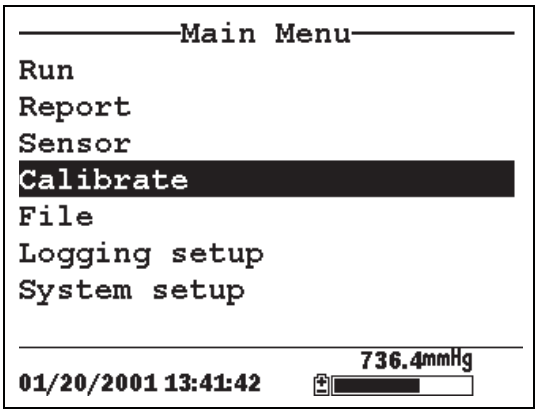


Figure 6.1 Main Menu

4. Press the **Enter** key. The Calibrate screen is displayed.

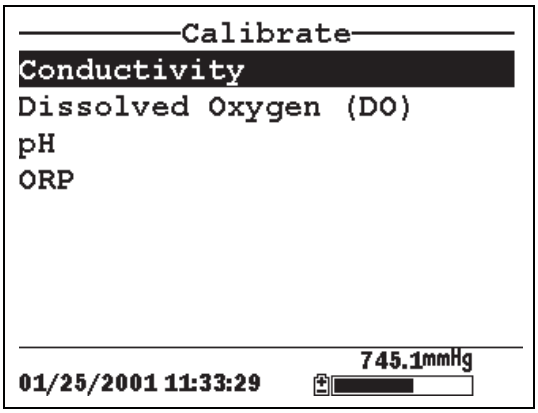


Figure 6.2 Calibrate Screen

6.2.2 Conductivity Calibration

This procedure calibrates specific conductance (recommended), conductivity and salinity. Calibrating any one option automatically calibrates the other two.

1. Go to the calibrate screen as described in Section 6.2.1 Accessing the Calibrate Screen.

2. Use the arrow keys to highlight the **Conductivity** selection. See Figure 6.2 Calibrate Screen.

3. Press **Enter.** The Conductivity Calibration Selection Screen is displayed.

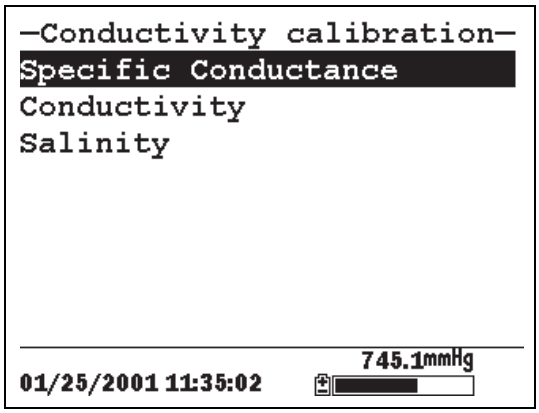


Figure 6.3 Conductivity Calibration Selection Screen

4. Use the arrow keys to highlight the Specific Conductance selection.

5. Press **Enter.** The Conductivity Calibration Entry Screen is displayed.

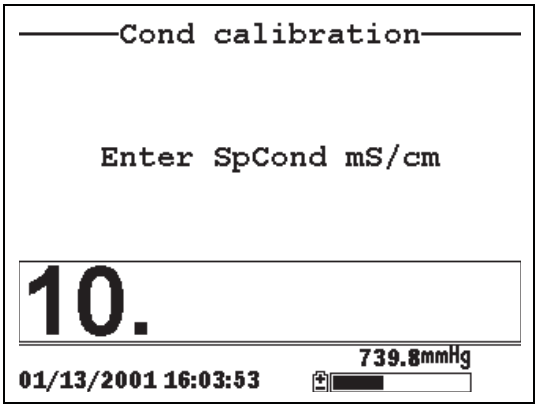


Figure 6.4 Conductivity Calibration Entry Screen

6. Place the correct amount of conductivity standard (see Table 6.1 Calibration Volumes) into a clean, dry or pre-rinsed transport/calibration cup.

⚠ **WARNING**: Calibration reagents may be hazardous to your health. See *Appendix D Health and Safety* for more information.

NOTE: For maximum accuracy, the conductivity standard you choose should be within the same conductivity range as the samples you are preparing to measure. However, we do not recommend using standards less than 1 mS/cm. For example:

- ✓ For fresh water use a 1 mS/cm conductivity standard.
- ✓ For brackish water use a 10 mS/cm conductivity standard.
- ✓ For seawater use a 50 mS/cm conductivity standard.

NOTE: Before proceeding, ensure that the sensor is as dry as possible. Ideally, rinse the conductivity sensor with a small amount of standard that can be discarded. Be certain that you avoid cross-contamination of solutions. Make certain that there are no salt deposits around the oxygen and pH/ORP sensors, particularly if you are employing standards of low conductivity.

7. Carefully immerse the sensor end of the probe module into the solution.

8. Gently rotate and/or move the probe module up and down to remove any bubbles from the conductivity cell.

NOTE: The sensor must be completely immersed past its vent hole. Using the recommended volumes from Table 6.1 Calibration Volumes, should ensure that the vent hole is covered.

9. Screw the transport/calibration cup on the threaded end of the probe module and securely tighten.

NOTE: Do not overtighten as this could cause damage to the threaded portions.

10. Use the keypad to enter the calibration value of the standard you are using.

NOTE: Be sure to enter the value in **mS/cm at 25°C**.

11. Press **Enter**. The Conductivity Calibration Screen is displayed.

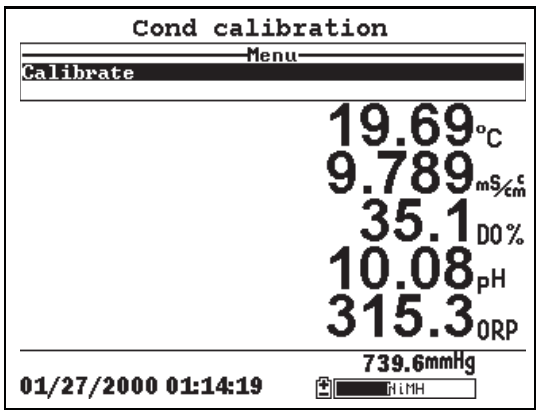


Figure 6.5 Conductivity Calibration Screen

12. Allow at least one minute for temperature equilibration before proceeding. The current values of all enabled sensors

will appear on the screen and will change with time as they stabilize.

13. Observe the reading under Specific Conductance. When the reading shows no significant change for approximately 30 seconds, press **Enter**. The screen will indicate that the calibration has been accepted and prompt you to press **Enter** again to Continue.

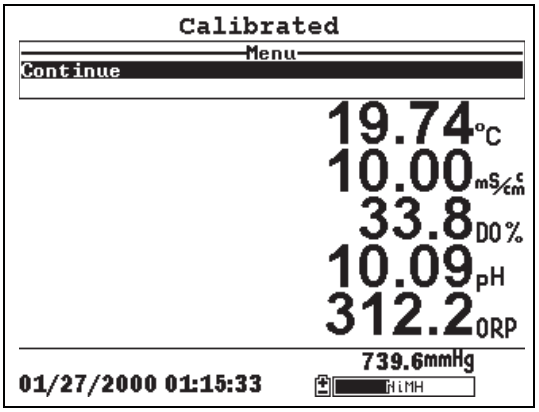


Figure 6.6 Calibrated

14. Press **Enter**. This returns you to the Conductivity Calibrate Selection Screen, See Figure 6.3 Conductivity Calibration Selection Screen.

15. Press **Escape** to return to the calibrate menu. See Figure 6.2 Calibrate Screen.

16. Rinse the probe module and sensors in tap or purified water and dry.

6.2.3 Dissolved Oxygen Calibration

This procedure calibrates dissolved oxygen. Calibrating any one option (% or mg/L) automatically calibrates the other.

1. Go to the calibrate screen as described in Section *6.2.1 Accessing the Calibrate Screen.*

NOTE: The instrument must be on for at least 20 minutes to polarize the DO sensor before calibrating.

2. Use the arrow keys to highlight the **Dissolved Oxygen** selection. See Figure 6.2 Calibrate Screen.

3. Press **Enter**. The dissolved oxygen calibration screen is displayed.

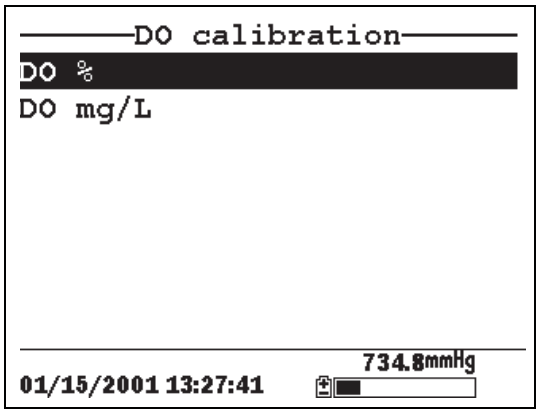


Figure 6.7 DO Calibration Screen

DO Calibration in % Saturation

1. Use the arrow keys to highlight the DO% selection.

2. Press **Enter**. The DO Barometric Pressure Entry Screen is displayed.

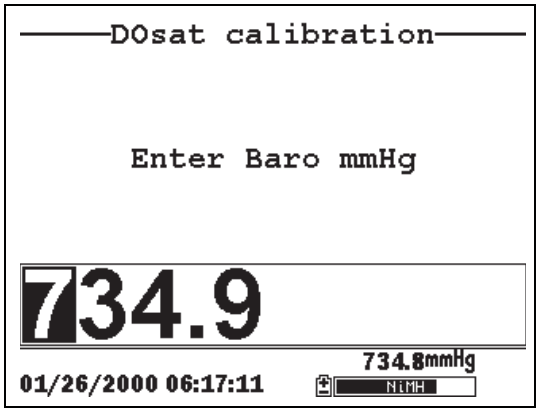


Figure 6.8 DO Barometric Pressure Entry Screen

3. Place approximately 3 mm (1/8 inch) of water in the bottom of the transport/calibration cup.

4. Place the probe module into the transport/calibration cup.

   NOTE: Make sure that the DO and temperature sensors are **not** immersed in the water.

5. Engage only 1 or 2 threads of the transport/calibration cup to ensure the DO sensor is vented to the atmosphere.

6. Use the keypad to enter the current local barometric pressure.

   NOTE: If the unit has the optional barometer, no entry is required.

   NOTE: Barometer readings that appear in meteorological reports are generally corrected to sea level and must be uncorrected before use (refer to Section *10.10 Calibrate Barometer, Step 2*).

7. Press **Enter**. The DO% saturation calibration screen is displayed.

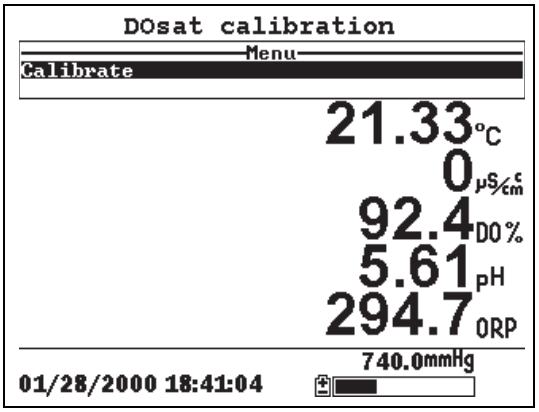


Figure 6.9 DO Sat Calibration Screen

8. Allow approximately ten minutes for the air in the transport/calibration cup to become water saturated and for

the temperature to equilibrate before proceeding. The current values of all enabled sensors will appear on the screen and will change with time as they stabilize.

9. Observe the reading under DO %. When the reading shows no significant change for approximately 30 seconds, press **Enter**. The screen will indicate that the calibration has been accepted and prompt you to press **Enter** again to Continue. See Figure 6.6 Calibrated.

10. Press **Enter**. This returns you to the DO calibration screen, See Figure 6.7 DO Calibration Screen.

11. Press **Escape** to return to the calibrate menu. See Figure 6.2 Calibrate Screen.

12. Rinse the probe module and sensors in tap or purified water and dry.

DO Calibration in mg/L

DO calibration in mg/L is carried out in a water sample which has a known concentration of dissolved oxygen (usually determined by a Winkler titration).

1. Go to the DO calibrate screen as described in Section *6.2.3 Dissolved Oxygen Calibration*, steps 1 through 3.

2. Use the arrow keys to highlight the **DO mg/L** selection.

3. Press **Enter**. The DO mg/L Entry Screen is displayed.

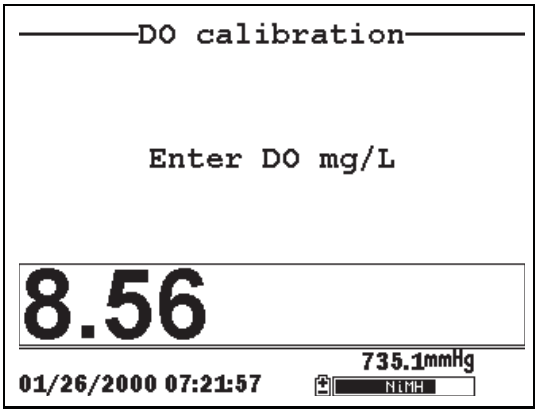


Figure 6.10 DO mg/L Entry Screen

4. Place the probe module in water with a known DO concentration.

NOTE: Be sure to completely immerse all the sensors.

5. Use the keypad to enter the known DO concentration of the water.

6. Press **Enter**. The Dissolved Oxygen mg/L Calibration Screen is displayed.

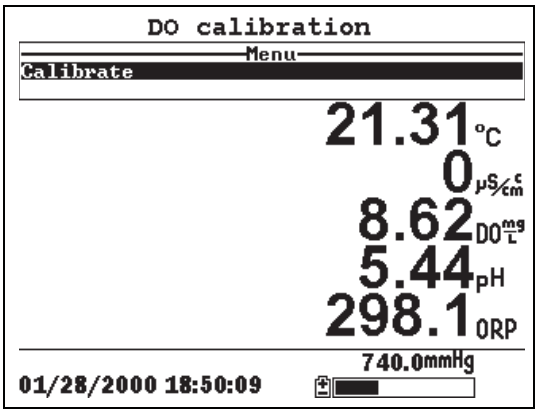


Figure 6.11 DO mg/L Calibration Screen

7. Stir the water with a stir bar, or by rapidly moving the probe module, to provide fresh sample to the DO sensor.

8. Allow at least one minute for temperature equilibration before proceeding. The current values of all enabled sensors will appear on the screen and will change with time as they stabilize.

9. Observe the DO mg/L reading, when the reading is stable (shows no significant change for approximately 30 seconds), press **Enter**. The screen will indicate that the calibration has been accepted and prompt you to press **Enter** again to Continue.

10. Press **Enter**. This returns you to the DO calibration screen. See Figure 6.7 DO Calibration Screen.

11. Press **Escape** to return to the calibrate menu. See Figure 6.2 Calibrate Screen.

12. Rinse the probe module and sensors in tap or purified water and dry.

6.2.4 pH Calibration

1. Go to the calibrate screen as described in *Section 6.2.1 Accessing the Calibrate Screen.*

2. Use the arrow keys to highlight the **pH** selection. See Figure 6.2 Calibrate Screen.

3. Press **Enter**. The pH calibration screen is displayed.

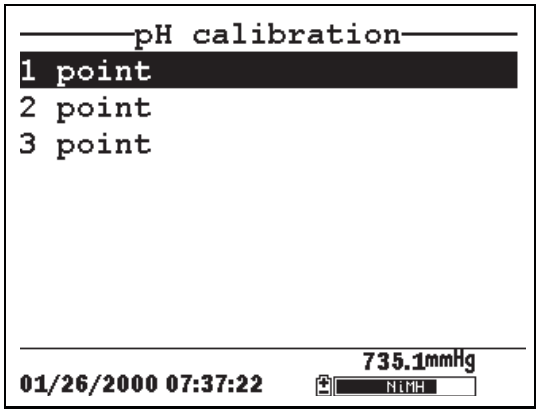


Figure 6.12 pH Calibration Screen

- Select the **1-point** option only if you are adjusting a previous calibration. If a 2-point or 3-point calibration has been performed previously, you can adjust the calibration by carrying out a one point calibration. The procedure for this calibration is the same as for a 2-point calibration, but the software will prompt you to select only one pH buffer.
- Select the **2-point** option to calibrate the pH sensor using only two calibration standards. Use this option if the media being monitored is known to be either basic or acidic. For example, if the pH of a pond is known to vary between 5.5 and 7, a two-point calibration with pH 7 and pH 4 buffers is sufficient. A three point calibration with an additional pH 10 buffer will not increase the accuracy of this measurement since the pH is not within this higher range.
- Select the **3-point** option to calibrate the pH sensor using three calibration solutions. In this procedure, the pH sensor is calibrated with a pH 7 buffer and two additional buffers. The 3-point calibration method assures maximum accuracy when the pH of the media to be monitored cannot be anticipated. The procedure for this calibration is the same as for a 2-point calibration, but the software will prompt you to select a third pH buffer.

4. Use the arrow keys to highlight the **2-point** selection.

5. Press **Enter**. The pH Entry Screen is displayed.

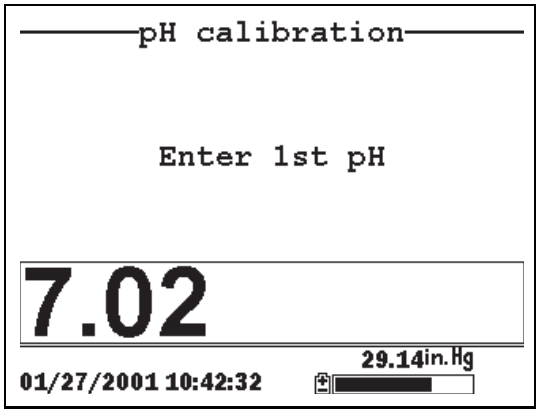


Figure 6.13 pH Entry Screen

6. Place the correct amount (see Table 6.1 Calibration Volumes) of pH buffer into a clean, dry or pre-rinsed transport/calibration cup.

⚠ **WARNING**: Calibration reagents may be hazardous to your health. See *Appendix D Health and Safety* for more information.

NOTE: For maximum accuracy, the pH buffers you choose should be within the same pH range as the water you are preparing to sample.

NOTE: Before proceeding, ensure that the sensor is as dry as possible. Ideally, rinse the pH sensor with a small amount of buffer that can be discarded. Be certain that you avoid cross-contamination of buffers with other solutions.

7. Carefully immerse the sensor end of the probe module into the solution.

8. Gently rotate and/or move the probe module up and down to remove any bubbles from the pH sensor.

NOTE: The sensor must be completely immersed. Using the recommended volumes from Table 6.1 Calibration Volumes, should ensure that the sensor is covered.

WESTBAY MULTI-PORT SYSTEM SAMPLING AND DECONTAMINATION PROCEDURES

WESTBAY MULTI-PORT SYSTEM SAMPLING AND DECONTAMINATION PROCEDURES

The Westbay Multi-Port System (Westbay System) is a multi-level sampling system that allow discrete groundwater samples to be collected from multiple intervals within a single monitoring well. Each interval is isolated with the use of packers to seal the well annulus between the monitoring zones. Each monitoring interval contains a measurement port and a pumping port. Sampling should be performed by a qualified individual trained in the operation of the Westbay System.

1.0 Westbay System Sampling Procedures

1.1 The sampling procedures outlined in this section are the same for each monitoring zone in every well. Within each monitoring interval, a measurement port is installed as part of the MP System. The measurement ports incorporate a valve in the wall of the coupling, with an alignment notch on the opposite, inside wall of the coupling.

1.2 The Westbay sampling probe (currently the MOSDAX Sampler Probe Model 2531), the Westbay MOSDAX Automated Groundwater Interface (MAGI), Westbay sample bottles, and laboratory supplied sample bottles are required to perform the sampling.

1.3 Review Westbay's as-built well diagrams to determine the depths of each monitoring zone and associated measurement ports for the well being sampled.

1.4 Assemble the tripod and wireline cable reel above the well, and attach the evacuation port coupling to the top of the MP System. Designate a location with a clean stable surface for handling the sample bottle string such that the bottles do not come in contact with the ground surface.

1.5 Using new disposable gloves, assemble the sample bottles (maximum of 4) using the wrenches provided in the Westbay kit to snug the connections between the sample bottles and the connector tubing. Confirm that the o-rings on the connector tubing are present and intact. Replace o-rings if necessary. Using the valve tool, close the valve on the bottom sampling tube, and open the valves between each bottle.

APPENDIX A: STANDARD OPERATING PROCEDURES

1.6 The sample bottles can now be attached to the sampling probe. The MAGI also needs to be connected to the sampling probe. Lastly, attach the MAGI to the battery source by clipping the red lead to the positive battery terminal and the black lead to the negative battery terminal. NOTE: It is important to connect the sampling probe to the MAGI prior to connecting the MAGI to the power source to avoid the potential for an electric shock to the sampling technician or an electrical surge to the MAGI.

1.7 The sampling probe and bottles are now ready to be placed in the monitoring well. Ensure the cable reel brake is on, and there is adequate slack in the wireline cable to maneuver the sampling train into the monitoring well without kinking the cable. Using the MAGI, activate the location arm on the sampling probe so it is in the extended position (the MAGI display should indicate 15 to 16 revolutions). Carefully lift the sampling train into the monitoring well, paying special attention to the connection between the wireline and sampling probe so as not to kink the wireline. Lower the sample bottles and probe until the location arm is firmly seated in the alignment notch of the evacuation collar.

1.8 Remove the slack from the wireline cable, and zero the reel counter.

1.9 With the sampling probe seated in the evacuation collar, the following Westbay surface function checks must be performed and recorded on the groundwater sampling form:

- Record the ambient pressure indicted by the MAGI. This pressure reading is required once per well, unless the well is being sampled over multiple days, in which case the ambient pressure should be recorded at the start of sampling on subsequent days.
- Activate the shoe. The shoe should extend and the MAGI display should indicate 16 to 19 revolutions (23 revolutions in open air outside of the evacuation collar).
- Close the sampler valve. The motor should run for approximately 5 seconds, and the MAGI display will indicate 1 revolution.
- Attach the vacuum pump to the fitting on the vacuum coupling. Note the pressure reading on the MAGI. Begin applying a vacuum with the vacuum pump. The MAGI display should maintain a constant pressure. If the pressure reading begins decreasing, inspect for leaks at the face seal of the probe, the connection to the pump, and the connection at the probe sampling valve. Repeat procedure as necessary to ensure seals and connections are secure.
- Open the sampler valve.

- Use the vacuum pump to apply a vacuum to the sample bottles. The vacuum should be applied until the pressure inside the sample bottles is below 4 pounds per square inch (psi) as displayed on the MAGI.
- Close the sampler valve. A vacuum has now been applied to the sample bottles.
- Retract the shoe.
- Confirm the cable reel brake is on and the reel counter has been zeroed. Retract the location arm.

1.10 The sampling probe and bottles can then be lowered into the MP System well. The sampling train should be lowered to the approximate sample depth, until the MAGI beeps indicating the sampling probe has reached the magnetic reference installed on the MP System (note that the beep system is not always reliable, so the depth readings show be monitored). Raise the sampling probe approximately 3 feet to ensure the sampling probe location arm is above the measurement port.

1.11 The location arm should then be activated, and the sampling probe and bottles can be lowered until the location arm is secured in the measurement port alignment notch. The depth on the wireline reel counter should be checked against the Westbay System as-built well diagram to verify the sample probe and bottles are at the correct measurement port.

1.12 When the sample probe and bottles are located at the correct measurement port, the following steps are required, including recording data on the groundwater sampling form:

- Tighten the brake on the cable reel.
- Record the pressure reading inside the casing as displayed on the MAGI.
- Activate the shoe, noting that a pressure change on the MAGI display should occur indicating a connection with the formation when the shoe is fully extended.
- Record the pressure reading of the formation as displayed on the MAGI.
- Open the sampler valve. NOTE: the pressure displayed on the MAGI will jump to a significantly lower reading due to the vacuum applied to the sample bottles. The pressure will then begin to climb as the sample bottles are filled with groundwater.
- Allow the sample bottles to fill with groundwater until the pressure displayed on the MAGI is the same as the formation pressure noted prior to opening the sampler valve. NOTE: The Westbay MOSDAX Sampler Probe Model 2531 pressure transducer has a reported accuracy of ± 0.25 %.

- Close the sampler valve.
- Retract the shoe.
- Record the pressure reading inside the casing as displayed on the MAGI. The pressure reading should be similar to the original casing pressure recorded prior to activating the shoe.
- Ensure there is no slack in the wireline cable, and the cable reel brake is applied. Retract the location arm, and retrieve the sample probe and bottles.

1.13 When the sampling probe reaches the top of the MP System, activate the location arm and seat the probe in the alignment notch of the evacuation coupling. Provide adequate slack in the cable so the probe will reach the designated bottle handling area without kinking the cable.

1.14 Paying special attention not to kink the wireline cable at the connection to the sampling probe, remove the sample probe and bottles from the monitoring well and lay out the unit on a split PVC casing or other clean, level surface.

1.15 Close each of the valves connecting the sample bottles. Each of the bottles can then be separated from the sampling train.

1.16 The sample bottles can then be used to fill laboratory-prepared sample containers. Hold the sample bottle vertically over the laboratory sample container, with the top of the bottle pointed away from the sampler's face. Slowly open the top valve to release the pressure from within the bottle. Close the top valve once the pressure has been released. The bottom valve can then be opened and the groundwater can be directed into the laboratory container.

1.17 Ice should be present during each sampling event, and samples are to be placed in a cooler with ice immediately after the samples are transferred from the Westbay bottles to the laboratory supplied bottles. In the event a laboratory bottle is only partially filled with the sample collected on a particular run, the laboratory bottle should be closed and placed in a cooler with ice until subsequent runs with the Westbay sampling probe and bottles are performed to complete the sample collection.

1.18 In the event multiple runs with the Westbay sampling probe and bottles are required to collect the full sample volume from a particular monitoring zone, the Westbay sampling

equipment does not need to be decontaminated between runs. Each run with the sampling probe and bottles should be recorded and performed as described above in Sections 1.6 and 1.9.

1.19 Each sample will be appropriately labeled, logged on the chain-of-custody, and packaged in a cooler with ice for delivery to the laboratory.

2.0 Westbay Sampling Probe and Bottles Decontamination Procedures

2.1 The Westbay sampling probe and bottles must be decontaminated prior to moving between each monitoring zone (but not for multiple use within a single zone). Before disconnecting the sampling probe and bottles from the MAGI, activate the shoe so it is extended out from the sampling probe and open the sampling port valve. The decontamination process includes the following:

- The equipment decontamination wash solution will consist of Liquinox (or equivalent) and store-bought distilled water. The equipment rinse solution will consist of store-bought distilled water. The wash and rinse process can be performed in clean 5-gallon plastic buckets.
- Ensure that all the valves between sample bottles are open. Separate the sample bottles from their end caps (valves and connection lines between sample bottles).
- Wash the Westbay sample bottles in the wash solution by using a brush to scrub the inside and outside of the sample bottle. The bottle should then be rinsed by pouring distilled water over the outside and through the inside of the sample bottle.
- Disconnect the sample bottle end caps (valves) from the connection lines. Swirl the end caps in the wash solution and use a dedicated wash squirt bottle to direct a spray of wash solution through the valve. Rinse with distilled water, including using a dedicated rinse squirt bottle to rinse the valve.
- Use a dedicated wash squirt bottle to direct a spray of wash solution through the connector line. Use a dedicated rinse squirt bottle to rinse the connector lines with distilled water. Inspect o-rings for damage or wear, and replace if necessary.
- The sampling probe should NOT be completely submerged in the wash solution. A scrub brush saturated in the wash solution may be used to scrub the exterior of the probe. The sample tool must be disconnected from the MAGI prior to cleaning. To clean the sample tool, use the dedicated wash squirt bottle to direct a spray of wash

solution through the sampling port of the extended shoe. The wash solution will run through the inside of the tool, and exit through the bottom of the sampling probe. Use the dedicated rinse squirt bottle to rinse the sampling probe with distilled water by directing a spray of distilled water through the sampling port of the extended shoe. Finally, rinse the exterior of the sampling probe with distilled water. Visually inspect the sampling port o-ring (seal) for damage or wear and replace as necessary to ensure a seal between the sample tool and sample port.

2.2 Following decontamination, the Westbay sampling probe and bottles should be either returned to the storage container, or assembled for additional sampling on a split PVC casing or other clean, level surface.

2.3 Reference the Westbay Operations Manual for complete instructions on care, storage, and use of the sampling probe and bottles. Among the details noted in the manual, it is extremely important that the sampling probe is NOT exposed to below freezing temperatures or the pressure transducer could be damaged.

APPENDIX C

ENVIRONMENTAL STANDARDS
Setting the Standards for Innovative Environmental Solutions

QUALITY ASSURANCE PROJECT PLAN
FOR THE COMPREHENSIVE GROUNDWATER MONITORING PLAN AT
CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FLORIDA

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Appendix A Data Package Deliverables

Appendix B Electronic Data Deliverables

1.0 INTRODUCTION

1.1 Problem Statement

The Site is a former wood treatment facility whose historical operations have affected soil and groundwater. The Site has been undergoing remedial investigation, remedial planning, and remedial action under the oversight of the US EPA since the late-1980s.

The primary objective of the groundwater monitoring within the context of the site-wide program is to generate consistent data of known quality that can be used to enhance the understanding of site-wide groundwater conditions. The groundwater monitoring frequency is defined in the Comprehensive Groundwater Monitoring and Sample Analysis Plan (CGMSAP). The target analytes and reporting limits for these groundwater monitoring events are also presented in the CGMSAP in Section 5.9 and on Tables 5-3, 5-4, and 5-6.

1.2 Project Description and Applicability

On behalf of Beazer East, Inc. (Beazer), Environmental Standards, Inc. (Environmental Standards) has prepared this Quality Assurance Project Plan (QAPP). The QAPP presents the project organization, objectives, procedures, functional activities, and specific quality assurance (QA) and quality control (QC) activities associated with the evaluation of the potential presence, if any, of site-related constituents in groundwater at the Cabot Carbon/Koppers Inc. Superfund Site (Site) in Gainesville, Florida. The Koppers facility and the Cabot Carbon Site, located immediately to the east of the Koppers property, have been undergoing remedial investigation, remedial planning, and remedial action under the oversight of the US EPA for about 20 years.

This QAPP includes the activities associated with the organization; laboratory, data management, and field activities; and data reporting and archiving for all field samples included in this Project. The requirements of this QAPP are applicable to affiliated project personnel, support groups, contractors, and subcontractors. This QAPP is intended to establish an overall QA plan to provide the Project framework; additional requirements are presented in the CGMSAP. Data Quality Objectives (DQOs) and general requirements associated with various analysis, data generation, data reduction, and reporting activities are stipulated herein.

1.3 Purpose and Scope

The purpose of this QAPP is to detail the requirements for the performance of activities associated with the sampling and laboratory analysis necessary to defensibly establish the absence or presence of arsenic, chromium, semivolatile organic compounds, and volatile organic compounds in groundwater samples collected at the Site.

The scope of this document is to provide the appropriate QA procedures and QC measures to be applied throughout the Project and to address the following items:

- QA objectives
- Laboratory procedures
- Sample collection, handling, and preservation
- Sample analysis, data reduction, validation, and reporting
- Internal QC checks
- QA performance and system audits
- Preventive maintenance procedures and schedules
- Data assessment procedures, including processing, interpretation, and presentation
- Corrective actions
- QA reports to management

1.4 Data Quality Objectives

The goals of data collection during the on-going groundwater monitoring sampling and subsequent analysis of project samples are to identify the presence of site-related constituents with defensible accurate analyses. Specifically, meeting appropriate DQOs, which will allow Beazer to utilize the analytical data to the fullest extent possible, is required.

The Data Objectives for the project are established to ensure that the data generated are of known and acceptable quality. Primary Data Objectives of this project are to:

- Monitor the presence or absence of targeted analytes with a known degree of accuracy and precision.
- Generate consistent and defensible analytical data to provide an enhanced understanding of the groundwater conditions at the Site.
- Generate analytical data that meet or exceed the quality assurance and quality control indices detailed in Section 3.0 and on Tables 1 through 6.

Chemical analysis will be conducted on samples to determine if arsenic, a defined list of volatile organic compounds, and a defined list of semivolatile organic compounds are present in groundwater samples at the Site. The rationale for the selection of the specific analytes is presented in the CGMSAP.

To ensure that the data generated are of known and acceptable quality to meet or exceed the intended data collection purpose, this QAPP defines provisions for the following:

- Development of standards for performance related to the sampling and analytical scope-of-work.
- Monitoring performance to determine compliance with the established methods.
- Reporting the activities associated with performance monitoring.
- Documented correction when performance does not conform to the established standards.

To achieve the Data Objectives, QA measures will be implemented throughout the Project to ensure that the data generated meet or exceed the data quality indices relative to the accuracy, precision, representativeness, comparability, and completeness data quality indicators. In general, data quality will be monitoring and controlled through the documented calibration of field and laboratory equipment following US EPA protocols and the collection and analysis of field QC samples. Implementation of QA/QC measures will allow project personnel to assess data quality relative to the Data Objectives.

The data quality from fixed-based laboratory analyses (using US EPA methods) will be critically assessed by performing limited data validation for 90% of the data and full data validation for 10% of the data. These data validation activities are discussed in detail in Subsection 8.2.4.

1.5 Schedule

The anticipated schedule of activities is detailed below.

- Field sampling and analytical activities will be performed according to the schedules provided in Tables 2-1, 2-2, and 2-3 of the CGMSAP.
- Samples will be delivered to the laboratory on a daily basis via courier or over-night delivery.
- The laboratory will provide analytical results, complete data packages, and electronic data deliverable (EDD) within 15 business days of sample receipt.
- The EDD will be screened for acceptability relative to the project database within 7 business days of receipt.
- An initial completeness review (see Section 8.2.4) will be performed within 7 business days of each data package receipt.
- A report will be prepared for Agency review within 90 business days of the receipt of the laboratory data deliverables.

1.6 Special Training/Certification

All field personnel will have completed a training course of at least 40 hours that meets the requirements specified in 29 CFR Part 1910.120(e) for safety and health at hazardous waste operations and a refresher course of at least 8 hours that meets the requirements of 29 CFR Part 1910.120(e) for safety and health at hazardous waste operations within the last 12 months.

All individuals who plan to participate in field activities will notify the Field Technical Services Field Team Leader of their intent to participate and provide evidence of current health and safety training prior to commencement of sample collection activities. The Field Team Leader will ensure that all participants who arrive at the site have provided evidence of health and safety training. No other specialized training is anticipated for this project. Field personnel performing sample collection activities will be properly trained in equipment use and procedures necessary for each task prior to entering the field. The Field Technical Services Contractor will employ its internal processes/procedures for establishing that personnel are adequately experienced in the duties they are expected to carry out and receive any needed training. Training courses or workshops on specific equipment, techniques, or procedures shall all be

documented. It will be the responsibility of the Field Team Leader to ensure that field personnel understand and comply with the applicable QAPP requirements for their individual tasks.

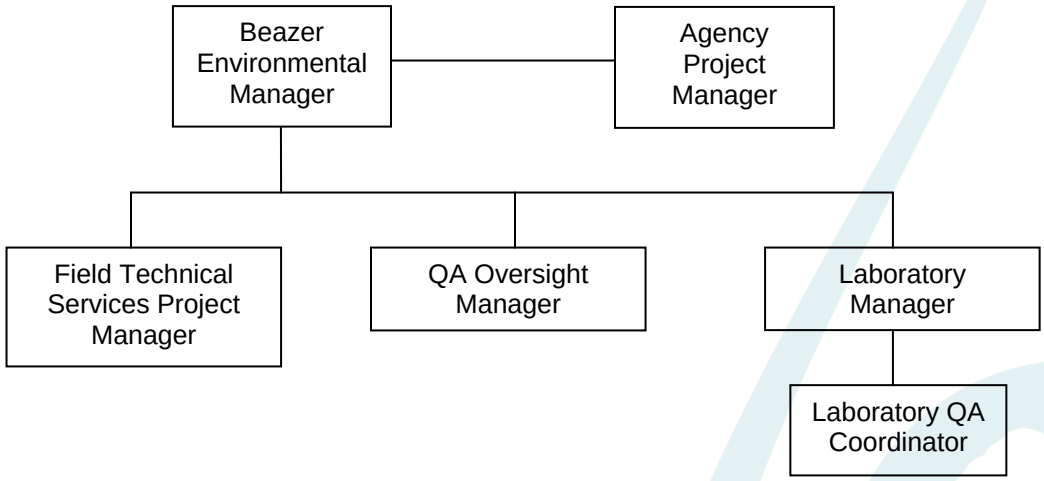
Personnel who are responsible for performing laboratory analyses will be properly trained by the Laboratory Director or her/his designee to conduct the various laboratory analyses described in this QAPP. The laboratories participating in this Project will have training programs that are equivalent to those requirements in the National Environmental Laboratory Accreditation Conference (NELAC/NELAP) Standards, Section 5.0 Quality Systems. The laboratory shall have sufficient personnel with the necessary education, training, technical knowledge, and experience for their assigned functions.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

2.1 Project Organization

This section describes the organizational structure and lines of authority. Project activities will be performed within the framework of the organization and functions described in this section. Emphasis is placed on the organization and entities responsible for the implementation and administration of this QAPP. The organizational structure showing relationships of individuals with key responsibilities is presented in Figure 2-1.

FIGURE 2-1: ORGANIZATIONAL STRUCTURE



The organizational structure is designed to provide clear lines of responsibility and authority. This control structure encompasses the following activities:

- Identifying lines of communication and coordination.
- Monitoring project schedules and performance.
- Managing key technical resources.
- Providing periodic progress reports.
- Coordinating support functions such as laboratory analysis and data management.
- Rectifying deficiencies and issues.

Field and laboratory personnel providing services in support of Project efforts will perform work in strict compliance with the appropriate contract specifications for the activity.

QA personnel will have sufficient authority, organizational freedom, and ability to perform the following tasks:

- Identify QA problems.

- Initiate, recommend, or provide solutions to QA problems through designated channels.
- Ensure that project activities, including processing of information, delivery of deliverables, and installation or use of equipment, are reviewed in accordance with QA objectives.
- Ensure that deficiencies/nonconformances are corrected.
- Ensure that further processing, delivery, or use of data is controlled until the proper disposition of a nonconformance, deficiency, or unsatisfactory condition.

2.2 Agency Project Manager (PM)

US EPA Region IV is the primary agency for this Site. The Florida Department of Environmental Protection (FDEP) and the Alachua County Environmental Protection Division (ACEPD) are included on project correspondence and documents. The US EPA Region IV PM has regulatory oversight responsibilities for this Project, including:

- Schedule meetings, if necessary, between the Agency and representatives of Beazer.
- Review and approve proposed schedules.
- Review and approve documents and reports.

2.3 Beazer Environmental Manager

The Beazer Environmental Manager holds overall management responsibility for the Project, including the following:

- Approve documents prior to submission to US EPA Region IV and other organizations.
- Represent Beazer at meetings.
- Review and analyze overall task performance with respect to Project requirements.
- Define project objectives for the Project as a whole.

2.4 Field Technical Services Project Manager

The Field Technical Services Project Manager will assist the Beazer Environmental Manager with the overall Project, including objectives, scope, schedule, and regulatory submittals. Other responsibilities include promoting continuity, reporting to the Beazer Environmental Manager and QA Oversight Manager, and providing support and guidance for all activities at the Site. The Field Technical Services Project Manager will have overall responsibilities for field and Agency reporting activities.

2.5 QA Oversight Manager

The QA Oversight Manager will oversee all quality assurance aspects of the Project. Specific tasks include:

- Reporting directly to the Beazer Environmental Manager.

- Advising the Beazer Environmental Manager on issues relating to data quality.
- Review of project documents.
- QA oversight of field sampling and analytical and data validation activities.
- Supporting the analytical laboratories relative to sample preparation and analysis issues.
  Supporting the Project Team relative to sample collection and data issues.

2.6 Laboratory Project Manager

The Laboratory Project Manager will schedule project analytical activities, monitor analytical status/deadlines, approve laboratory reports, coordinate data revisions/corrections and resubmission of packages, and communicate sample preparation and analyses issues to the QA Oversight Manager and Field Technical Services Project Manager on a real-time basis. The Laboratory Project Manager will provide direction/support for administrative and technical project staff, interface with laboratory project staff on technical issues, and provide QA oversight of analytical data. The Laboratory Project Manager will contact the Field Technical Services Project Manager, if at any point, there is a need to deviate from the QAPP.

2.7 Laboratory QA Coordinator

The Laboratory QA Coordinator will ensure conformance with authorized policies, procedures, and sound laboratory practices as necessary. The Laboratory QA Coordinator will inform the Laboratory Project Manager of any nonconformances, introduce control samples into the sample train, and establish testing lots. In addition, the Laboratory QA Coordinator will approve laboratory data before reporting or transmittal to permanent storage and will be responsible for retention of supporting information such as control charts and other performance indicators to demonstrate that the systems that produced the data were in control. The Laboratory QA Coordinator will also review results of internal QA audits and recommend corrective actions and schedules for their implementation.

The responsibilities of the Laboratory QA Coordinator will include the following:

- Administering the laboratory QA/QC program.
- Implementing QC procedures for each test parameter.
- Reviewing analytical results, including raw data, calculations, and laboratory logbooks.
- Monitoring proper documentation and maintenance of the records.
- Identifying and implementing training requirements for the laboratory analytical personnel.
- Overseeing QA/QC implementation at the laboratory on a daily basis.
- Identifying QA/QC problems and recommending appropriate corrective action.
- Preparing status reports (progress, problems, and recommended solutions).
- Preparing reports documenting completion of corrective actions.

3.0 QUALITY ASSURANCE AND QUALITY CONTROL OBJECTIVES

3.1 General

DQOs are assessed by monitoring QA measures, such as accuracy, precision, representativeness, comparability, and completeness, as discussed in Subsection 1.4. Specific qualitative DQOs are presented in detail in Section 11.0 and on Tables 1, 2, 3, 4, 5, and 6 of this QAPP. The objectives associated with accuracy and precision of laboratory results are assessed through an evaluation of the results of QC samples. The accuracy of field measurements for temperature and other field parameters will be assessed by equipment calibration, as described in the CGMSAP.

3.2 Quality Control Samples

QA will be verified by maintaining site logs, by documenting field activities, and by collecting and analyzing QC samples. QC samples will be used to assess laboratory performance and gauge the likelihood of cross-contamination associated with both field and laboratory activities. QC samples will be collected and analyzed in conjunction with samples designated for laboratory analysis using US EPA methods.

3.2.1 Field Quality Control Samples

Standard analytical QC checks that will be instituted by field personnel may include the following:

- Trip Blank Samples
- Field Blank Samples
- Equipment Rinsate Blanks
- Filter Blank Samples
- Field Duplicate Samples
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

Additional information concerning field quality control sampling and analysis requirements are summarized in the CGMSAP in Section 4.0 and on Table 4-1.

3.2.2 Laboratory Quality Control Samples

Standard analytical QC checks that may be instituted by laboratory personnel will include , but not be limited to, the following:

- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples
- Surrogate Spiking
- Internal Standard Spiking

- Method Blanks
- Laboratory Control Samples
- Laboratory Duplicate Samples
- Temperature Blanks

These types of laboratory QC samples are discussed in the following subsections.

3.2.2.1 Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate (MS/MSD) samples are investigative samples to which known amounts of compounds are added in the laboratory before extraction/digestion and analysis. The recoveries for spiked analytes can be used to assess how well the method used for analysis recovers target analytes in the site-specific sample matrix. For this Project, at least one set of MS/MSD samples will be collected and analyzed for each 20 Beazer samples collected or one per shipment. The laboratory will prepare and analyze one set of MS/MSD samples for every batch of 20 (or less) samples. The laboratory will utilize a project sample for the MS/MSD pair for every batch that includes a project sample.

3.2.2.2 Surrogate Spiking

Surrogate spiking will be performed for organic analysis of samples and will consist of adding reference compounds to samples before sample preparation. Surrogate compound recovery will be used to assess method accuracy on a sample-specific basis. Surrogate compounds will be added to investigative and QA/QC samples as appropriate to the analytical method as indicated on Table 2 and Table 3.

3.2.2.3 Internal Standard Spiking

Internal standard spiking consists of adding reference compounds to samples after preparation but prior to analysis for both organic and inorganic methods. Internal standard analytes will be used to perform quantitation of all target analytes for SW-846 Methods 6020, 8260B, and 8270C. Internal standard compounds will be added to all investigative and QA/QC samples as indicated on Tables 1, 2 and 3.

3.2.2.4 Laboratory Method Blanks

Method blanks consist of materials and reagents (*e.g*., analyte-free water) that are prepared in the same manner as the associated samples (*e.g.,* digested, extracted) and that are analyzed and reported in the same manner as the associated investigative samples. Method blanks are used to evaluate potential contamination due to sample preparation and analysis. Laboratory method blanks will be performed as indicated in the analytical method and as indicated on Tables 1, 2, and 3.

3.2.2.5 Laboratory Control Samples

A laboratory control sample (LCS) is a sample of laboratory certified material that is fortified (spiked) with the analytes of interest or a certified reference material that is prepared and

analyzed in the same manner as investigative samples. LCS data are used to monitor analytical accuracy and laboratory performance. LCSs will be performed as indicated in the analytical method and as indicated on Tables 1, 2, and 3.

3.2.2.6 Temperature Blanks

The purpose of preparing temperature blanks and their shipment in sample coolers from the field is to enable the laboratory to determine cooler (and sample) temperature upon their receipt at the laboratory. A temperature blank will be provided in each cooler sent from the laboratory to the field.

4.0 FIELD INVESTIGATION PROCEDURES

Detailed descriptions of the procedures for the sampling, identification, packaging, and handling of project samples; the decontamination of sampling equipment; and the maintenance of sampling equipment are presented in the CGMSAP.

Field investigation and sampling procedures will be conducted such that samples are representative of the medium sampled and the resultant data can be compared to other data sets.

5.0 SAMPLE IDENTIFICATION, DOCUMENTATION, AND CUSTODY

Field sampling personnel are responsible for the collection, description, documentation, labeling, packaging, storage, handling, and shipping of samples obtained in the field. Proper field practices are necessary to ensure sample integrity from collection through laboratory analysis and data reporting. To meet the Data Objectives of this QAPP, information relative to the Project samples will be properly described and documented and samples will be labeled, preserved, packaged and shipped to the laboratory for analysis in appropriate sample containers, under the recommended temperature conditions, and with a Chain-of-Custody Record. The sample identification system for this Project is presented in the CGMSAP.

Laboratory-supplied sample kits with custody seals, field Chain-of-Custody Records, packing materials, and US EPA-recommended sample containers and preservation methods presented on Table 3-1 in the CGMSAP will be used for all Project samples during sample collection and transport to the laboratory.

5.1 Sample Chain-of-Custody

Laboratory evidentiary files will be maintained by the Field Technical Services Project Manager and the Laboratory QA Coordinator and will include information that defines the Project in its entirety. The chain-of-custody will be initiated in the field and will continue through receipt at the laboratory.

5.1.2 Sample Custody in the Field

Procedures for sample custody in the field are provided in Section 5.6 of the CGMSAP.

5.1.3 Sample Custody in the Laboratory

The following subsections describe the Chain-of-Custody procedures associated with sample receipt, storage, tracking, and documentation by the laboratory.

5.1.3.1 Sample Receipt

A designated Laboratory Sample Custodian will be responsible for samples received at the laboratory. The Laboratory Sample Custodian will be familiar with custody requirements and the potential hazards associated with environmental samples. In addition to receiving samples, the Laboratory Sample Custodian will also be responsible for documenting sample receipt, storage before and after sample analysis, and the proper disposal of samples. Upon sample receipt, the Sample Custodian will:

- Inspect the sample containers for integrity and ensure that custody seals are intact on the shipping coolers. The temperature of the samples upon receipt and the presence of leaking or broken containers will be noted on the Chain-of-Custody Record/sample receipt forms.
- Sign (with date and time of receipt) the Chain-of-Custody/sample analysis request forms, thereby assuming custody of the samples and assign the laboratory sample identification numbers.
- Compare the information of the Chain-of Custody Record/sample receipt with the sample labels to verify sample identity. Any inconsistencies will be resolved with the Field Technical Services Project Manager before sample analysis proceeds.
- Store samples in accordance with Subsection 5.1.3.2.

5.1.3.2 Sample Storage

Analytical samples will be stored in a locked refrigerator and maintained at $\leq 6°C$ but not frozen, with the exception of the aqueous sample aliquots for metals that may be maintained at ambient temperature with acid preservation. The temperature will be monitored and recorded daily by laboratory personnel.

5.1.3.3 Sample Tracking

Each sample will receive a unique laboratory sample identification number at the laboratory when the sample is logged into the laboratory information management system.

A sample extraction or digestion record will be prepared. Laboratory data will be entered on the sample extraction form and permanently recorded in a laboratory logbook.

The laboratory will maintain a sample tracking system that documents the following:

- Organization/individual who performed sample analyses.
- Date of sample receipt, extraction or digestion, and analysis.
- Names of analysts.

- Sample preparation procedures.
- Analytical methods used to analyze the samples.
- Calibration and maintenance of instruments.
- Deviations from established analytical procedures, if applicable.
- QC procedures used to ensure that analyses were in control during data generation (instrument calibration, precision checks, method standards, method blanks, *etc.*).
- Procedures used for the calculation of precision and accuracy for the reported data.
- Statement of quality of analytical results.

5.2 Record-Keeping

This CGMSAP will be distributed to each contractor responsible for the collection, generation, and interpretation of field and analytical data. The Field Services Technical Manager will be responsible for ensuring that necessary revisions are made such that the CGMSAP is up-to-date with actual practices and will distribute the updates. The document control format used in this CGMSAP will identify the CGMSAP revision number and revision date.

Analytical data for this Project will be reported in both an electronic data deliverable (EDD) and an Adobe® Acrobat® .pdf electronic analytical data package. The EDD format is presented as Appendix B. The EDD will be generated by the laboratory and will be used to facilitate loading the analytical data into the Project database.

Analytical data packages will be prepared by the laboratory for all sample analyses performed. Initial analytical results will be provided by the laboratory within 15 business days of sample receipt. Complete data packages will be provided by the laboratory in an Adobe® Acrobat® .pdf electronic format for all analyses within 15 business days of sample receipt. The Adobe Acrobat .pdf electronic data package will be submitted to the Field Technical Services Project Manager. A summary of results will be provided to other necessary personnel for use in checking the Project analytical database against hardcopy results or other preliminary evaluation.

Appropriate records will be maintained to provide adequate documentation of the entire data generation process, including field sampling and laboratory analysis. Field sampling records will include maintaining field logs and sample Chain-of-Custody documentation. Field QA/QC samples will be documented on both the field log and sample Chain-of-Custody Records.

The final evidence file will be the central repository for documents relevant to sampling and analysis activities as described in this QAPP. Beazer, the Field Technical Services Project Manager, and the Quality Assurance (QA) Project Manager will maintain the files for this Project, including all relevant records, correspondence, reports, logs, data, field records, pictures, subcontractor reports, analytical data, and data reviews. The file will include the following information if generated:

- Field records
- Field data and data deliverables
- Photographs
- Drawings
- Sample logs
- Laboratory data deliverables
- Data validation reports
- Field and laboratory audit reports, if applicable
- QA reports
- Custody documentation

5.3 Sample Packaging and Shipment

Samples will typically be packed and delivered to the laboratory *via* laboratory courier or field personnel. If samples are shipped for overnight delivery to the contracted laboratory, all applicable US Department of Transportation (US DOT) regulations, consulting corporate guidelines, and International Air Transport Association (IATA) standards (as detailed in the most current edition of *IATA Dangerous Goods Regulations* for hazardous materials shipments) will be adhered to.

6.0 CALIBRATION PROCEDURES

This section provides the requirements for calibration of measuring and test equipment/instruments used in field sampling and laboratory analysis. The calibration procedures stipulated in this QAPP are designed to ensure that field equipment and instrumentation are calibrated to operate within manufacturer specifications and that the required traceability, sensitivity, and precision of the equipment/instruments are maintained. Measurements that affect the quality of an item or activity will be taken only with instruments, tools, gauges, or other measuring devices that are accurate, controlled, calibrated, adjusted, and maintained at predetermined intervals to ensure the specified level of precision and accuracy.

6.1 Field Equipment Calibration and Procedures

The Field Technical Services Field Team will be utilizing equipment that will require calibration for this Project. All meters will be calibrated as described in Section 5.2.2 of the CGMSAP.

6.2 Laboratory Equipment Calibration

Instruments and equipment used in the laboratory will be controlled by a formal calibration program. The program will verify that the equipment has the proper calibration range, accuracy, and precision to generate data comparable with specific requirements. All calibration will be performed by laboratory personnel experienced in the referenced methods for the analysis of Project samples for the constituents of concern in accordance with Tables 1, 2, and 3.

The laboratory will provide all data and information to demonstrate that the analytical system was properly calibrated at the time of analysis, including calibration method, required frequency, source of standards, response factors, linear range, check standards, and applicable control limits, as part of the data deliverables.

Before any instrument is used as a measuring device, the instrument's response to reference materials must be determined. The manner in which various instruments are calibrated is dependent on the particular type of instrument and its intended use. Preparation of reference materials used for calibration will be documented in a laboratory notebook.

The two types of laboratory instrument calibration are initial calibration and continuing calibration verification. Initial calibration procedures establish the calibration range of the instrument. Typically, multiple analyte concentrations are used to establish the calibration range and calibration data. The laboratory evaluates the resulting calibration data as detailed on Tables 1, 2, and 3.

Continuing calibration verification usually measures the instrument's response to fewer calibration standards and requires instrument response to fall within certain limits (*e.g.,* 20%) of the initial measured instrument response. Continuing calibration verification may be used within

an analytical sequence to verify stable calibration throughout the sequence and/or to demonstrate that instrument response did not drift during a period of non-use of the instrument.

The QA/QC measures on Tables 1, 2, and 3 will be used for calibration, calibration verification, and subsequent sample analyses. In addition, the following procedures will be used for the calibration of balances and thermometers.

6.2.1 Balances

Laboratory balances will be calibrated and serviced annually by a certified external contractor. In addition, the analyst will check the balance daily before use. A record of calibrations and daily checks will be maintained in the balance log.

6.2.2 Thermometers

Oven and refrigerator thermometers will be calibrated annually against a NIST-certified thermometer in the range of interest. Annual calibrations will be recorded in a calibration notebook. Daily oven and refrigerator readings will be monitored and recorded.

6.2.3 Records

Records will be maintained as evidence of required calibration frequencies, and equipment will be marked suitably to indicate calibration status. If marking on the equipment is not possible, records traceable to the equipment will be readily available for reference.

7.0 ANALYTICAL PROCEDURES

Routine analytical services are performed using standard US EPA-approved methodology. Analytical methods and reporting limits are cited in Section 5.9 of the CGMSAP.

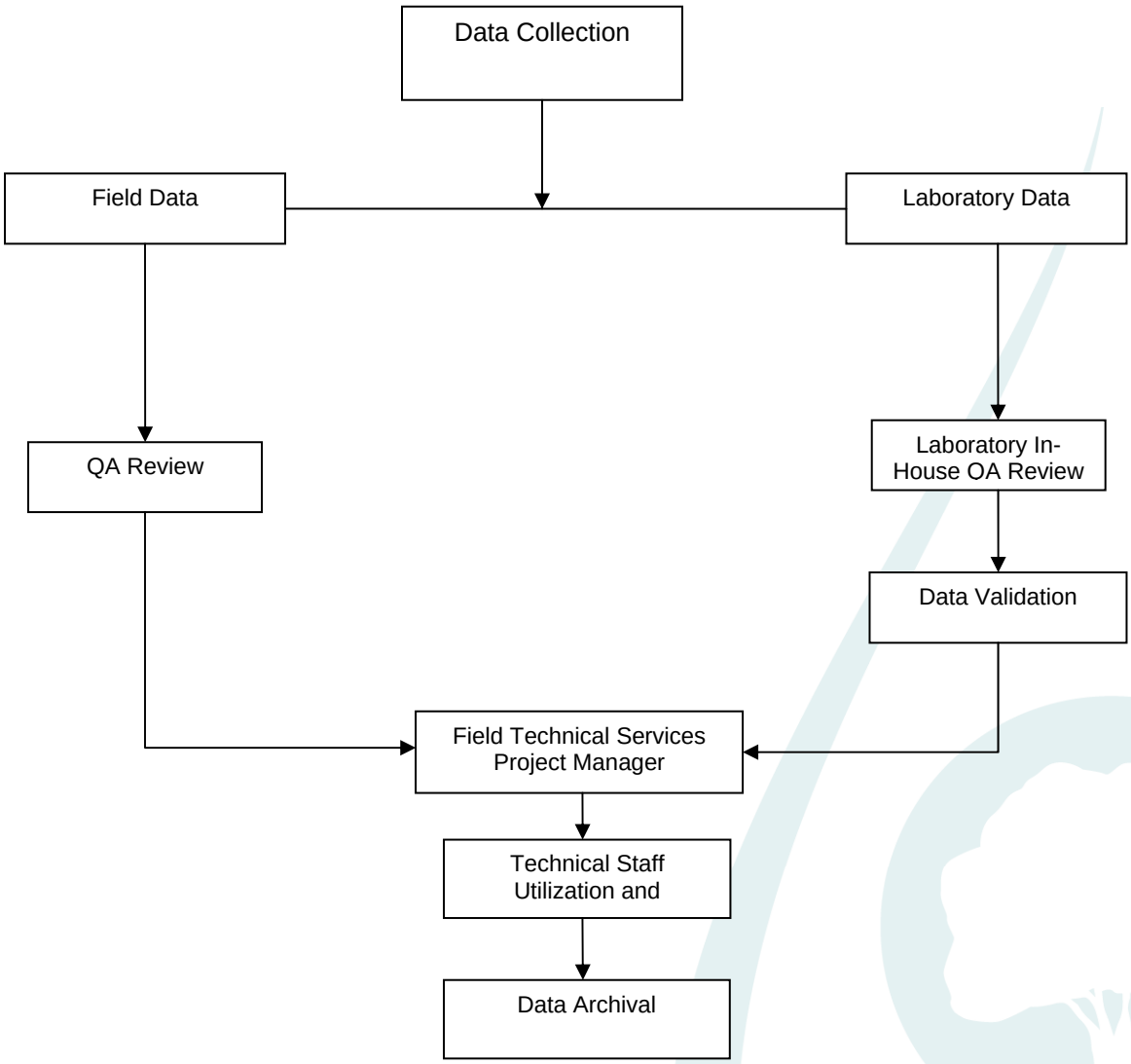
8.0 DATA REDUCTION, VALIDATION, AND REPORTING

A flow diagram depicting the general relationship of data collection, reduction, validation, management, and reporting is shown in Figure 8-1.

8.1 Field and Technical Data

Section 5.7 of the CGMSAP presents the data reduction, validation, and reporting requirements for the field and technical data.

FIGURE 8-1: DATA MANAGEMENT FLOW CHART



8.2 Laboratory Data Documentation

The laboratory for the Project will retain records of the analytical data for a minimum of 5 years after Project completion.

8.2.1 Data Reduction

Data reduction is performed by the individual analysts and consists of calculating concentrations in samples from the raw data obtained from the measuring instruments. The complexity of the data reduction is dependent upon the specific method and the number of discrete operations (*i.e.*, extractions/ digestion, dilutions, and levels/concentrations) involved in obtaining a sample that can be measured.

For all analytical methods, sample response will be applied to the average response factor or the regression line to obtain an initial raw result, which will then be factored into equations to obtain the estimate of the concentration in the original sample. Rounding will not be performed until after the final result has been obtained to minimize rounding errors; results will not normally be expressed in more than three significant figures.

Copies of raw data and calculations used to generate the final results will be retained on file to allow reconstruction of the data reduction process at a later date.

8.2.2 Laboratory Data Review

System reviews are performed at all levels. The individual analyst constantly reviews the quality of data through calibration checks, QC sample results, and performance evaluation samples. These reviews will be performed prior to submission to the Laboratory Project Manager.

Criteria for analytical data review/verification include checks for internal consistency, transmittal errors, laboratory protocol, and laboratory QC. QC sample results and information documented in field notes will be used to interpret and evaluate laboratory data. The laboratory QA Department will independently conduct a complete review of selected reports to confirm analytical results.

The laboratory will complete data verification procedures, including:

- Verifying analyses requested.
- Preliminary data proofing for anomalies - investigation and corrections, where possible.
- Reviewing laboratory data sheets for reporting/method detection limits, holding times, surrogate recovery performance, internal standard performance, and spike recovery performance.
- Double-checking computerized data entry, if applicable.

The Laboratory Project Manager will review data for consistency and reasonableness with other generated data and determine whether Project requirements have been satisfied. Selected hardcopy output of data (chromatograms, spectra, integrations, *etc.*) will be reviewed to ensure that results are interpreted correctly. Unusual or unexpected results will be reviewed, and a determination will be made as to whether the analyses should be repeated. In addition, the Laboratory Project Manager may recalculate selected results to verify the calculation procedure.

The Laboratory QA Coordinator will independently conduct a complete review of the Project data to determine whether laboratory analytical requirements and the requirements for this QAPP have been met. Discrepancies will be reported to the Laboratory Project Manager for resolution.

Prior to final review/sign-off by the Laboratory Project Manager, laboratory personnel will verify that the report deliverable is complete and in proper format, screen the report for compliance to laboratory and QAPP requirements, and ensure that the Case Narrative addresses any noted

deficiencies. The Laboratory Project Manager will perform the final laboratory review prior to reporting the results to Field Technical Services Project Manager.

8.2.3 Data Reporting/Deliverable Package

The laboratory will be responsible for providing an approved electronic data deliverable (EDD; see Appendix B) as well as an Adobe® Acrobat® .pdf of the hardcopy report (see Appendix A). The deliverable package will contain final results (uncorrected for blanks and recoveries), analytical methods, reporting/method detection limits, surrogate recovery data, method blank data, and results of QC samples. In addition, special analytical problems and/or any modifications of referenced methods will be noted. The number of significant figures reported will be consistent with the limits of uncertainty inherent in the analytical method. Data are normally reported in units commonly used for the analyses performed. Concentrations in liquids are expressed in terms of weight per unit volume (*e.g.,* micrograms per liter [µg/L]).

In addition, 100% of the data will be reported in full "Contract Laboratory Program (CLP)-like" (as applicable to the SW-846 QC criteria) documentation data packages for independent data validation in accordance with guidance from US EPA *Guidance in Environmental Data Validation* (EPA QA/G-8, 2004). The format for the data package is provided in Appendix A.

QC results reported will include a method blank, matrix spike/matrix spike duplicate (MS/MSD) samples, field QC samples, and laboratory control samples (LCSs). Sample data results (including QC sample results) will also be provided in the electronic format. The laboratory is responsible for reviewing the electronic data to ensure that these data are consistent with hardcopy CLP-like results. Data discrepancies between the EDD submission and hardcopy (pdf) results, if any, will be reconciled at validation; the contract laboratory and the Field Technical Services Project Manager will be informed by the QA Oversight Manager so that changes are made and the final hardcopy reports are made consistent with the EDD and archived by the Field Technical Services Project Manager.

8.2.4 Data Review and Validation

The purpose of analytical data validation is to eliminate unacceptable data and to qualify data for any data quality limitations identified during validation. In addition to the laboratory QA review, the CLP-like reports will be evaluated and validated by the QA Oversight Manager for the following:

- Compliance with requested testing
- Completeness
- Reporting accuracy (including hardcopy to EDD)
- Confirmation of receipt of requested items

For this Project, 90% of the data will undergo a limited data validation. The limited data validation effort will include evaluation of holding times, potential contamination, MS/MSD results, LCS results, surrogate recoveries, internal standard performance, initial calibration performance, initial calibration verification performance, continuing calibration standard performance, ICP/MS low-level initial calibration standard recoveries, ICP/MS interference

check sample standard results, and ICP/MS serial dilution results. Raw data will not be evaluated for the limited data validation effort.

In addition, 10% of the data will be validated with guidance from the National Functional Guidelines for Organic Data Review (US EPA, June 2008) and National Functional Guidelines for Inorganic Data Review (US EPA, October 2004). Analytical data from fixed laboratories will be rejected and otherwise qualified with guidance on the National Functional Guidelines referenced above. The data validation qualifiers listed below will be used for all Project samples.

- Organic Data Validation Qualifiers

U	This compound should be considered "not detected" because it was detected in a laboratory method blank at a similar level.
J	Quantitation is approximate due to limitations identified during data validation.
R	Unusable result; analyte may or may not be present in sample.
UJ	This analyte was not detected, but the reporting limit may or may not be higher due to a bias identified during data validation.

- Inorganic Data Validation Qualifiers

U	This result should be considered "not detected" because it was detected in a laboratory blank at a similar level.
R	Unusable result; analyte may or may not be present in sample
J	Quantitation is approximate due to limitations identified during data validation.
UJ	This analyte was not detected, but the reporting limit may or may not be higher due to a bias identified during data validation.

8.3 Data Management

A copy of the Chain-of-Custody Record will be delivered to the Field Technical Services Project Manager for inclusion in the Project files. Upon receipt and log-in of the samples at the laboratory, the remaining sections of the Chain-of-Custody Record (*e.g.*, description of the sample condition at the time of receipt, assigned laboratory identification number, and any special conditions) will be completed. Discrepancies will be documented by the laboratory, and the Field Technical Services Project Manager will be notified.

The field Chain-of-Custody Record information will be initially keyed into and maintained in the laboratory's database. A copy of the laboratory's Chain-of-Custody Record, referred to as sample receipt confirmation, will be sent to the Field Technical Services Project Manager following sample log-in for verification of properly entered and handwritten Chain-of-Custody Record requests and information such as sample identification numbers, analyses requested, and the quantity of samples. In case of discrepancies between the Chain-of-Custody Record and the sample receipt confirmation, the appropriate revisions will be communicated to the laboratory for applicable Chain-of-Custody Record corrections. Corrected information on the Chain-of-Custody Record will be recorded into the project data management system.

The samples received by the laboratory will be analyzed following internal QC procedures. The laboratory's hardcopies, on submission to the Field Technical Services Project Manager, will be validated under the direction of the QA Oversight Manager with guidance from the National Functional Guidelines discussed in Subsection 8.2.4; corrected if required information is missing or is inadequately completed; and appropriate qualifiers will be added. Any data rejected during data validation due to imprecision, holding time exceedance, and failure of relevant QC measures will be qualified or not utilized for the Project.

The Field Technical Services Project Manager will check EDDs for an overall database format compatibility and acceptability and will be responsible for the database and its maintenance. The Field Technical Services Project Manager will also be responsible for the export of validated data and the validation of EDDs. Tables with target analytes and levels of detection for Project samples and relevant QC will be compiled by the Field Service Project Manager to facilitate comparison with risk-based target concentrations.

8.4 Data Archival

Applicable electronic field and laboratory data collected from the Site during sampling will be archived electronically. Backup tapes containing databases and programs or software utilities will be maintained in a secure location.

9.0 INTERNAL QUALITY ASSURANCE/QUALITY CONTROL

9.1 Field Analysis

Field analysis QC checks will consist of calibrations as detailed in the CGMSAP Section 5.2.2.

9.2 Laboratory Analysis

Internal laboratory QC checks will consist of the following:

- Instrument performance checks.
- Instrument calibration.
- Retrieval of documentation pertaining to instrument standards, samples, and data.
- Documentation of sample preservation, transport, and analytical methodology.
- Analysis of QC samples (discussed in Subsection 5.0).
- Meeting the specific method requirements on Tables 1, 2, and 3.

9.3 Reporting Checks

After validated laboratory data have been made available, the data will be compiled into tables to facilitate the assessment of results. An independent check of the data entered into these tables will be performed for accuracy and completeness, and corrections will be made as addressed and discussed in Subsections 8.0 and 11.0.

10.0 PREVENTIVE MAINTENANCE

10.1 Field Equipment

The ability to collect valid samples requires that field equipment be appropriately cleaned and maintained. Field equipment will be maintained through following the procedures provided in Section 5.0 of the CGMSAP.

10.2 Laboratory Equipment

The ability to generate valid analytical data requires that analytical instrumentation be properly maintained. The laboratory will be responsible for appropriate maintenance for major instruments. The elements of an effective maintenance program are identified below and discussed in the following subsection:

- Instrument maintenance logbooks
- Instrument maintenance and repair
- Available spare parts

10.2.1 Instrument Maintenance Logbooks

Each analytical instrument will be assigned an instrument logbook. Maintenance activities will be recorded in the instrument logbook and the information entered will include:

- Date of service
- Person performing the service
- Type of service performed and reason for service
- Replacement parts installed (if applicable)
- Miscellaneous information

If service is performed by the manufacturer or its representative, a copy of the service record will be inserted into the page facing the logbook page where the above cited-information has been entered.

10.2.2 Instrument Calibration and Maintenance

An overview of the routine calibration procedures used for analytical instrumentation is presented in Section 6.0. Preventive maintenance and calibration by manufacturer service representatives will be provided on a routine basis.

In addition to maintenance by manufacturer service representatives, procedures for routine maintenance in accordance with manufacturer specifications for each analytical instrument will be followed by the laboratory. This maintenance includes maintaining inventories of spare parts used routinely (*e.g.*, vacuum pumps and filaments for GC/MS and spare torches for ICP/MS). Instrument operators have the responsibility to ensure that an acceptable inventory of spare parts is maintained.

11.0 DATA ASSESSMENT PROCEDURES

The overall QA objective for field activities, data analyses, and laboratory analyses is to produce data of sufficient and known quality to provide consistent data to enhance the understanding of groundwater conditions at the Site. Specifically, data will be developed using procedures appropriate for the intended use.

Standard procedures are used so that data of known accuracy, precision, representativeness, completeness, and comparability will be generated for each data set. Descriptions of these criteria are presented in the following subsections.

The specific QA/QC objectives for this Project are summarized on Tables 1, 2, 3, 4, 5, and 6.

11.1 Precision

The degree of agreement between the numerical values of a set of duplicate samples performed in an identical fashion constitutes the precision of the measurement.

During the collection of data using field methods and/or instruments, precision is checked by reporting measurements at one location and comparing results. For example, measurements are taken in pairs at a certain well and the values compared. The measurements are considered sufficiently precise only if the values are within a specified percentage of each other.

Analytical precision is calculated by expressing, as a percentage, the relative percent difference (RPD) between results of analyses of laboratory duplicate samples for a given analyte. Precision is expressed by the following formula:

$$RPD = \frac{(C_1 - C_2)}{((C_1 + C_2)/2)} \times 100$$

Where: C_1 = Value of original sample
C_2 = Value of duplicate sample

Specific precision objectives for laboratory duplicate samples, including MSDs, are presented on Tables 4, 5, and 6.

For aqueous field duplicate samples, the evaluation criterion is 20% RPD if both results are greater than or equal to 5× the reporting limit; the difference must be less than the reporting limit if at least one of the results is < 5× the reporting limit.

11.2 Accuracy

Accuracy is the degree of agreement of a measurement, X, with an accepted reference or true value, T. Accuracy is usually expressed as the difference between the two values, X-T, or the difference as a percentage of the reference or true value, 100(X-T)/T; accuracy is also sometimes expressed as a ratio X/T. Accuracy, which is a measure of the bias in a system, is

assessed by means of reference samples and percent recoveries. Error may arise due to personal, instrumental, or method factors.

The two types of analytical check samples are laboratory control samples and matrix spike samples. Analytical accuracy is expressed as the percent recovery of an analyte that has been added to the control sample or a standard matrix (*e.g.*, blank soil) at a known concentration prior to analysis.

The formula used to calculate accuracy for the laboratory control sample is:

$$\text{Accuracy} = \%\ \text{Recovery} = (A^T/A^F) \times 100$$

Where: A^T = The total concentration of the analyte measured or recovered.
A^F = The concentration of the analyte spiked.

When calculating accuracy in the matrix spike analysis, a correction for background concentration found in the unspiked sample must be made. The formula is:

$$\text{Accuracy} = \%\ \text{Recovery} = \frac{A^T - A^O}{A^F} \times 100$$

Where: A^T = The concentration of the analyte measured or recovered.
A^O = The unspiked concentration of the analyte.
A^F = The concentration of the analyte spiked.

In general, the accuracy objectives are based on the analytical method as indicated on Tables 4, 5, and 6.

11.3 Completeness

Completeness is a measure of the degree to which the amount of sample data collected meets the needs of the sampling program and is quantified as the relative number of analytical data points that meet the acceptance criteria (including accuracy, precision, and any other criteria required by the specific analytical method used). Completeness is defined as a comparison between actual numbers of usable data points expressed as a percentage of expected number of points.

The QA objectives for completeness will be based upon QA protocols. The ability to meet or exceed this completeness objective is dependent on the nature of samples submitted for analysis. If data cannot be reported without qualification, project completion goals may still be met if the qualified data (*i.e.,* data of known quality, even if not perfect) are suitable for specified project goals. Percent completeness will be expressed as the ratio of the total number of usable results relative to the total number of analytical results. The total number of usable analytical results will be the total number of results minus any results that are rejected during data validation activities. The project goal for completeness is 90%.

11.4 Representativeness

Representativeness expresses the degree to which sample data are accurate and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter associated with the proper design of the sampling program. The representativeness criterion can, therefore, be met through the proper selection of sampling locations, the collection of a sufficient number of samples, and using US EPA-approved and standardized sampling procedures to describe sampling techniques and the rationale used to select sampling locations to ensure representativeness of the sample data.

Representativeness will also be measured by the collection of field duplicates, as appropriate. Comparison of the analytical results from field duplicates will provide a direct measure of individual sample representativeness.

11.5 Comparability

Comparability is a qualitative parameter used to express the confidence with which one data set can be compared with another. The comparability of the data, a relative measure, is influenced by sampling and analytical procedures. By providing specific protocols for obtaining and analyzing samples, data sets should be comparable regardless of who collects the sample or who performs the sample analysis.

The laboratory will be responsible for enhancing comparability by using the following controls:

- Adherence to current, standard US EPA-approved methodology for sample preservation and analysis.
- Compliance with holding times and analysis consistent with this QAPP.
- Consistent reporting units for each parameter of similar matrices.
- NIST-traceable standards, when applicable.

11.6 Reconciliation With Data Quality Objectives

The Field Technical Services Project Manager in conjunction with the QA Oversight Manager will determine whether field and validated analytical data or data sets meet the requirements necessary for decision-making. The results of measurements will be compared to the goals and requirements set forth in this QAPP. As data are evaluated, anomalies in the data or data gaps may become apparent to the data users. Data that do not meet the data users' needs will be identified and appropriately noted so that decision-makers are aware of data limitations. The process of reconciling project data with the DQOs will be performed with guidance from the Guidance for Data Quality Assessment, Practice Methods for Data Analysis (US EPA QA/G-9, July 2000).

12.0 FEEDBACK AND CORRECTIVE ACTION

Responsibilities for feedback and corrective action for the field team are described in Section 5.8 of the CGMSAP. Responsibilities for the laboratory are described in this section.

12.1 Feedback Mechanism

There are mechanisms within the Project structure that allow for the identification, feedback, and control of any nonconformances or deficiencies. In general, the technical personnel involved with the project are responsible for reporting suspected technical nonconformances through standard communication channels established by the organizational structure. In the same manner, Project personnel are responsible for reporting suspected QA nonconformances.

12.2 Corrective Action

The laboratory has the responsibility to monitor the quality of the analytical system. The laboratory will verify that QC procedures are followed and that the analytical results of QC samples are within the acceptance criteria. The verification requires that the laboratory assess the correctness of the following items, as appropriate:

- Sample preparation procedure
- Initial calibration
- Calibration verification results
- ICP/MS interference check sample results
- Method blank result
- LCS results
- MS/MSD results
- Surrogate recoveries
- Internal standard performance

If the assessment reveals that the QC acceptance criteria are not met, the laboratory must immediately evaluate the analytical system and correct the problem. The analyst will notify the Laboratory Project Manager and Laboratory QA Coordinator of the problem and, if possible, will identify potential causes and suggest correct action. Figure 12-1 presents the pathway for corrective actions (page 32).

The nature of the corrective action obviously depends on the problem. For example, if a continuing calibration verification standard is determined to be out-of-control, the corrective action may require recalibration of the analytical system and reanalysis of all samples analyzed since the last acceptable continuing calibration standard.

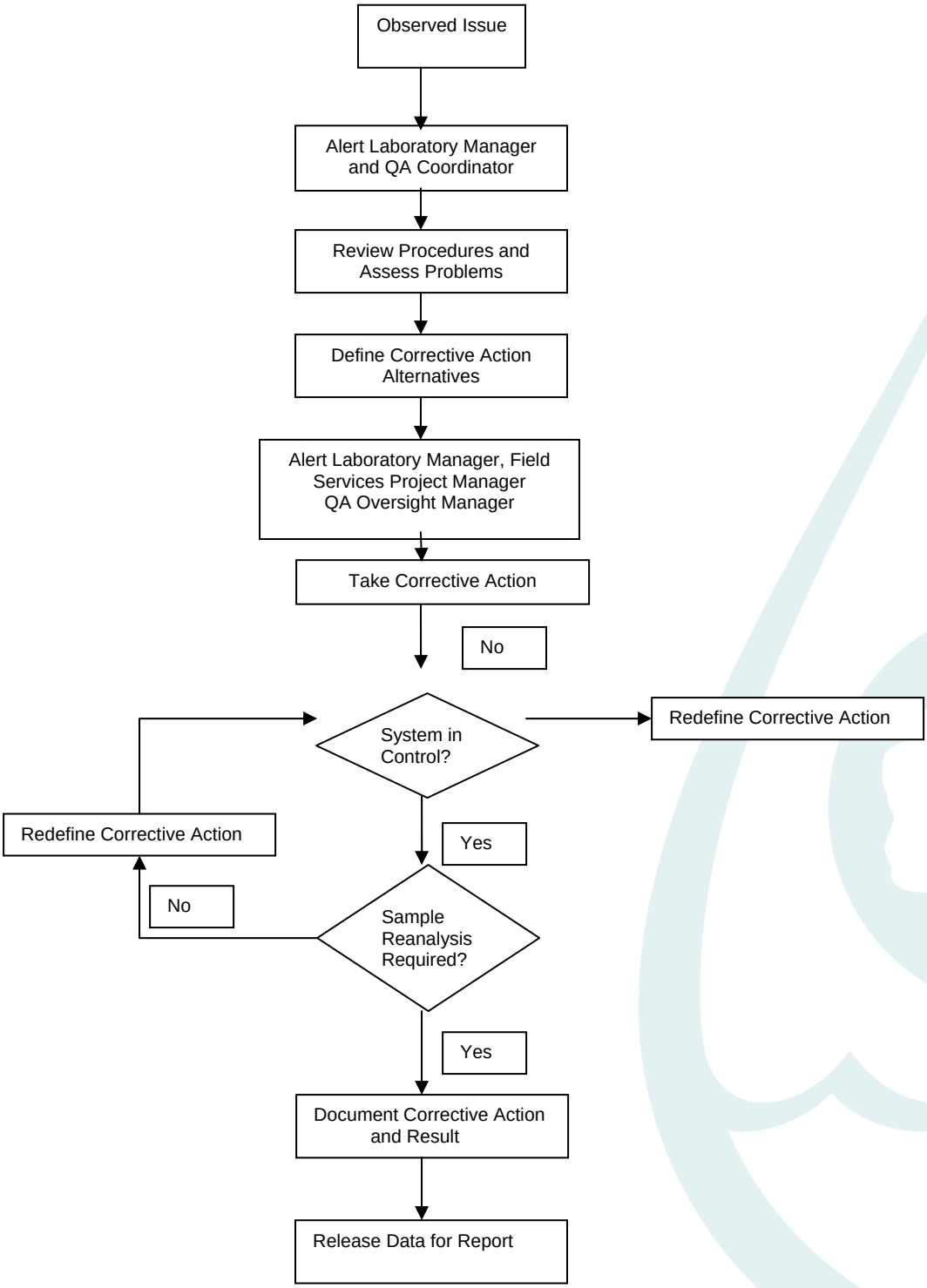
When the appropriate corrective action measures have been implemented and the analytical system is determined to be “in control,” the analyst will document the problem, the corrective action taken, and resultant data demonstrating that the analytical system is in control. Copies of

the documentation will be provided to the Laboratory Project Manager, the Laboratory QA Coordinator, the Field Technical Services Project Manager, and the QA Oversight Manager.

Data generated concurrently with an out-of-control system will be evaluated for usability relative to the nature of the deficiency. If the deficiency does not impair the usability of the results, data will be reported and the deficiency will be addressed in the Case Narrative. If sample results are impaired, the Laboratory Project Manager and Field Technical Services Project Manager will be notified and appropriate corrective action (*e.g.*, reanalysis) will be taken.

The specific approach to corrective action procedures for laboratory instruments will be those contained in the procedures specified in the laboratory quality assurance plan necessary to meet the DQOs of this QAPP.

Figure 12-1 Critical Path for Laboratory Corrective Action



13.0 QUALITY ASSURANCE REPORTS

13.1 Field QA Reports

The requirements for field QA reporting are provided in Section 5.7.3 of the CGMSAP.

13.2 Laboratory QA Reports

The laboratory QA Coordinator will immediately notify the Field Technical Services Project Manager and QA Oversight Manager of any laboratory QA situations that require corrective action.

13.3 Data Submittals

The electronic data deliverable and full data packages will summarize the deviations from approved protocols and significant data findings in the Case Narratives. The laboratory will provide the data packages to Field Service Project Manager. The Field Technical Services Project Manager will provide a report for delivery to Beazer and US EPA Region IV.

Electronic and hardcopy data will be archived for a minimum of 5 years from the date of reporting.

14.0 References

US EPA (US Environmental Protection Agency). EPA Requirements for Quality Assurance Project Plans. EPA QA/R-5. Office of Environmental Information. Washington, DC, November 2002.

US EPA (US Environmental Protection Agency). EPA Guidance on Systematic Planning Using the Data Quality Objectives Process. US EPA QA/G-4. Office of Environmental Information. Washington, DC, February 2006.

US EPA (US Environmental Protection Agency). US EPA CLP National Functional Guidelines for Organic Data Review, USEPA-540-R-08-1. Washington, DC, June 2008.

US EPA (US Environmental Protection Agency). US EPA Guidance on Environmental Data Validation, US EPA QA/G-8. Washington, DC, December 2004.

US EPA (US Environmental Protection Agency). US EPA Guidance for Data Quality Assessment, Practice Methods or Data Analysis. USEPA QA/G-9. Washington, DC, July 2000.

US EPA (US Environmental Protection Agency). US EPA SW-846 Test Methods for Evaluating Solid Waste, Physical and Chemical. 3rd Edition including Final Update III. Washington, DC, December 1996.

US EPA (US Environmental Protection Agency). US EPA 40 CFR Part 136 Final Methods Update. Washington, DC, March 2008.

US EPA (US Environmental Protection Agency). US EPA CLP National Functional Guidelines for Inorganic Data Review. Washington, DC, October 2004.

TABLES

Table 1
Metals Analyses QA/QC Table
SW-846 Method 6020

Procedure	Frequency	Acceptance Criteria	Corrective Action
Tune	Analyze once every 12 hours before instrument calibration.	Resolution and mass calibration meet method requirements.	Terminate analysis, correct problem, retune.
Initial Calibration	Every 24 hours. At a minimum, the initial calibration consists of a blank and a mid-level standard or a three-point curve and a blank with the lowest non-zero standard at the reporting limit (RL)	Both curves are verified with the ICV and LLICV standards described below. The correlation coefficient (r) for a three-level curve calibration must be $\geq$ .990.	1. Evaluate system. 2. Correct system and recalibrate. Criteria must be met before sample analysis may begin.
Initial Calibration Verification (ICV)	Once per 24 hours and each time the instrument is calibrated. Immediately after instrument calibration, the ICV and initial calibration blank (ICB) are analyzed.	ICV within 90% - 110% recovery.	1. Reanalyze once. 2. Terminate analysis, correct problem, and recalibrate Instrument.
Low Limit Initial Calibration Verification (LLICV)	After the analysis of the daily ICV and ICB, a LLICV must be analyzed.	LLICV is within 50% - 150% recovery. This must be at the MDL.	1. Reanalyze once. 2. Terminate analysis, correct problem, and recalibrate instrument.
Continuing Calibration Verifications. (CCV)	Analyzed after every 10 samples and at the end of the analytical batch.	Recovery of CCV between 90% - 110%.	1. Reanalyze once. 2. If CCV does not meet criteria, terminate analysis, correct problem, and recalibrate instrument. Reanalyze all project samples since the last compliant CCV. Exception: If arsenic is out high in the CCV and not detected in the project samples, samples can be reported.
Internal Standards	Internal standards responses monitored	Between 30% - 120% of the corresponding internal standard in the mid-level standard of the initial calibration.	Reanalyze samples if only samples are affected (dilution may be necessary to bring responses within criteria). If CCV or CCB is affected, stop analysis and correct problem and reanalyze samples as necessary.

Table 1 (cont.)
Metals Analyses QA/QC Table
SW-846 Method 6020

Procedure	Frequency	Acceptance Criteria	Corrective Action
Initial Calibration Blank/ Continuing Calibration Blank	ICB analyzed at beginning of sequence, CCB analyzed after every 10 samples and at the end of the sequence.	Absolute value of analytes < RL.	1. Reanalyze once. 2. If ICB or CCB still does not meet criteria, terminate analysis, correct problem, and recalibrate instrument. Reanalyze all project samples since last compliant CCB. Exception: If concentration of arsenic in associated samples is greater than 10× the absolute value of the ICB/CCB, report results and narrate in Case Narrative.
Interference Check Samples (ICSA and ICSAB)	Analyze at the beginning and end of each analytical batch.	1. Recovery of Arsenic in ICSAB within 80% - 120%. 2. Concentration of Arsenic in ICSA must be < the RL.	1. Reanalyze once 2. Terminate analysis, correct problem, and recalibrate Instrument. Reanalyze all project samples bracketed.
Preparation Blank	One per digestion batch of ≤ 20 samples per batch. Must undergo all sample preparative procedures and analysis.	Less than the RL.	1. All samples with positive results less than or equal to 10-times the preparation blank concentration must be re-digested and reanalyzed. 2. Samples with no positive results for the analyte present in the preparation/ method blank or with a concentration greater than 10× the method blank concentration are acceptable. Narrate in Case Narrative.
Laboratory Control Sample (LCS)	One per batch of ≤ 20 samples. Must undergo all sample preparative procedures and analysis.	See Table 8 for acceptance limits.	1. LCS may be analyzed once. 2. All project samples have to be re-prepared and reanalyzed.
MS/MSD (pre-digestion)	One project sample per batch of ≤ 20 samples. Must undergo all sample preparative procedures and analysis.	See Table 8 for acceptance limits. Not applicable if sample concentration is > 4× spike added.	1. Perform a post-digestion spike. 2. Narrate in Case Narrative.
Post-Digestion Spike	Perform if MS fails.	The acceptance for post-digestion spike is ± 20% of the known value.	1. Evaluate Data 2. Dilute sample, re-spike and analyze.

Table 1 (cont.)
Metals Analyses QA/QC Table
SW-846 Method 6020

Procedure	Frequency	Acceptance Criteria	Corrective Action
Serial Dilution (1:5)	Perform serial dilution if post-digestion spike recoveries are outside of ± 20% acceptance range.	If the undiluted result is > 50× the MDL, the 1:5 dilution within 10% of undiluted value.	1. Evaluate analyses 2. Narrate in Case Narrative.

Table 2
Semivolatile Analyses QA/QC Table
SW-846 Method 8270C

Procedure	Frequency	Acceptance Criteria	Corrective Action
DFTPP Mass Spectrometer Tune (50 ng or less)	Analyze at the start of each 12- hour period before ICAL or CCV.	1. Resolution and ion abundance criteria meet method requirements. 2. Tailing factor for pentachlorophenol is < 5.0.	1. Retune 2. Do not proceed with analysis until DFTPP meets ion abundance and tailing factor criteria.
Initial Calibration	Establish initially with a minimum of 5 different concentration levels.	The %RSD should be ≤ 15 if average response factor is to be used for quantitation. If regression model is applied, r must be ≥ 0.995.	1. Evaluate system; ensure same dwell times and secondary ions are applied to all standards and QC and project samples. 2. Correct system and recalibrate. Criteria must be met before sample analysis may begin. 3. Primary and secondary ion ratios must be within QC limits. Dwell time, RT, and RRT must be same for all calibration, QC, and project sample analysis.
Initial Calibration Verification (ICV)	After Initial Calibration at mid-range of calibration.	% Difference ≤ 20% for all target analytes.	1. Evaluate system. 2. Reanalyze once. 3. Retune and recalibrate if necessary. Do not proceed with analysis until ICV recovery is in control.
Continuing Calibration Verification (CCV)	After tune, if initial calibration is not necessary.	1. % Difference is ≤ 20% for all target analytes. 2. Internal standard area counts must be within 50% to 200% of the middle level concentration of most recent initial calibration. 3. Internal standard retention times must be within 30 seconds of the middle level concentration of the most recent calibration.	1. Evaluate system. 2. Reanalyze once. 3. Retune and recalibrate if necessary. Do not proceed with analysis until CCV acceptance criteria are met.
Laboratory Control Sample (LCS)	One per batch of ≤ 20 samples. Must undergo all preparative procedures. Analyze prior to the analysis of blank and project samples.	See Table 9 for limits.	If concentration falls outside of the limits, the extraction/concentration processes are out-of-control. The extraction batch has to be repeated and all relevant QC and project samples have to be re-extracted. Exception: If target recoveries are greater than acceptance limits and no positive results were observed in the project samples, narrate in the Case Narrative.

Table 2
Semivolatile Analyses QA/QC Table
SW-846 Method 8270C

Procedure	Frequency	Acceptance Criteria	Corrective Action
Surrogate	Added to all project samples, blanks, and QC samples prior to extraction.	See Table 9 for limits.	1. Evaluate sample. 2. If recovery is high and no positive results in samples, narrate in Case Narrative. 3. Reextract and reanalyze to confirm matrix effect.
Internal Standards	Added to all project samples, blanks, and QC samples prior to analysis.	Area counts must be within 50% - 200% of the associated CCV.	1. Evaluate sample analysis. 2. Prepare a second aliquot of sample extract and reanalyze to Confirm matrix interference.
Method Blank	Prepared with each group of samples (samples started through the extraction process to a maximum of 20 samples)	Less than the RL.	1. All project samples with positive results less than or equal to 10× the method blank concentration must be re-extracted and analyzed. 2. Project samples with no positive result for the target detected in the method blank or with a concentration greater than 10× the method blank concentration are acceptable. Narrate in Case Narrative.
MS/MSD	One project sample per batch of ≤ 20 samples per 12-hour shift. Must undergo all preparative procedures.	See Table 9 for limits.	1. Evaluate, confirm matrix effects. 2. Flag data, narrate in Case Narrative.
Qualitative/Quantitative Issue	If instrument level of any compound in a sample exceeds the instrument level of that compound in the highest level standard, the sample must be diluted to approximately mid-level of the calibration range and reanalyzed.	The instrument level of all compounds must be within the upper calibration range for all samples.	Dilute the sample to bring the level of the highest concentration of target compounds with the calibration range.

Table 3
Volatile Analyses QA/QC Table
SW-846 Method 8260B

Procedure	Frequency	Acceptance Criteria	Corrective Action
BFB Mass Spectrometer Tune (50 ng)	Analyze at the start of each 12-hour period before ICAL or CCV.	Resolution and ion abundance criteria meet method requirements.	1. Retune. 2. Do not proceed with analysis until BFB meets ion abundance criteria.
Initial Calibration	Establish initially with a minimum of 5 different concentration levels.	The %RSD should be ≤ 15 if average response factor is to be used for quantitation. If regression model is applied, r must be ≥ 0.995.	1. Evaluate system; ensure same dwell times and secondary ions are applied to all standards and QC and project samples. 2. Correct system and recalibrate. Criteria must be met before sample analysis may begin. 3. Primary and secondary ion ratios must be within QC limits. Dwell time, RT, and RRT must be same for all calibration, QC, and project sample analysis.
Initial Calibration Verification (ICV)	After Initial Calibration at mid-range of calibration.	% Difference ≤ 20% for all target analytes.	1. Evaluate system. 2. Reanalyze once. 3. Retune and recalibrate if necessary. Do not proceed with analysis until ICV recovery is in control.
Continuing Calibration Verification (CCV)	After tune, if initial calibration is not necessary.	1. % Difference is ≤ 20% for all target analytes. 2. Internal standard area counts must be within 50% to 200% of the middle level concentration of most recent initial calibration. 3. Internal standard retention times must be within 30 seconds of the middle level concentration of the most recent calibration.	1. Evaluate system. 2. Reanalyze once. 3. Retune and recalibrate if necessary. Do not proceed with analysis until CCV acceptance criteria are met.
Laboratory Control Sample (LCS)	One per batch of ≤ 20 samples. Must undergo all preparative procedures. Analyze prior to the analysis of blank and project samples.	See Table 10 for limits.	If concentration falls outside of the limits, the extraction/concentration processes are out-of-control. The extraction batch has to be repeated and all relevant QC and project samples have to be re-extracted. Exception: If target recoveries are greater than acceptance limits and no positive results were observed in the project samples, narrate in the Case Narrative.

Table 3
Volatile Analyses QA/QC Table
SW-846 Method 8260B

Procedure	Frequency	Acceptance Criteria	Corrective Action
Surrogate	Added to all project samples, blanks, and QC samples prior to extraction.	See Table 10 for limits.	1. Evaluate sample. 2. If recovery is high and no positive results in samples, narrate in Case Narrative. 3. Re-extract and reanalyze to confirm matrix effect.
Internal Standards	Added to all project samples, blanks, and QC samples prior to analysis.	Area counts must be within 50% - 200% of the associated CCV.	1. Evaluate sample analysis. 2. Prepare a second aliquot of sample extract and reanalyze to confirm matrix interference.
Method Blank	Prepared with each group of samples to a maximum of 20 samples	Less than the RL.	1. All project samples with positive results less than or equal to 10× the method blank concentration must be re-extracted and analyzed. 2. Project samples with no positive result for the target detected in the method blank or with a concentration greater than 10× the method blank concentration are acceptable. Narrate in Case Narrative.
MS/MSD	One project sample per batch of ≤20 samples per 12-hour shift. Must undergo all preparative procedures.	See Table 10 for limits.	1. Evaluate, confirm matrix effects. 2. Flag data, narrate in Case Narrative.

Table 3
Volatile Analyses QA/QC Table
SW-846 Method 8260B

Procedure	Frequency	Acceptance Criteria	Corrective Action
Qualitative/Quantitative issue	1. If instrument level of any compound in a sample exceeds the instrument level of that compound in the highest level standard, the sample must be diluted to approximately mid-level of the calibration range and reanalyzed. 2. A sample with a target compound concentration between the reporting limit but ≤ 5× the reporting limit immediately follows a sample which had a the concentration of the target analyte that exceeded the calibration range, then the sample following the high-level sample must be reanalyzed to determine if carryover occurred.	1. The instrument level of all compounds must be within the upper calibration range for all samples. 2. The sample analyzed immediately after a high-level sample must display concentrations less than the reporting limit or > 5 × the reporting limit.	1. Dilute the sample to bring the level of the highest concentration of target compounds with the calibration range. 2. A sample displaying concentrations of target compounds between the reporting limit and 5× the reporting limit that was analyzed immediately after a high-level sample must be reanalyzed. If the results do not agree within the reporting limit, report only the second analysis.

TABLE 4

Summary of Precision and Accuracy Objectives for Laboratory QC Samples

Metals Analyses by SW-846 Method 6020

Parameter	Method	Matrix	MS/MSD Accuracy (% Recovery)	MS/MSD Precision (RPD)	LCS Precision (% Recovery)
Metals	6020	Aqueous	75-125	20	75-125

Table 5

**Summary of Precision and Accuracy Objectives
For Laboratory QC Samples**

Semivolatile Analyses by SW-846 Method 8270C

Target	Method	Matrix	MS/MSD Accuracy % Recovery	MS/MSD Precision RPD	LCS Accuracy % Recovery
2,4-Dimethylphenol	8270C	Aqueous	50-150	30	60-140
2-Methylnaphthalene	8270C	Aqueous	50-150	30	60-140
2-Methylphenol	8270C	Aqueous	50-150	30	60-140
4-Methylphenol	8270C	Aqueous	50-150	30	60-140
Acenaphthene	8270C	Aqueous	50-150	30	60-140
Acenaphthylene	8270C	Aqueous	50-150	30	60-140
Anthracene	8270C	Aqueous	50-150	30	60-140
Carbazole	8270C	Aqueous	50-150	30	60-140
Dibenzofuran	8270C	Aqueous	50-150	30	60-140
Fluoranthene	8270C	Aqueous	50-150	30	60-140
Fluorene	8270C	Aqueous	50-150	30	60-140
Naphthalene	8270C	Aqueous	50-150	30	60-140
Pentachlorophenol	8270C	Aqueous	50-150	30	60-140
Phenanthrene	8270C	Aqueous	50-150	30	60-140
Phenol	8270C	Aqueous	50-150	30	60-140
Pyrene	8270C	Aqueous	50-150	30	60-140
Surrogates[1]:			% Recovery		
2,4,6-Tribromophenol	8270C	Aqueous	30-150		
2-Fluorobiphenyl	8270C	Aqueous	30-150		
2-Fluorophenol	8270C	Aqueous	30-150		
Fluoranthene-d_{10}	8270C	Aqueous	30-150		
Fluorene-d_{10}	8270C	Aqueous	30-150		
Nitrobenzene-d_5	8270C	Aqueous	30-150		
Phenol-d_6	8270C	Aqueous	30-150		
Terphenyl-d_{14}	8270C	Aqueous	30-150		

Notes:

[1] - The laboratory may utilize alternative surrogate compounds; however, the limits of 30% - 150% will be utilized for surrogates to assess data usability for this project.

Table 6

Summary of Precision and Accuracy Objectives For Laboratory QC Samples

Volatile Analyses by SW-846 Method 8260B

Target	Method	Matrix	MS/MSD Accuracy % Recovery	MS/MSD Precision RPD	LCS Accuracy % Recovery
Benzene	SW-846 8260B	Aqueous	70-130	30	70-130
Ethylbenzene	SW-846 8260B	Aqueous	70-130	30	70-130
Toluene	SW-846 8260B	Aqueous	70-130	30	70-130
Xylene, total	SW-846 8260B	Aqueous	70-130	30	70-130
Surrogates[1]:			% Recovery		
Dibromofluoromethane	SW-846 8260B	Aqueous	70-130		
1,2-Dichloroethane-d_4	SW-846 8260B	Aqueous	70-130		
Toluene-d_8	SW-846 8260B	Aqueous	70-130		
4-Bromofluorobenzene	SW-846 8260B	Aqueous	70-130		

Notes:

[1] - The laboratory may utilize alternative surrogate compounds; however, the limits of 70% - 130% will be utilized for surrogates to assess data usability for this project.

APPENDIX A

Appendix A

Data Package Deliverables

All hardcopy data packages will be supplied to Beazer as an indexed and searchable (OCR formatted) PDF file on CD or DVD media. The following sections describe in detail the type of data package for this project; the data package detailed has been developed for non-Contract Laboratory Program Methods. The US EPA CLP SOW has additional details concerning data packages that are specific to CLP analyses. The most recent Statement of Work should be referenced for details concerning CLP-style data packages. Note: the summary forms provided in these data packages should be in similar format and content to the CLP forms listed (as references) next to the form title. These CLP forms references are only provided as guidance on content and format and should be modified by the laboratory to meet method requirements.

1.0 Data Package Contents and Order of Presentation

The laboratory will be required to submit supporting documentation for the reported analytical results. The supporting documentation and the analytical results will be required to be reported in the data package deliverable below. The data package deliverables format must be submitted in the order in which the deliverables appear in the text.

2.0 Format for Data Package Deliverables

The Data Package will include data for analyses of all samples in one Sample Delivery Group (SDG), including field samples, reanalyses, secondary dilutions, blanks, LCSs, MS/MSDs, and/or laboratory duplicates. The Sample Data Package must be complete before submission and must be consecutively paginated. The Sample Data Package will be arranged in the following order:

A) Cover Letter/Letter of Transmittal

B) Title Page

C) Table of Contents

D) Case Narrative

This document shall be clearly labeled “SDG Narrative” and shall contain: laboratory name, SDG number, Beazer sample identifications, laboratory sample numbers, and detailed documentation of any QC, sample, shipment, and/or analytical problems encountered in processing (preparing and analyzing) the samples reported in the data package. A glossary of qualifier codes used in the SDG must also be provided.

The laboratory must also include reference to preparation and analytical methods performed and applicable project documents (*i.e*., QAPP), any problems encountered, both technical and administrative, corrective actions taken and resolution, and an explanation of all flagged edits (*i.e*., exhibit edits) on quantitation reports (including results flagged due to storage blank contamination).

Additionally, the SDG Narrative must be signed and dated by the laboratory manager or his designee. The SDG Narrative must include a statement or statements relative to compliance with this document and any applicable project documents and description of any deviations from these documents.

E) Field and Internal (Laboratory) Chain-of-Custody Records, Sample Receipt Documentation Log, and all Project Correspondence.

Copies of both the external and internal Chain-of-Custody Records for all samples within the SDG must be included in the deliverables. The Chain-of-Custody Records or sample receipt documentation will list all pH measurements for all samples requiring pH adjustment for preservation.

F) GC/MS Volatile Organic Data

1. QC Summary.

a. Surrogate Percent Recovery Summary (modified CLP SOW Form II VOA).

b. Matrix Spike/Matrix Spike Duplicate Summary (modified CLP SOW Form III VOA).

c. LCS Summary (modified CLP SOW Form III VOA).

d. Method Blank Summary (modified CLP SOW Form IV VOA) -- arranged in chronological order by date of analysis of the blank, by instrument.

e. GC/MS Tuning and Mass Calibration Summary (modified CLP SOW Form V VOA) -- arranged in chronological order, by instrument.

f. Internal Standard Area and Retention Time Summary (modified CLP SOW Form VIII VOA) -- arranged in chronological order, by instrument.

2. Sample Data

Sample data shall be arranged in packets consisting of the Analytical Results Summaries followed by the raw data for volatile samples. These sample packets should then be placed in increasing alphanumeric order by Beazer sample identification. The order of each sample packet is as follows:

a. Target Compound Results (modified CLP SOW Form I VOA).

b. Reconstructed total ion chromatogram (RIC) and quantitation reports.

c. Copies of raw spectra and copies of background-subtracted mass spectra of each target compound identified in the sample and corresponding background-subtracted target compound standard mass spectra.

3. Standards Data

a. Initial Calibration Data (modified CLP SOW Form VI VOA and associated volatile standard reconstructed ion chromatograms and quantitation reports) -- for all initial calibrations associated with analyses in the SDG, in chronological order, by instrument.

b. Continuing Calibration Data (modified CLP SOW Form VII VOA and associated volatile standard reconstructed ion chromatograms and quantitation reports) -- for all continuing calibrations associated with analyses in the SDG, in chronological order, by instrument.

4. Raw QC Data

a. For each GC/MS tuning and mass calibration (in chronological order, by instrument):

1. Bromofluorobenzene (BFB) bar graph spectrum.

2. BFB mass listing.

b. Method/Storage Blank Data - in chronological order, by instrument:

i. Target Compound Results (modified CLP SOW288 Form I VOA).

ii. RIC and quantitation reports.

iv. Copies of raw spectra and copies of background-subtracted mass spectra of each target compounds identified in the blank and corresponding background-subtracted target compound standard mass spectra.

c. LCS Data:

i. Target Compound Results (modified CLP SOW288 Form I VOA).

ii. RIC and quantitation reports.

d. Matrix Spike Data:

i. Target Compound Results (modified CLP SOW288 Form I VOA).

ii. RIC and quantitation reports.

e. Matrix Spike Duplicate Data:

i. Target Compound Results (modified CLP SOW288 Form I VOA).

ii. RIC and quantitation reports.

f. Instrument sequence log – in chronological order by instrument. The sample pH measurements for each sample should be documented on the analytical sequence or provided as a separate summary form.

G) GC/MS Semivolatile Organic Data

1. QC Summary

a. Surrogate Percent Recovery Summary (modified CLP SOW Form II SV).

b. Matrix Spike/Matrix Spike Duplicate Summary (modified CLP SOW Form III SV).

c. LCS Summary (modified CLP SOW Form III SV).

d. Method Blank Summary (modified CLP SOW Form IV SV) -- arranged in chronological order by date of analysis of the blank, by instrument.

e. GC/MS Tuning and Mass Calibration Summary (modified CLP SOW Form V SV) -- arranged in chronological order, by instrument.

f. Internal Standard Area and Retention Time Summary (modified CLP SOW Form VIII SV-1, SV-2) -- arranged in chronological order, by instrument.

2. Sample Data

Sample data shall be arranged in packets consisting of the Analytical Results Summaries, followed by the raw data for semivolatile samples. These sample packets should then be placed in increasing alphanumeric order by Beazer sample identification. The order of each sample packet is as follows:

a. Target Compound Results (modified CLP SOW Form I SV-1, SV-2).

b. RIC and quantitation report.

c. Copies of raw spectra and copies of background-subtracted mass spectra of each target compound identified in the sample and corresponding background-subtracted target compound standard mass spectra.

3. Standards Data

a. Initial Calibration Data (modified CLP SOW Form VI SV-1, SV-2 and associated semivolatile standard reconstructed ion chromatograms and quantitation reports) -- for all initial calibrations associated with analyses in the SDG, in chronological order, by instrument.

b. Continuing Calibration Data (modified CLP SOW Form VII SV-1, SV-2 and associated semivolatile standard reconstructed ion chromatograms and quantitation reports) -- for all continuing calibrations associated with analyses in the SDG, in chronological order, by instrument.

4. Raw QC Data

a. For each GC/MS tuning and mass calibration (in chronological order, by instrument):

   i. Decafluorotriphenylphosphine (DFTPP) bar graph spectrum.

   ii. DFTPP mass listing.

b. Blank Data -- in chronological order, by instrument:

   i. Target Compound Results (modified CLP SOW Form I SV-1, SV-2).

   ii. TIC Results (modified CLP SOW Form I SV-TIC), if TIC searches are requested for any project sample.

   iii. RIC and quantitation reports.

   iv. Copies of raw spectra and copies of background-subtracted mass spectra of each target compound identified in the blank and corresponding background-subtracted target compound standard mass spectra.

c. LCS Data:

   i. Target Compound Results (modified CLP SOW Form I SV-1, SV-2).

   ii. RIC and quantitation reports.

d. Matrix Spike Data:

   i. Target Compound Results (modified CLP SOW Form I SV-1, SV-2).

   ii. RIC and quantitation reports.

e. Matrix Spike Duplicate Data

   i. Target Compound Results (modified CLP SOW Form I SV-1, SV-2).

   ii. RIC and quantitation reports.

H) Inorganic Data for Metals

1. Cover Page for the Inorganic Analyses Data Package.

2. Sample Results Summaries (modified CLP SOW Form I-INs) -- for all samples in the SDG, arranged in increasing alphanumeric order by Beazer sample identification.

3. QC and Quarterly Verification of Instrument Parameters Summaries:

   a. Initial and Continuing Calibration Verification summaries (modified CLP SOW Form II [PART 1]-INs).
   b. Low Level Calibration Verification Standards summaries (modified CLP SOW Form II [PART 2]-INs).

   c. Blanks summaries (modified CLP SOW Form III-INs).

   d. ICP/MS Interference Check Sample summaries (modified CLP SOW Form IV-INs).

   e. Matrix Spike Sample Recovery summary (modified CLP SOW Form V [PART 1]-IN).

   f. Post-Digest Spike Sample Recovery forms (modified CLP SOW Form V [PART 2]-IN).

   g. Laboratory Duplicates summary (modified CLP SOW Form VI-IN).

   h. LCS summary (modified CLP SOW Form VII-IN)

   i. Serial Dilution summary (modified CLP SOW Form IX-IN).

   j. Instrument Detection Limits (Quarterly) (modified CLP SOW Form X-IN).

   k. Interelement Correction Factors (Annually) (modified CLP SOW Form XI [PART 1]-IN).

   l. Linear Range Standard Summary (modified CLP SOW Form IV-LCIN).

   m. Preparation Logs (modified CLP SOW Form XIII-INs).

   n. Analytical Run Logs (modified CLP SOW Form XIV-INs).

o. ICP/MS Tuning and Response Factor Criteria (modified CLP SOW Form XIV-LCIN).

p. ICP/MS Internal Standards Summary (modified Form CLP SOW XV-LCIN).

4. Raw Data

For each reported value, the laboratory will provide all raw data used to obtain that value. This applies to all required QA/QC measurements and instrument standardization, as well as all sample analysis results. This statement does not apply to the Quarterly Verifications Parameters submitted as part of each data package. Raw data must contain all instrument readouts used for the sample results. Each exposure or instrumental reading must be provided, including those readouts that may fall below the MDL. All instruments must provide a legible hardcopy of the direct real-time instrument readout (stripcharts, printer tapes, *etc*.). A photocopy of the instrument's direct sequential readout must be included. A hardcopy of the instrument's direct instrument readout for cyanide must be included if the instrumentation has the capability.

APPENDIX B

SDG	KEY_ZONE	LOC_ALIAS	SAMPLE_ID	SAMPLE_T	CHEM_CLA	ANALYTE_N	SAMPLE_DATE
Example		Well	SMP	VOC	BENZENE		2/23/2009

LAB_RUN_DATE	MATRIX	AMOUNT	UNITS	MEASURE_	LAB_QUALI	METHOD	DETECTION	DATA_SOU
2/26/2009	WATER	0.52	UG/L		U	8260B	1	AppendixB

ANALYTE_CAS
71-43-2

APPENDIX D

Table D-1.
Well Construction Details -- Surficial Aquifer Wells

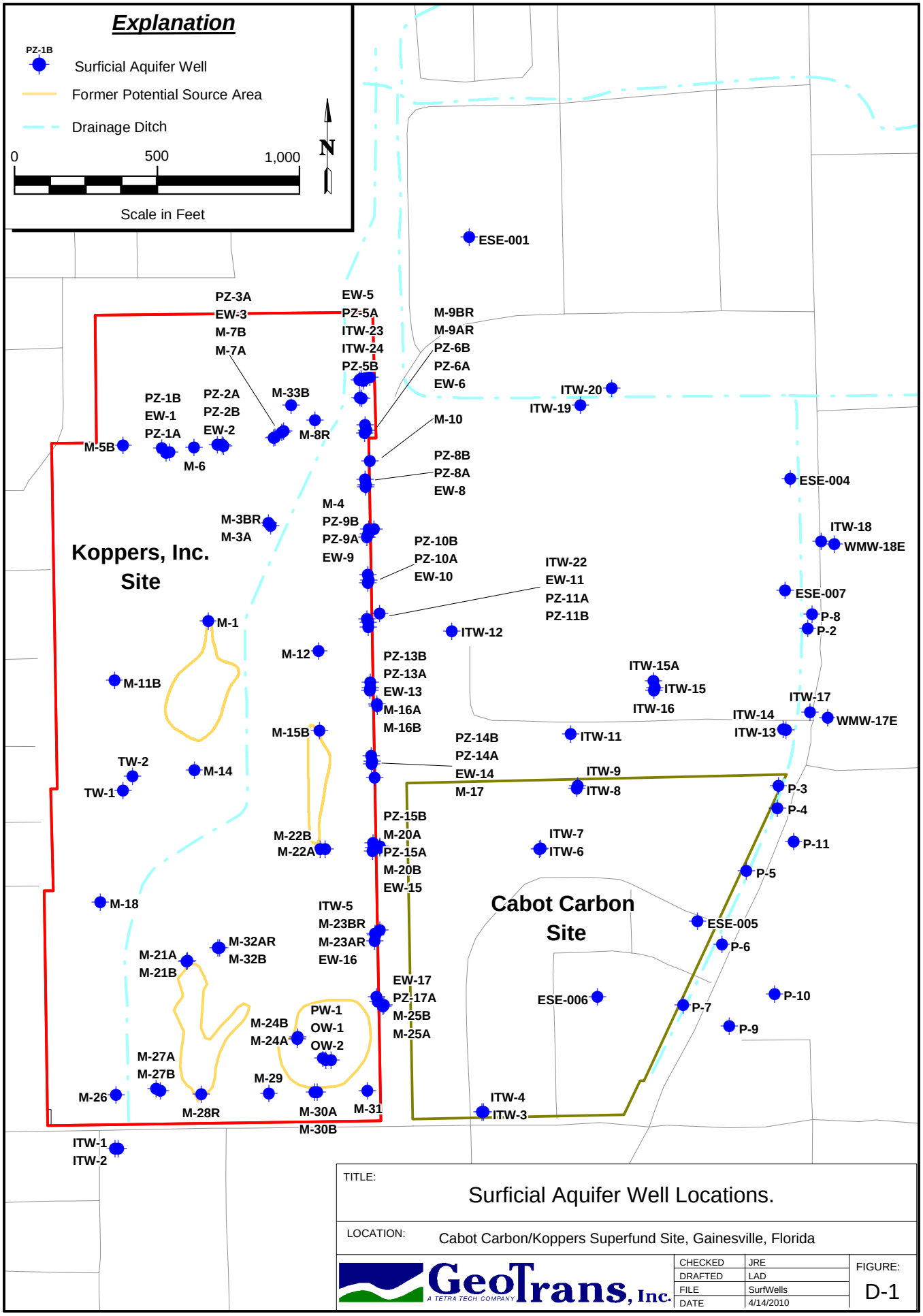
Well	Total Depth (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Casing Diameter (in)
ESE-001	23.4	6.5	21.2	2
ESE-004	27.1	6.5	21.5	2
ESE-005	29.9	9.5	29.5	2
ESE-006	29.7	7.5	27.5	2
ESE-007	25.1	7.5	22.5	2
EW-1	25.0	7.0	23.0	6
EW-2	25.0	7.0	23.0	6
EW-3	22.5	5.0	20.0	6
EW-5	25.0	8.0	23.0	6
EW-6	28.0	10.0	26.0	6
EW-8	26.0	8.0	24.0	6
EW-9	31.0	13.0	29.0	6
EW-10	27.0	9.0	25.0	6
EW-11	29.5	12.5	27.5	6
EW-13	28.5	10.0	26.5	6
EW-14	26.5	9.0	24.5	6
EW-15	27.0	9.0	25.0	6
EW-16	25.0	8.1	22.7	6
EW-17	27.0	9.0	25.0	6
ITW-1	25.0	15.0	25.0	2
ITW-2	16.0	5.0	15.0	2
ITW-3	26.0	15.0	25.0	2
ITW-4	15.0	5.0	15.0	2
ITW-5	24.0	18.0	23.0	2
ITW-6	30.0	27.0	17.0	2
ITW-7	18.5	8.5	18.5	2
ITW-8	30.0	18.0	28.0	2
ITW-9	18.0	8.0	18.0	2
ITW-10	Abandoned			
ITW-11	15.0	5.0	15.0	2
ITW-12	25.5	5.0	25.0	2
ITW-13	33.0	23.0	33.0	2
ITW-14	17.0	5.0	15.0	2
ITW-15	30.0	20.0	30.0	2
ITW-15A	30.0	20.0	30.0	2
ITW-16	22.0	12.0	22.0	2
ITW-17	31.3	11.3	31.3	2
ITW-18	33.0	12.0	32.0	2
ITW-19	30.0	10.0	30.0	2
ITW-20	30.0	10.0	30.0	2
ITW-21	Abandoned			
ITW-22	13.5	3.0	13.0	2
ITW-23	26.5	21.5	26.5	2
ITW-24	20.0	5.0	15.0	2
M-1	21.0	11.0	21.0	2
M-2	Missing			
M-3A	15.0	5.0	15.0	2
M-3BR	22.0	17.0	22.0	2
M-4	15.0	5.0	15.0	2
M-5A	Missing			
M-5B	26.5	21.5	26.5	2

Table D-1.
Well Construction Details -- Surficial Aquifer Wells

Well	Total Depth (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Casing Diameter (in)
M-6	15.0	5.0	15.0	2
M-7A	13.0	3.0	13.0	2
M-7B	21.5	16.5	21.5	2
M-8R	15.0	5.0	15.0	2
M-9AR	15.0	5.0	15.0	2
M-9BR	26.5	21.5	26.5	2
M-10	13.0	3.0	13.0	2
M-11A	Missing			
M-11B	23.5	18.5	23.5	2
M-12	13.0	3.0	13.0	2
M-13	Missing			
M-14	14.0	4.0	14.0	2
M-15A	Missing			
M-15B	23.5	18.5	23.5	2
M-16A	13.0	3.0	13.0	2
M-16B	21.5	16.5	21.5	2
M-17	13.0	3.0	13.0	2
M-18	13.0	3.0	13.0	2
M-19	Missing			
M-20A	13.0	3.0	13.0	2
M-20B	22.0	17.0	22.0	2
M-21A	13.0	3.0	13.0	2
M-21B	22.5	17.5	22.5	2
M-22A	15.0	5.0	15.0	2
M-22B	27.0	22.0	27.0	2
M-23AR	13.0	3.0	13.0	2
M-23BR	23.5	18.5	23.5	2
M-24A	15.0	5.0	15.0	2
M-24B	25.5	20.5	25.5	2
M-25A	13.0	3.0	13.0	2
M-25B	23.0	18.0	23.0	2
M-26	13.0	3.0	13.0	2
M-27A	13.0	3.0	13.0	2
M-27B	20.0	15.0	20.0	2
M-28R	13.0	3.0	13.0	2
M-29	13.0	3.0	13.0	2
M-30A	13.0	3.0	13.0	2
M-30B	23.0	18.0	23.0	2
M-31	13.0	3.0	13.0	2
M-32AR	13.0	3.0	13.0	2
M-32B	23.0	18.0	23.0	2
M-33B	27.3	22.3	27.3	2
OW-1	23.4	14.5	24.5	2
OW-2	25.2	15.0	25.0	2
P-2	10.2	5.2	10.2	?
P-3	10.0	5.0	10.0	?
P-4	10.0	5.0	10.0	?
P-5	11.7	6.7	11.7	?
P-6	12.5	7.5	12.5	?
P-7	12.5	7.5	12.5	?
P-8	10.0	5.0	10.0	?

Table D-1.
Well Construction Details -- Surficial Aquifer Wells

Well	Total Depth (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Casing Diameter (in)
P-9	15.0	10.0	15.0	?
P-10	15.0	10.0	15.0	?
P-11	15.0	10.0	15.0	?
PW-1	24.9	4.3	24.3	6
PZ-1A	25.0	15.0	25.0	2
PZ-1B	25.0	15.0	25.0	2
PZ-2A	24.0	14.0	24.0	2
PZ-2B	24.0	14.0	24.0	2
PZ-3A	24.0	14.0	24.0	2
PZ-5A	23.0	13.0	23.0	2
PZ-5B	25.0	15.0	25.0	2
PZ-6A	25.0	15.0	25.0	2
PZ-6B	25.0	15.0	25.0	2
PZ-8A	27.0	17.0	27.0	2
PZ-8B	27.5	17.5	27.5	2
PZ-9A	30.0	20.0	30.0	2
PZ-9B	30.0	20.0	30.0	2
PZ-10A	24.5	14.5	24.5	2
PZ-10B	24.5	14.5	24.5	2
PZ-11A	27.0	17.0	27.0	2
PZ-11B	27.0	17.0	27.0	2
PZ-13A	24.5	14.5	24.5	2
PZ-13B	24.5	14.5	24.5	2
PZ-14A	25.0	15.0	25.0	2
PZ-14B	25.0	15.0	25.0	2
PZ-15A	25.0	15.0	25.0	2
PZ-15B	25.0	15.0	25.0	2
PZ-17A	27.0	17.0	27.0	2
TW-1	23.0	3.0	23.0	2
TW-2	23.0	3.0	23.0	2
WMW-17E	31.2	9.0	29.0	?
WMW-18E	29.0	9.0	29.0	?



TITLE: Surficial Aquifer Well Locations.

LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

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FILE	SurfWells
DATE	4/14/2010

FIGURE: D-1

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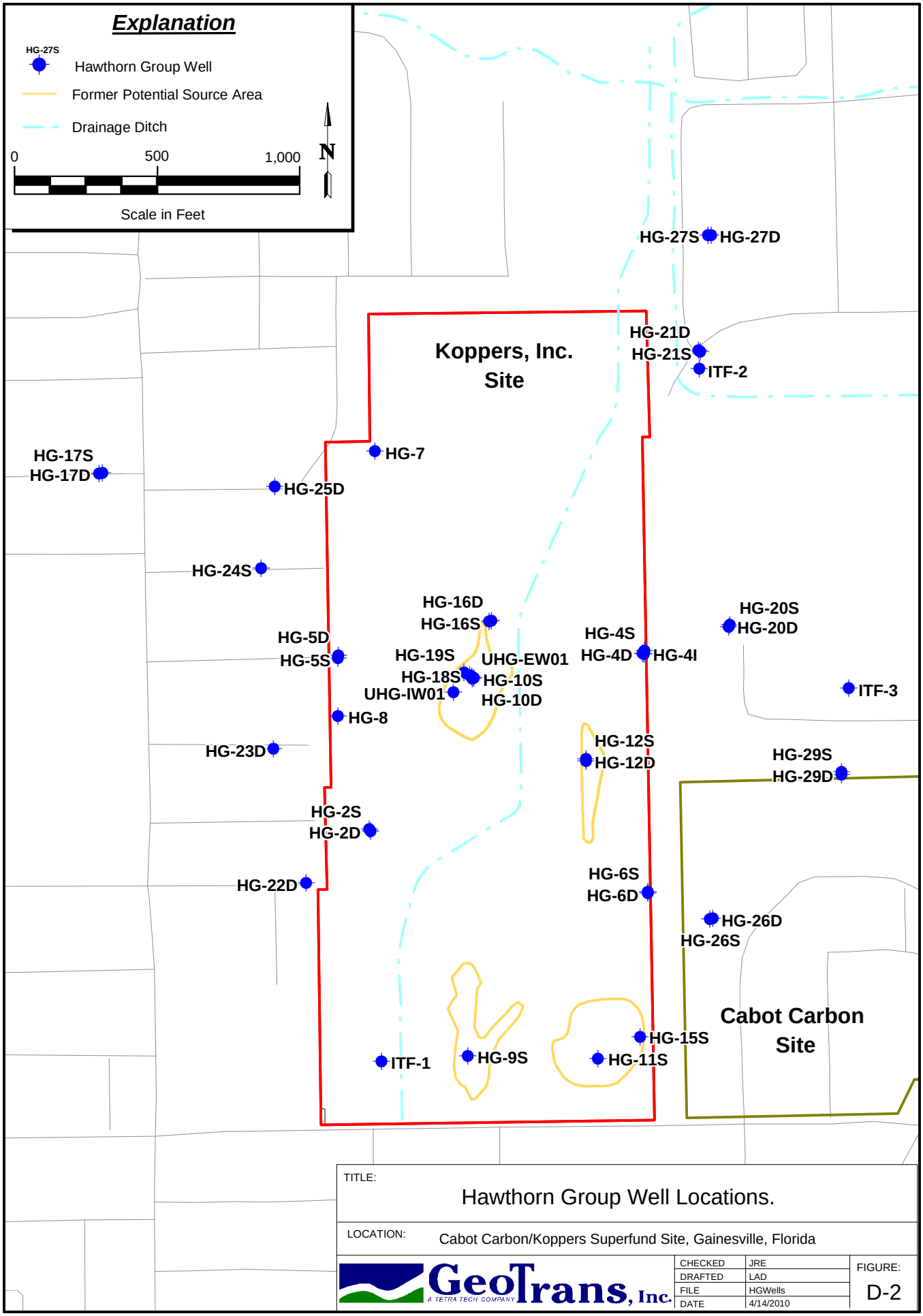
Table D-2.
Well Construction Details -- Hawthorn Group Wells

Well	Total Depth (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Casing Diameter (in)
HG-2D	115.0	100.0	110.0	2
HG-2S	50.0	40.0	50.0	2
HG-4D	105.0	95.0	105.0	2
HG-4I	85.0	75.0	85.0	2
HG-4S	50.0	40.0	50.0	2
HG-5D	110.0	100.0	110.0	2
HG-5S	50.0	40.0	50.0	2
HG-6D	105.0	95.0	105.0	2
HG-6S	50.0	40.0	50.0	2
HG-7	136.0	126.0	136.0	2
HG-8	135.0	125.0	135.0	2
HG-9S	68.0	26.0	36.0	2
HG-10D	124.0	102.5	112.5	2
HG-10S	61.5	51.0	61.0	2
HG-11S	71.0	47.0	57.0	2
HG-12D	123.0	106.5	116.5	2
HG-12S	62.0	51.0	61.0	2
HG-15S	75.0	64.0	74.0	2
HG-16D	117.4	105.0	115.0	2
HG-16S	62.5	62.0	52.0	2
HG-17D	105.0	95.0	105.0	2
HG-17S	55.0	45.0	55.0	2
HG-18S	60.0	48.1	58.1	2
HG-19S	60.0	47.6	57.6	2
HG-20S	44.0	30.0	40.0	2
HG-20D	84.3	74.1	84.1	2
HG-21S	41.4	31.2	41.2	2
HG-21D	95.3	85.0	95.0	2
HG-22D	82.0	72.0	72.0	2
HG-23D	90.0	79.8	89.8	2
HG-24S	72.0	61.8	71.8	2
HG-25D	86.2	75.9	85.9	2
HG-26S	44.6	34.4	44.4	2
HG-26D	94.4	84.2	94.2	2
HG-27S	61.0	51.0	61.0	2
HG-27D	96.8	86.8	96.8	2
HG-29S	55.8	45.8	55.8	2
HG-29D	97.0	87.0	97.0	2
ITF-1	85.8	69.0	79.0	2
ITF-2	82.2	71.0	81.0	2
ITF-3	91.0	69.5	79.5	2
UHG-EW01	62.0	54.0	59.0	18
UHG-IW01	56.0	33.0	53.0	4



TITLE: Hawthorn Group Well Locations.

LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

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FILE	HGWells
DATE	4/14/2010

FIGURE: D-2

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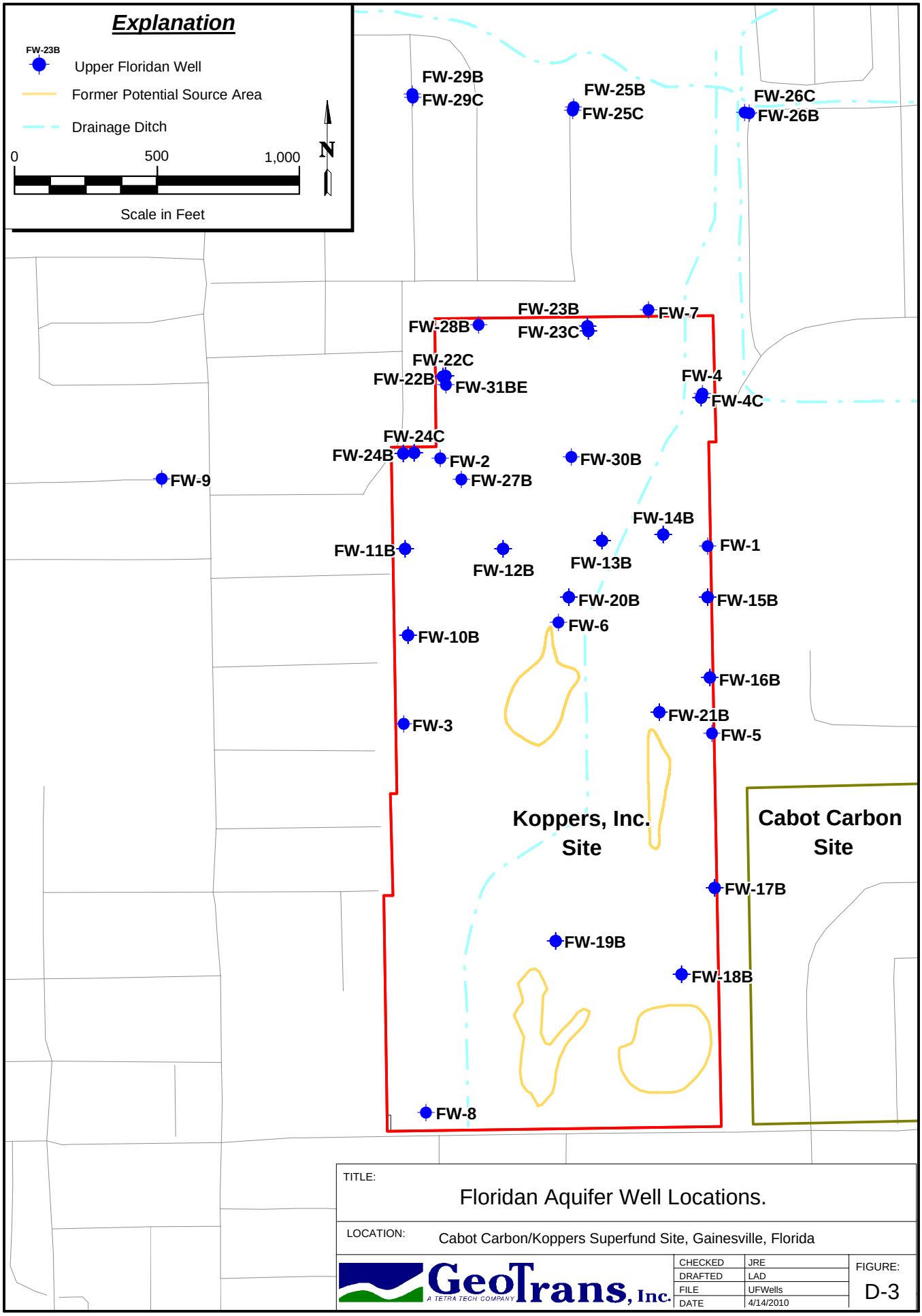
Table D-3.
Well Construction Details -- Upper Floridan Wells

Well	Total Depth (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Casing Diameter (in)
FW-1*	165.0	151.0	165.0	6
FW-2	156.0	146.0	156.0	2
FW-3	156.0	146.0	156.0	2
FW-4	155.5	146.0	155.0	2
FW-4C**	380.0	306.0	370.0	4
FW-5	156.0	146.0	155.5	2
FW-6	160.5	150.0	160.0	2
FW-7	155.0	145.0	155.0	2
FW-8	150.0	140.0	150.0	2
FW-9	155.0	145.0	155.0	2
FW-10B	237.9	152.2	222.4	4
FW-11B	237.1	152.1	221.7	4
FW-12B	239.7	155.5	225.2	4
FW-13B	239.3	154.3	224.0	4
FW-14B	240.7	155.6	225.3	4
FW-15B	238.8	154.6	224.2	4
FW-16B	250.9	160.8	230.5	4
FW-17B	240.8	155.9	225.5	4
FW-18B	238.2	153.1	222.8	4
FW-19B	237.1	152.2	221.8	4
FW-20B	238.1	153.0	222.7	4
FW-21B	237.0	151.9	221.5	4
FW-22B	237.6	152.7	222.2	4
FW-22C**	386.1	321.0	369.0	4
FW-23B	232.4	147.4	217.0	4
FW-23C**	379.0	296.0	369.0	4
FW-24B	243.0	160.0	230.0	4
FW-24C	386.5	302.5	372.5	4
FW-25B	229.7	144.7	214.7	4
FW-25C	380.0	294.8	364.8	4
FW-26B	229.9	144.9	214.9	4
FW-26C	380.0	294.7	364.7	4
FW-27B	300.0	149.9	284.9	4
FW-28B	248.9	163.8	233.8	4
FW-29B	248.5	163.5	233.5	4
FW-29C	377.0	292.0	362.0	4
FW-30B	241.9	156.6	226.6	4
FW-31BE	242.0	146.7	236.7	4

* Well was completed in the borehole without well casing.
Top and bottom of screen depths refer to the end
of the 6" casing and the bottom of the borehole, respectively.
** Well was completed in the borehole without well casing.
top and bottom of screen depths refer to top and
bottom of the Westbay monitoring interval.



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