



## Field & Technical Services

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February 28, 2011

Illinois Environmental Protection Agency  
Division of Land Pollution Control #33, Permits Section  
(Groundwater Monitoring Unit)  
1021 North Grand Avenue, East  
Springfield, IL 62702

**RE: 2010 RCRA Annual Groundwater Monitoring Report  
Former Koppers Company Wood Treating Facility  
Carbondale, Illinois  
EPA I.D. # ILD 000 819 946**

Greetings:

On behalf of Beazer East, Inc. (Beazer), enclosed are three copies of the 2010 Annual RCRA Groundwater Monitoring Report for the above-referenced facility. If you have any questions, please call Mr. Michael Slenska of Beazer at (412) 208-8857 or me at (412) 429-2694.

Best Regards,

**Field & Technical Services, LLC**

Angie Gatchie  
Data Manager

Enclosure

cc: M. Slenska, Beazer (w/o enclosure)  
C. Bury, EPA Region V  
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Site Copy

# **2010 ANNUAL RCRA GROUNDWATER MONITORING REPORT**

**FORMER KOPPERS WOOD-TREATING SITE  
CARBONDALE, ILLINOIS**

**EPA ID No. ILD 000 819 946**

*Prepared for:*

**Beazer East, Inc.**

*Prepared by:*

**Field & Technical Services, LLC**

200 Third Avenue  
Carnegie, Pennsylvania 15106



**February 28, 2011**

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## ABBREVIATIONS/ACRONYMS

AOC	Areas of Concern
Beazer	Beazer East, Inc.
BTEX	Benzene, Toluene, Ethylbenzene, and total Xylenes
CAMU	Corrective Action Management Unit
CZC	Chromated Zinc Chloride
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
FCAP	Fluoro-Chrome-Arsenate Phenol
FTS	Field & Technical Services, LLC
GMP	Groundwater Monitoring Plan
IEPA	Illinois Environmental Protection Agency
IGMP	Interim Groundwater Monitoring Program
IWQC	Illinois Water Quality Criteria
NAPL	Non-Aqueous Phase Liquid
Non-Com	Non-Combustible fire retardant
O&M	Operations and Maintenance
ORP	Oxygen Reduction Potential
PAHs	Polynuclear Aromatic Hydrocarbons
RCRA Site	Resource Conservation and Recovery Act Former Koppers Wood-Treating Site, North Marion Street, immediately northeast of Carbondale in Jackson County, Illinois (ILD 000 819 946)
SOP	Standard Operation Procedure
S.U.	Standard Units
TACO	Tiered Approach to Corrective Action Objectives (IEPA)
USEPA	United States Environmental Protection Agency

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## 1.0 INTRODUCTION

Field & Technical Services, LLC (FTS), on behalf of Beazer East, Inc. (Beazer), prepared this 2010 Annual Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring Report for the Former Koppers Wood-Treating Site (Site) in Carbondale, Illinois. This report satisfies Beazer's obligations under the United States Environmental Protection Agency (USEPA) Administrative Order on Consent and the Illinois Environmental Protection Agency (IEPA) Consent Decree. The USEPA Identification Number for the Site is ILD 000 819 946, and the Illinois Site Inventory Number is 0778010002.

Beazer monitors Site groundwater on a semi-annual basis in accordance with the Interim Groundwater Monitoring Program (IGMP). The IGMP satisfies the requirements of the RCRA Interim Status closure and post-closure periods for the closed RCRA surface impoundments and was implemented in 1994 to evaluate Site-wide groundwater quality during the period between the completion of the remedial investigation and the initiation of remedial actions. The IEPA approved the original IGMP in January 1994, and the USEPA approved the revised IGMP in March 2001. Although remedial actions at the Site have been substantially completed, the IGMP will continue to be implemented until a long-term, post-remediation Groundwater Monitoring Plan (GMP) has been established. A proposed draft GMP was most recently submitted to the USEPA on October 6, 2008.

This report provides a summary and evaluation of the groundwater monitoring data collected in 2010 and is organized into six sections.

- **Section 1** includes this introduction and report organization.
- **Section 2** reviews the Site background information, geology, and hydrogeology.
- **Section 3** presents information on the current monitoring program and well network at the Site, as well as field procedures.
- **Section 4** discusses the presence of non-aqueous phase liquid (NAPL), groundwater flow patterns and migration assessments, and vertical gradients at the Site.
- **Section 5** presents groundwater quality results.
- **Section 6** presents the conclusions and future activities.

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## 2.0 SITE DESCRIPTION AND HISTORY

The Site is located on North Marion Street, immediately northeast of the city of Carbondale in Jackson County, Illinois. In approximately 1905, Ayer & Lord Tie Company began producing pressure-treated railroad crossties, utility poles, and other wood products at the Site. In 1940, Koppers Company purchased the facility. In 1944, Koppers Company was restructured and the Site became owned by Koppers Company, Inc. On December 29, 1988, Koppers Company, Inc. sold substantially all of its wood-treating business and assets, including the Carbondale Site and the “Koppers” name, to Koppers Industries, Inc., a new company established by a group of former Koppers Company, Inc. managers and at least one outside investor (now Koppers Inc.). On January 26, 1989, Koppers Company, Inc. changed its name to Beazer Materials and Services, Inc., and on April 16, 1990, that name was changed to Beazer East, Inc. (Beazer). In 2003, Koppers Industries, Inc. changed its name to Koppers Inc. Koppers Inc. ceased wood-treating operations at the Site in 1991 and conveyed the Site to Beazer on February 24, 1992. During the years of operation, a variety of chemicals were used at one time or another, including creosote, pentachlorophenol, fluoro-chrome-arsenate phenol (FCAP), chromated zinc chloride (CZC), and non-combustible fire retardant (Non-Com).

The USEPA and the IEPA identified the following eleven (11) areas of concern (AOCs) at the Site (as shown on Figure 1).

- Area 1 – the wood-treating cylinders
- Area 2 – the former sprayfield
- Area 3 – the drip track
- Area 4 – the former north drainage ditch
- Area 5 – the former wastepile area
- Area 6 – the former lagoon area
- Area 7 – the offsite spill area
- Area 8 – the service yard
- Area 9 – the storage tanks
- Area 10 – the closed RCRA surface impoundments
- Area 11 – the plant production area

Koppers Company discontinued use of the RCRA surface impoundment system (AOC 10) and sprayfield (AOC 2) in 1988, and excavated sludge and visibly impacted soil from within the impoundments for disposal in a permitted landfill. Beazer subsequently closed the surface impoundment system as a landfill (pursuant to the RCRA).

Beginning in 2004 and continuing through 2010, Beazer conducted various remediation activities as part of the RCRA corrective action program, including:

- Additional building/structure demolition in the former process area (completed);
- The relocation of part of Glade Creek (completed);
- The installation of a trench-based dense non-aqueous phase liquid (DNAPL) barrier near the former Glade Creek channel (completed);
- Construction of a containment cell within a Corrective Action Management Unit (CAMU) to consolidate/manage various materials generated during the remediation activities (completed);
- Excavation of waste piles, surficial “coal tar” materials and surficial soils from various areas at and south of the Site, including the Former North Drainage Ditch and surrounding area (completed);
- Installation of a surface cover over the former Process Area and the Former Lagoon Area (completed);
- Installation of a DNAPL recovery well at RW-23 (completed); and
- Excavation of visually impacted Glade Creek sediments (completed).

Operation and maintenance (O&M) of the completed and ongoing remedial components – including the DNAPL barrier, DNAPL recovery well, the wastewater treatment plant, and the CAMU containment cell – are being conducted. In addition to this O&M work, post-remediation groundwater monitoring is being conducted. A revised draft GMP was submitted to the USEPA on October 6, 2008, but has not yet been approved for implementation. In the interim, groundwater monitoring continues to be performed under the IGMP, with approved modifications to reflect current Site conditions and the status of the remediation activities.

## 2.1 SITE GEOLOGY

Site geology is characterized by unconsolidated, Pleistocene Age glacial sediments, which overlie Pennsylvanian Age bedrock. The glacial sediments are approximately 50 to 110 feet thick. The uppermost glacial sediments range from approximately 25 to 45 feet thick and average approximately 40 feet thick. In general, these glacial

deposits consist of silty clay with trace sand and occasional sand lenses (not more than several inches thick).

Below the uppermost glacial sediments are the shallow (upper) glacial sediment deposits consisting of gray or dark brown uniform (massive) silty clay. These sediments are noted for their lack of sand particles, fracture joints, or bedding, and are also characterized by an occasional isolated clayey silt layer or peat deposit. This massive clay unit appears to be continuous across the Site and varies in thickness from approximately 10 to 30 feet.

The lower glacial sediment is a gray, fine-to-medium sand with varying amounts of silt and occasional isolated silty clay lenses. This layer, situated just above bedrock, is encountered between 60 and 90 feet below ground surface and ranges from 15 to 40 feet thick.

Between the lower glacial sediment and the top of competent bedrock is a thin layer (up to several feet thick) of a very dense, variable color mixture of sand and gravel with significant amounts of clay and silt filling the coarse-grain voids. Particles of coal can be found within this layer, which is noticeably denser than the overlying materials.

The bedrock beneath the Site consists of Paleozoic Age sedimentary rock on the order of 10,000 feet thick. The bedrock surface beneath the Site is fairly flat with a slope of approximately 0.5 to 0.7 percent toward the northwest. The bedrock is predominantly light-to-dark shale with occasional thin layers of coal or limestone. The shale is thinly bedded, the coal and limestone layers are laminated, and all are moderately cemented.

## **2.2 SITE HYDROGEOLOGY**

Groundwater at the Site exists in both the unconsolidated glacial deposits and in bedrock. Due to the vertical thickness and lithologic characteristics of the sediments, four monitoring intervals were identified. The intervals were designated as the A/B-, C-, D-, and E-units. The A/B- through D-units are monitoring intervals within the unconsolidated materials, and the E-unit is the monitoring interval within the uppermost portion of bedrock. These units correspond to the various geologic units identified above, as summarized in the following table:

Geologic Description	Reference Nomenclature	Comments
Glacial Uppermost Sediments	A/B-unit	The A-unit refers to the upper portion of the glacial deposit, including the water table and the unsaturated unit. The B-unit refers to the lower portion of the glacial deposit. The A- and B-units are considered one hydrogeologic unit (the A/B-unit) based on their similar nature and degree of interaction.
Shallow (Upper) Glacial Sediments	C-unit	The C-unit includes the massive silty clay layer.
Lower Glacial Sediments	D-unit	The D-unit includes a dense sand layer in addition to a sand and gravel layer and a weathered shale/residual soil layer.
Bedrock	E-unit	The E-unit is defined as competent bedrock.

The A/B-unit was originally designated as two separate units. However, review of historical information for the Site shows that, for the purposes of assessing groundwater movement and quality, the A- and B-units can be grouped into one hydrostratigraphic unit. Both units have similar water-transmitting properties and they are not separated by confining layers. Both units contain thin, discontinuous lenses of sand, although these lenses are more common in the B-unit but are not believed to significantly affect groundwater flow through the A/B-unit.

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### 3.0 INTERIM GROUNDWATER MONITORING PROGRAM

FTS conducted the 2010 IGMP groundwater sampling events from February 14 through February 18, 2010 and August 1 through August 5, 2010.

The current IGMP includes sampling of 48 wells plus gauging at all existing monitoring wells (currently 69), nine piezometers, six temporary piezometers, five surface water gauges and two DNAPL barrier trench sumps. Figure 1 shows all monitoring locations (i.e., wells, piezometers, trench sumps, and surface water gauges). Table 1 identifies which monitoring locations were gauged and sampled during each 2010 semi-annual monitoring event. No changes to the IGMP occurred in 2010.

In February 2010, water levels were measured at 84 wells/piezometers and groundwater samples were collected from 48 wells (Table 1). Water-level measurements were also obtained at two DNAPL barrier trench sumps and four surface water gauges during the February 2010 event. Surface water gauge GC-2 could not be located during the February 2010 sampling event; it was submerged by floodwaters.

In August 2010, water levels were measured at 84 wells/piezometers and groundwater samples were collected from 48 wells (Table 1). Water-level measurements were also obtained at two DNAPL barrier trench sumps and three surface water gauges during the August 2010 event. Surface water gauge Pond-2 was dry and surface water gauge GC-2 could not be located during the August 2010 sampling event.

#### 3.1 WELL GAUGING

At the beginning of each sampling event, FTS field technicians used an oil/water interface probe to gauge each well/piezometer for depth-to-water, depth-to-NAPL, and total well depth. If NAPL was detected, the technician confirmed its presence via a new, clear disposable bailer and, if applicable, measured its thickness. Prior to use at each well, the technician cleaned the oil/water interface probe using an Alconox™ solution and deionized water rinse. The disposable bailers were disposed of after a single use. The 2010 well gauging data are summarized in Tables 2 through 4.

#### 3.2 WELL PURGING

Low-flow purging methods were used during both 2010 sampling events, in accordance with the updated Standard Operating Procedures (SOP) document titled “Low Flow (Minimal Drawdown) Groundwater Sampling Procedures,” submitted to the USEPA on October 22, 2007. During the low-flow purging, groundwater was

removed from each well using either a peristaltic pump, a stainless steel Monsoon submersible pump, or a stainless steel Hurricane pump and Teflon<sup>®</sup>-lined tubing. Field measurements of water quality parameters (pH, dissolved oxygen [DO], oxygen reduction potential [ORP], specific conductivity, temperature, and turbidity) were measured while purging each well, using a YSI 556 multi-parameter meter and a La Motte 2020e turbidity meter. Field measurements were taken every three to five minutes. The field technicians recorded field observations on the groundwater sampling forms. Purging continued until field measurements had stabilized (i.e., three consecutive readings were obtained within the following criteria):

- $\pm 0.1$  standard units (S.U.) for pH;
- $\pm 10\%$  for DO;
- $\pm 10$  mv for ORP;
- $\pm 3\%$  for specific conductivity;
- $\pm 0.1$  degrees Celsius for temperature; and,
- $\pm 10\%$  for turbidity.

The field technicians cleaned the submersible pumps using the following procedures. Each pump had its own set of dedicated buckets for cleaning.

- 1) Wash in Alconox<sup>™</sup> soap and deionized water
- 2) Rinse in deionized water
- 3) Rinse in acetone
- 4) Rinse in deionized water

### 3.3 GROUNDWATER SAMPLING

After the wells were purged, the technicians collected the groundwater samples. For wells that were purged dry, water levels were allowed to recover prior to sample collection. In accordance with the IGMP and low-flow sampling SOP, the FTS field crew collected groundwater samples using either a peristaltic pump, a stainless steel Monsoon submersible pump, or a stainless steel Hurricane pump and Teflon<sup>®</sup>-lined tubing. Samples collected for dissolved metals analysis were field-filtered using either a peristaltic pump, a stainless steel Monsoon submersible pump, or a stainless steel Hurricane pump equipped with a 0.45 micron filter and Teflon<sup>®</sup>-lined tubing. The samples were analyzed for the following constituents by TestAmerica (Pittsburgh, Pennsylvania):

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) (USEPA SW-846 Method 8021B).
- Polynuclear aromatic hydrocarbons (PAHs) and pentachlorophenol (USEPA SW-846 Method 8270C/SIM).
- Total recoverable phenolics (USEPA SW-846 Method 9066).
- Total and dissolved arsenic, chromium, and copper (USEPA SW-846 Method 6010B).

### 3.4 MONITORING WELL INSPECTION

During the February 2010 event, a comprehensive well inspection was conducted, which included 69 wells, nine piezometers, six temporary piezometers, five surface water gauges and two DNAPL barrier trench sumps. The technicians observed that the majority of the monitoring wells associated with the IGMP were in good condition, with only minor well repairs required. These minor well repairs were performed during or soon after the February 2010 event, and included relabeling wells and replacing missing or broken well caps. It was observed during the February 2010 well inspection that various monitoring wells had weathered or cracked pads. These monitoring wells were repaired on December 10, 2010. A comprehensive well inspection will also be completed in conjunction with the 2011 first semi-annual monitoring event, and identified deficiencies will be addressed and repairs completed as necessary.

In January 2010, FTS replaced the surface water gauges GC-1, GC-2, Pond-1, and Pond-2 to include concrete bin blocks. On February 2, 2010, Shawnee Survey & Consulting, Inc. surveyed the four locations. This data is presented in Tables 3 and 4.

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## 4.0 DNAPL DISTRIBUTION AND GROUNDWATER MIGRATION ASSESSMENT

### 4.1 NON-AQUEOUS PHASE LIQUIDS

As shown on Table 2, FTS observed DNAPL in P-8A, OB23-04B, OW-205B, R-008A, R-013E and the south DNAPL barrier trench sump during both the February and August 2010 monitoring events. Measured DNAPL thicknesses ranged from trace amount (R-008A, August event) to 10.72 feet (OB23-04B, February event).

In 2010, DNAPL levels in R-013E were gauged on a monthly basis; DNAPL thicknesses ranged from 0.12 to 1.21 feet. No DNAPL was removed from R-013E in 2010. The volume of DNAPL removed from R-013E has been decreasing over time; DNAPL has not been removed from this well since May 2007.

Measurements of DNAPL thickness were also collected in wells P-8A, OW-205B, and R-008A throughout 2010. In well P-8A, DNAPL thicknesses ranged from 0.19 to 0.91 feet; no DNAPL was removed from P-8A in 2010. At well OW-205B, DNAPL thicknesses ranged from 0.12 to 1.28 feet in 2010. DNAPL was removed from well OW-205B on one occasion in 2010, resulting in a total recovered DNAPL volume of 0.23 gallons in 2010. In well R-008A, DNAPL thicknesses ranged from trace to 0.65 feet; no DNAPL was removed from R-008A in 2010.

In late 2004, Beazer initiated DNAPL recovery from the south sump of the trench-based DNAPL barrier located near Glade Creek. In 2010, approximately 1,913 gallons of DNAPL were recovered from the south sump. The only other collection sump installed in the trench, referred to as the north sump, and has never contained DNAPL.

In late October 2005, Beazer initiated DNAPL recovery activities at recovery well RW-23, which is located in the former process area of the Site. Water is pumped from this well to increase the hydraulic gradient and draw DNAPL into the recovery well. DNAPL is pumped as it accumulates in the well. In 2010, approximately 581 gallons of DNAPL were recovered from RW-23.

### 4.2 GROUNDWATER FLOW PATTERNS

FTS used the depth-to-groundwater measurements from the A/B-, C-, D-, and E-unit monitoring wells, piezometers, and surface water gauges to calculate potentiometric surface elevations (Tables 3 and 4). These data were subsequently used to construct potentiometric surface maps and infer horizontal directions of groundwater flow in

each of the monitored units. Figures 2 through 9 provide the potentiometric surface maps for each unit during each semi-annual event. The potentiometric contours and associated flow patterns for both monitoring events are discussed below for each of the four hydrogeologic units.

#### 4.2.1 A/B-UNIT

Figures 2 and 3 show the A/B-unit potentiometric contours for the 2010 February and August sampling events, respectively. Because localized vertical gradients exist within the A/B-unit, some well data may appear to conflict with the drawn A/B-unit contours or data from adjacent wells. Professional judgment was used to draw the contours in these locations. As shown on Figures 2 and 3, groundwater was mounded near the south central portion of the Site in both February and August. Groundwater in this portion of the Site generally moves outward from the center of the mound. The lateral extent of the drawdown cone developed by pumping at recovery well RW-23 (Figures 2 and 3) is expected to be small, given the low permeability of the A/B unit.

In the eastern portion of the Site, groundwater generally moves toward Glade Creek, which represents a discharge boundary in the unit. Groundwater flow patterns were consistent with previous observations, except that the anomalously high groundwater elevation at well OW-204A that was first noted in February 2009 occurred again in February 2010. While the measured groundwater elevation for this well in February 2010 is not used in the contouring shown on Figure 2, the February 2011 data for this well will be evaluated and if the trend persists, a recommendation will be made regarding the need for additional information at this well and/or whether to include it in future potentiometric surface mapping. Also in the eastern portion of the site, the surface-water elevations for the two staff gauges that were installed (January 2010) to replace the existing gauges in the pond (i.e., Pond-1 and Pond-2) were anomalously low for both the February and August events. Those two events represent the first time readings were collected at these new gauges. The survey data and field notes were reviewed, and no clear explanation was identified. This matter will be further investigated and resolved in 2011.

Historical groundwater and surface water elevation data indicate that Smith Ditch (a seasonal water body that flows to the north) changes between being a discharge and recharge feature for A/B-unit groundwater. In 2010, Smith Ditch appears to have been a gaining feature during the February event. During the August event, the measured water elevation at the Smith Ditch gauge was anomalously high and was not used to construct Figure 3.

#### 4.2.2 C-UNIT

Figures 4 and 5 show the C-unit potentiometric surfaces for the February and August 2010 sampling events, respectively. Because the C-unit acts as a confining unit between the A/B- and D-units, the direction of groundwater movement in the unit is predominantly vertical (downward); therefore, inferring groundwater flow directions from Figures 4 and 5 are not appropriate. The distributions of potentiometric head observed in the unit in 2010 are consistent with previous observations.

#### 4.2.3 D-UNIT

Figures 6 and 7 show the D-unit potentiometric surface for the February and August 2010 sampling events, respectively. Throughout the Site, flow was generally to the north-northeast in both the February and August 2010 events. These groundwater elevations and flow patterns are consistent with previous observations.

#### 4.2.4 E-UNIT

Figures 8 and 9 show the E-unit groundwater elevation contours for the February and August 2010 sampling events, respectively. During the February 2010 event, flow throughout the Site was generally to the east. Groundwater elevations observed in February 2010 were higher to those observed in February 2009.

During the August 2010 event, flow in the eastern portion of the Site was generally to the east-southeast. Flow in the western portion of the Site was to the northwest. August 2010 groundwater elevations were similar to those observed in August 2009 in the E-unit. Historical data shows that there can be significant variations in the flow patterns for the E-unit.

### 4.3 GROUNDWATER MIGRATION ASSESSMENT

FTS calculated the average horizontal groundwater linear flow velocities (Table 5) for each sampling event using the Darcy flow equation:

$$V_L = \frac{K * i}{n_e}$$

where:

$V_L$  = average linear groundwater flow velocity

$K$  = hydraulic conductivity

$i$  = average horizontal hydraulic gradient

$n_e$  = effective porosity

Horizontal gradients and linear groundwater velocities calculated using the 2010 groundwater elevation data for selected well pairs are summarized in Table 5. For February and August 2010, all of the average horizontal gradients (A/B-, C-, D-, and E-units) fall within the typical historical range as shown on Table 5.

It should be noted that constituent velocities will be less than the groundwater linear velocities presented in Table 5 because factors such as adsorption, dispersion, and biologic activity will retard the movement of dissolved constituents. Therefore, the groundwater linear velocity represents a conservatively high velocity when compared to constituent velocity.

#### 4.4 VERTICAL HYDRAULIC GRADIENT

Vertical hydraulic gradients calculated using the 2010 groundwater elevation data for selected well pairs are presented in Table 6. A positive number indicates a downward gradient whereas a negative number indicates an upward gradient. An upward vertical gradient suggests that the vertical component of the groundwater flow will be from the lower to upper monitored interval. This potentially limits downward vertical migration of constituents. Figure 10 shows the calculated vertical gradient directions between the A-, B-, and C-units and between the D- and E-units. The overall results are similar to historical vertical gradients.

In the A/B-unit, groundwater flows downward and outward from the central portion of the Site (beneath the A/B-unit groundwater mound located near the former process area [Figures 2 and 3]), predominantly toward Glade Creek. Near Glade Creek, groundwater generally moves upward, discharging to the Creek as shown in the OW-044A/B well pair. In 2006 and 2008, Beazer installed additional wells closer to the new alignment of Glade Creek to monitor groundwater flow and constituent migration in this area.

The C-unit is an aquitard that is interpreted to separate the local groundwater flow system of the A/B-unit from a more regional flow system that includes the D- and E-units.

Groundwater flow in the D- and E-units is interpreted to be predominantly lateral beneath the Site. Vertical gradients between the D- and E-units vary spatially and seasonally and are likely controlled by spatial variability in hydraulic conductivity within the E-unit, and the degree of hydraulic communication between the D- and E-units.

## 5.0 GROUNDWATER QUALITY

TestAmerica analyzed the groundwater samples and FTS reviewed the resulting data for quality and completeness. Upon acceptance, FTS electronically transferred the data into a database for storage, reduction, and evaluation. Table 7 summarizes wells in which target analytes were detected during the 2010 groundwater monitoring events. Appendix A (Tables A-3 and A-4) summarizes the 2010 analytical results and compares them to applicable IEPA Tiered Approach to Corrective Action Objectives (TACO) Tier I groundwater standards. In doing so, data from D- and E-Unit wells are compared to Class I standards and data from A/B- and C-Unit wells are compared to Class II standards. Table 8 summarizes data that exceeded applicable TACO groundwater standards for the first and second semi-annual 2010 groundwater sampling events. Table 9 summarizes data collected from wells OW-041A, OW-41B, OW-205A, OW-206A, and OW-207A (located near Glade Creek) compared to the Illinois Water Quality Criteria (IWQC). Please note that the IWQC are not applicable to groundwater but comparison is being done as requested by USEPA.

### 5.1 FIELD MEASUREMENTS

The final field measurements collected during sampling are summarized in Appendix A (Tables A-1 and A-2). Field-measured specific conductivity, temperature, and pH data for 2010 are similar to those measured historically.

### 5.2 POLYNUCLEAR AROMATIC HYDROCARBONS

In accordance with the IGMP, TestAmerica analyzed the groundwater samples for 16 PAHs using USEPA SW-846 Method 8270C/SIM. The suite of PAHs consists of:

acenaphthene	benzo(g,h,i)perylene	fluorene
acenaphthylene	benzo(k)fluoranthene	indeno(1,2,3-cd)pyrene
anthracene	chrysene	naphthalene
benzo(a)anthracene	dibenzo(a,h)anthracene	phenanthrene
benzo(a)pyrene	fluoranthene	pyrene
benzo(b)fluoranthene		

Table 7 lists the wells with PAH detections and the range of total PAH detections for 2010. These results are similar to previous data in that low-level PAH detections appear sporadically in most wells.

As indicated in Table 8, one or more PAH concentrations in groundwater samples from wells OW-102E, OW-201E Dup, OW-205A, and R-014C exceeded TACO groundwater standards in the first semi-annual 2010 event. Also, one or more PAH concentrations in groundwater samples from wells OW-033E and OW-205A



exceeded TACO groundwater standards in the second semi-annual 2010 event. Well OW-205A was the only well to have exceedences in both sampling events. PAH results for all other wells/events were below the applicable TACO groundwater standards.

Note that the PAHs that exceeded TACO standards in the February 2010 duplicate sample from well OW-201E were not detected in the primary sample from this well. The concentrations detected in the duplicate sample OW-201E are not representative of historical Site conditions. Based on this and the fact that in August 2010 PAHs were not detected in the sample from this well, the February 2010 PAH data from OW-201E Dup is not likely representative of actual groundwater quality at this well.

The PAH data for the February 2010 samples collected from well R-014C are not consistent with historical results for this well and are suspect. Sample data collected from R-014C in August 2010 were consistent with historical results indicating that the February 2010 PAH results are anomalous.

Low-level PAH exceedences observed in the February 2010 sample collected from well OW-102E and the August 2010 sample collected from well OW-033E are consistent with historical data for these wells. PAHs have historically fluctuated in these wells from non-detect to detections near standards. Please note that both wells only had exceedences observed from one of the sampling events conducted in 2010 and that these same PAHs which exceeded standards were non-detect in the August 2010 data from well OW-102E and the February 2010 event from well OW-033E.

The exceedance of the TACO standard for naphthalene in the samples collected from OW-205A is consistent with historical data for this well.

### **5.3 PENTACHLOROPHENOL**

Each groundwater sample was analyzed for pentachlorophenol using USEPA SW-846 Method 8270C. Table 7 shows there were no detections of pentachlorophenol in either sampling event for 2010. The pentachlorophenol results for 2010 are consistent with historical data.

### **5.4 VOLATILE ORGANIC COMPOUNDS**

Groundwater samples were analyzed for BTEX using USEPA SW-846 Method 8021B. There were detections of BTEX in wells OW-205A in both events as shown in Table 7; however, there were no exceedences of the applicable TACO groundwater standards, as shown in Table 8. The VOC results for 2010 are consistent with historical data.



## **5.5 METALS**

Each IGMP groundwater sample was analyzed for total (unfiltered) and dissolved (filtered) arsenic, chromium, and copper by USEPA SW-846 Method 6010B. As presented in Table 8, dissolved arsenic in well OW-026A was the only metal that exceeded an applicable TACO standard for both either sampling event. All other detections were below the applicable TACO groundwater standards. The metals results for 2010 are consistent with historical data.

## **5.6 TOTAL RECOVERABLE PHENOLICS**

Groundwater samples were analyzed for total recoverable phenolics using USEPA SW-846 Method 9066. Table 7 lists the wells with detections and the range of results. Total recoverable phenolics were detected in samples from both 2010 events. The total recoverable phenolics results for the 2010 sampling events are similar to those reported historically, in that low-level total recoverable phenolics detections occur sporadically. Note that total recoverable phenolics were detected in field blanks collected during both 2010 events; associated samples have been qualified with a “B” indicating field blank contamination. There are no TACO Tier I groundwater standards for total recoverable phenolics.

## **5.7 DATA QUALITY**

Field and laboratory data quality control measures were implemented as required by the IGMP. All of the necessary data qualifiers were added to the Site database and are present in the data summary tables provided in Appendix A (Tables A-3 and A-4). Data Evaluation Reports are included in Appendix B. While some qualifiers were added to the data, none of the data were rejected based on evaluation of the quality control data.

## **6.0 CONCLUSIONS AND CHANGES TO THE INTERIM GROUNDWATER MONITORING PROGRAM**

Beazer has evaluated the 2010 IGMP data and reached the following conclusions:

- The 2010 groundwater flow directions and velocities for each monitored interval were similar to those reported historically.
- DNAPL was present in six of the 86 Site monitoring points (OB23-04B, OW-205B, P-8A, R-008A, R-013E, and the South Sump). The 86 locations are comprised of 84 wells/piezometers and two trench sumps (north sump and south sump).
- The 2010 groundwater quality data are generally consistent with historical results.

Beazer submitted a draft long-term, post-remediation GMP to the USEPA on November 16, 2007. Beazer and the USEPA discussed the draft GMP during a July 2008 meeting, and a revised draft GMP was submitted to the USEPA on October 6, 2008. The GMP proposes several modifications to the current IGMP, and will be implemented following approval by the USEPA. In the interim, groundwater monitoring will continue to be performed under the IGMP.

## **TABLES**

**Table 1**  
**Summary of IGMP Program**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Well Identification	2010 First Semi-Annual Event		2010 Second Semi-Annual Event	
	Gauged	Sampled	Gauged	Sampled
<b>DNAPL Barrier Trench Sumps</b>				
North Sump	X	---	X	---
South Sump	X	---	X	---
<b>Surface Water Gauges</b>				
GC-1	X	---	X	---
GC-2	NM	---	NM	---
Pond-1	X	---	X	---
Pond-2	X	---	DRY	---
Smith-1	X	---	X	---
<b>A-Unit</b>				
OW-003A	X	---	X	---
OW-017A	X	X	X	X
OW-026A	X	X	X	X
OW-027A	X	X	X	X
OW-031A	X	X	X	X
OW-041A	X	X	X	X
OW-044A	X	---	X	---
OW-202A	X	X	X	X
OW-203A	X	X	X	X
OW-204A	X	X	X	X
OW-205A	X	X	X	X
OW-206A	X	X	X	X
OW-207A	X	X	X	X
P-2	X	---	X	---
P-3	X	---	X	---
P-4A	X	---	X	---
P-6A	X	---	X	---
P-7A	X	---	X	---
P-8A	X	---	X	---
R-008A	X	---	X	---
R-013A	X	X	X	X
TP-5A	X	---	X	---
TP-11A	X	---	X	---
TP-12A	X	---	X	---
TP-13A	X	---	X	---
TP-14A	X	---	X	---
TP-15A	X	---	X	---
<b>B-Unit</b>				
OB23-04B	X	---	X	---
OW-010B	X	X	X	X
OW-022BR	X	X	X	X
OW-035B	X	X	X	X
OW-036B	X	X	X	X
OW-037B	X	X	X	X
OW-039BR2	X	X	X	X
OW-040B	X	X	X	X
OW-041B	X	X	X	X
OW-042B	X	X	X	X
OW-043B	X	---	X	---
OW-044B	X	---	X	---
OW-102B	X	X	X	X
OW-202B	X	X	X	X
OW-204B	X	X	X	X
OW-205B	X	---	X	---
P-5B	X	---	X	---
P-6B	X	---	X	---
P-7B	X	---	X	---
S-003B	X	---	X	---

**Table 1 (Continued)**  
**Summary of IGMP Program**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Well Identification	2010 First Semi-Annual Event		2010 Second Semi-Annual Event	
	Gauged	Sampled	Gauged	Sampled
<b>C-Unit</b>				
OW-017C	X	X	X	X
OW-023C	X	X	X	X
OW-027C	X	---	X	---
OW-035C	X	X	X	X
OW-036C	X	---	X	---
R-013C	X	---	X	---
R-014C	X	X	X	X
<b>D-Unit</b>				
A-008D	X	---	X	---
OW-010D	X	---	X	---
OW-012D	X	X	X	X
OW-017D	X	---	X	---
OW-023D	X	X	X	X
OW-027D	X	X	X	X
OW-035DR	X	X	X	X
OW-036D	X	---	X	---
OW-037D	X	X	X	X
OW-039DR	X	X	X	X
OW-040D	X	X	X	X
OW-041D	X	X	X	X
OW-042DR	X	---	X	---
OW-044D	X	X	X	X
OW-102D	X	X	X	X
OW-202D	X	X	X	X
R-013D	X	---	X	---
R-014D	X	X	X	X
<b>E-Unit</b>				
A-008E	X	---	X	---
OW-003E	X	---	X	---
OW-012E	X	---	X	---
OW-027E	X	X	X	X
OW-033E	X	X	X	X
OW-035E	X	X	X	X
OW-039ER	X	X	X	X
OW-102E	X	X	X	X
OW-200E	X	X	X	X
OW-201E	X	X	X	X
R-013E	X	---	X	---
R-014E	X	X	X	X
<b>Totals</b>	<b>90</b>	<b>48</b>	<b>89</b>	<b>48</b>

**Notes:**  
 "X" indicates field applies to that well  
 "---" indicates field does not apply to that well  
 "NM" indicates well was not gauged

**Table 2**  
**Summary of 2010 DNAPL Thickness Measurements**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Well Identification	First Semi-Annual (February 15, 2010)			Second Semi-Annual (August 1, 2010)		
	Depth to DNAPL (Feet TOC)	Total Well Depth (Feet TOC)	DNAPL Thickness (Feet)	Depth to DNAPL (Feet TOC)	Total Well Depth (Feet TOC)	DNAPL Thickness (Feet)
P-8A	17.10	18.01	0.91	17.88	18.30	0.42
R-008A	16.34	16.67	0.33	16.67	16.67	Trace
OB23-04B	41.23	51.95	10.72	46.05	52.00	5.95
OW-205B	30.36	31.20	0.84	30.01	31.20	1.19
R-013E	134.78	135.99	1.21	134.54	135.08	0.54
South Sump	50.85	51.30	0.45	48.01	51.30	3.29

**Notes:**

feet TOC - feet below top of casing

**Table 3**  
**Summary of Groundwater Elevations**  
**February 14 and 15, 2010**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Well	Gauging Date	Measuring Point Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater/ Surface Water (Feet TOC)	Groundwater/ Surface Water Elevation (Feet msl)
<b>DNAPL Barrier Trench Sumps</b>						
North Sump	15-Feb-10	378.67	NA	NA	7.49	371.18
South Sump	15-Feb-10	377.01	NA	NA	6.28	370.73
<b>Surface Water Gauges</b>						
Pond-1*	15-Feb-10	369.72	NA	NA	4.95	364.77
Pond-2*	15-Feb-10	363.06	NA	NA	0.81	362.25
GC-1*	14-Feb-10	369.02	NA	NA	1.48	367.54
GC-2*	14-Feb-10	369.88	NA	NA	NM	NM
Smith-1	15-Feb-10	388.90	NA	NA	4.19	384.71
<b>A-Unit</b>						
OW-003A	14-Feb-10	380.36	372.58	362.58	2.16	378.20
OW-017A	14-Feb-10	393.93	385.80	375.80	5.28	388.65
OW-026A	14-Feb-10	399.56	382.00	372.00	7.33	392.23
OW-027A	14-Feb-10	391.69	383.00	373.00	4.31	387.38
OW-031A	14-Feb-10	399.00	388.80	378.80	4.50	394.50
OW-041A	14-Feb-10	375.52	368.02	358.02	4.95	370.57
OW-044A	14-Feb-10	378.35	362.10	352.10	6.25	372.10
OW-202A	14-Feb-10	394.73	390.25	380.25	3.23	391.50
OW-203A	14-Feb-10	376.89	369.39	359.39	8.60	368.29
OW-204A	14-Feb-10	380.64	373.14	363.14	6.70	373.94
OW-205A	14-Feb-10	372.80	360.30	350.30	3.29	369.51
OW-206A	14-Feb-10	368.62	362.27	352.27	2.29	366.33
OW-207A	14-Feb-10	371.91	364.74	354.74	3.12	368.79
P-2	14-Feb-10	376.38	NA	NA	5.31	371.07
P-3	14-Feb-10	372.69	NA	NA	5.79	366.90
P-4A	14-Feb-10	376.64	369.14	359.14	6.69	369.95
P-6A	14-Feb-10	376.58	369.09	359.08	7.15	369.43
P-7A	15-Feb-10	377.84	370.34	360.34	4.99	372.85
P-8A	15-Feb-10	377.49	370.00	360.00	5.63	371.86
TP-5A	14-Feb-10	381.81	372.01	362.01	11.92	369.89
TP-11A	14-Feb-10	375.58	365.68	355.68	3.25	372.33
TP-12A	15-Feb-10	374.04	369.04	359.04	4.58	369.46
TP-13A	15-Feb-10	375.85	370.95	360.95	3.62	372.23
TP-14A	15-Feb-10	372.25	367.25	357.25	3.16	369.09
TP-15A	15-Feb-10	372.82	367.72	357.72	3.51	369.31
R-008A	15-Feb-10	387.89	381.10	371.10	2.33	385.56
R-013A	14-Feb-10	387.68	379.92	369.92	2.58	385.10

**Table 3 (Continued)**  
**Summary of Groundwater Elevations**  
**February 14 and 15, 2010**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Well	Gauging Date	Measuring Point Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater/ Surface Water (Feet TOC)	Groundwater/ Surface Water Elevation (Feet msl)
<b>B-Unit</b>						
OB23-04B	15-Feb-10	401.34	361.41	351.41	13.42	387.92
OW-010B	14-Feb-10	381.47	344.00	334.00	4.10	377.37
OW-022BR	14-Feb-10	395.97	361.24	351.24	2.23	393.74
OW-035B	14-Feb-10	399.35	371.50	361.50	4.78	394.57
OW-036B	14-Feb-10	396.78	360.90	350.90	8.92	387.86
OW-037B	14-Feb-10	394.74	361.20	351.20	2.61	392.13
OW-039BR2	14-Feb-10	382.69	365.19	355.19	13.28	369.41
OW-040B	14-Feb-10	377.91	342.20	332.20	9.75	368.16
OW-041B	14-Feb-10	375.16	333.90	323.90	4.70	370.46
OW-042B	14-Feb-10	388.68	357.65	347.65	2.41	386.27
OW-043B	14-Feb-10	394.38	363.90	353.90	5.05	389.33
OW-044B	14-Feb-10	378.78	342.10	332.10	5.65	373.13
OW-102B	14-Feb-10	397.19	364.00	354.00	3.22	393.97
OW-202B	14-Feb-10	395.26	365.37	355.37	5.99	389.27
OW-204B	14-Feb-10	381.04	363.54	353.54	11.00	370.04
OW-205B	15-Feb-10	373.37	350.87	340.87	4.33	369.04
P-5B	14-Feb-10	382.05	361.55	351.55	11.69	370.36
P-6B	14-Feb-10	376.51	359.01	349.01	6.76	369.75
P-7B	15-Feb-10	377.63	360.13	350.13	5.49	372.14
S-003B	14-Feb-10	392.19	362.30	352.30	2.08	390.11
<b>C-Unit</b>						
OW-017C	14-Feb-10	393.31	322.91	312.91	15.91	377.40
OW-023C	14-Feb-10	401.43	313.97	303.97	23.95	377.48
OW-027C	14-Feb-10	391.14	320.53	310.53	13.29	377.85
OW-035C	14-Feb-10	400.02	313.30	303.30	22.65	377.37
OW-036C	14-Feb-10	396.93	311.27	301.27	21.62	375.31
R-013C	14-Feb-10	388.58	321.23	311.23	11.41	377.17
R-014C	14-Feb-10	393.35	321.30	311.30	15.47	377.88
<b>D-Unit</b>						
A-008D	14-Feb-10	388.71	279.30	269.30	11.60	377.11
OW-010D	14-Feb-10	382.19	296.58	286.58	6.78	375.41
OW-012D	14-Feb-10	395.82	286.70	276.70	19.20	376.62
OW-017D	14-Feb-10	394.08	291.05	281.05	17.52	376.56
OW-023D	14-Feb-10	401.42	287.81	272.81	24.21	377.21
OW-027D	14-Feb-10	391.40	278.53	268.53	14.37	377.03
OW-035DR	14-Feb-10	399.32	280.84	270.84	22.04	377.28
OW-036D	14-Feb-10	397.28	287.71	277.71	21.45	375.83
OW-037D	14-Feb-10	395.07	281.57	271.57	17.79	377.28
OW-039DR	14-Feb-10	381.85	284.35	274.35	6.83	375.02
OW-040D	14-Feb-10	377.68	291.40	281.40	2.63	375.05
OW-041D	14-Feb-10	376.68	294.10	284.10	1.36	375.32
OW-042DR	14-Feb-10	390.45	280.30	270.30	14.26	376.19
OW-044D	14-Feb-10	379.01	283.80	273.80	4.49	374.52
OW-102D	14-Feb-10	396.85	288.80	278.80	19.44	377.41
OW-202D	14-Feb-10	395.10	303.32	293.32	17.02	378.08
R-013D	14-Feb-10	387.03	280.91	270.91	10.13	376.90
R-014D	14-Feb-10	393.44	276.90	266.90	16.42	377.02

**Table 3 (Continued)**  
**Summary of Groundwater Elevations**  
**February 14 and 15, 2010**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Well	Gauging Date	Measuring Point Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater/ Surface Water (Feet TOC)	Groundwater/ Surface Water Elevation (Feet msl)
<b>E-Unit</b>						
A-008E	14-Feb-10	388.61	255.90	245.90	12.01	376.60
OW-003E	14-Feb-10	378.10	270.16	260.16	2.39	375.71
OW-012E	14-Feb-10	395.76	262.71	252.71	19.00	376.76
OW-027E	14-Feb-10	390.98	263.46	253.46	13.99	376.99
OW-033E	14-Feb-10	398.77	265.50	255.50	21.89	376.88
OW-035E	14-Feb-10	399.19	265.81	255.81	22.17	377.02
OW-039ER	14-Feb-10	382.04	261.54	251.54	6.74	375.30
OW-102E	14-Feb-10	396.91	264.80	254.80	20.09	376.82
OW-200E	14-Feb-10	387.47	262.89	252.89	10.86	376.61
OW-201E	14-Feb-10	389.69	264.30	254.30	12.62	377.07
R-013E	15-Feb-10	387.22	262.24	252.24	10.31	376.91
R-014E	14-Feb-10	392.87	259.46	249.46	16.31	376.56

**Notes:**

Feet msl - feet above mean sea level

Feet TOC - feet below top of casing

NA - not applicable or not available

NM - not measured or could not be located

\* Measuring Point Elevations were surveyed on February 2, 2010 by Shawnee Survey & Consulting, Inc.

**Table 4**  
**Summary of Groundwater Elevations**  
**August 1, 2010**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Well	Gauging Date	Measuring Point Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater / Surface Water (Feet TOC)	Groundwater/ Surface Water Elevation (Feet msl)
<b>DNAPL Barrier Trench Sumps</b>						
North Sump	01-Aug-10	378.67	NA	NA	9.43	369.24
South Sump	01-Aug-10	377.01	NA	NA	8.20	368.81
<b>Surface Water Gauges</b>						
Pond-1*	01-Aug-10	369.72	NA	NA	6.00	363.72
Pond-2*	01-Aug-10	363.06	NA	NA	Dry	NM
GC-1*	01-Aug-10	369.02	NA	NA	1.64	367.38
GC-2*	01-Aug-10	369.88	NA	NA	NM	NM
Smith-1	01-Aug-10	388.90	NA	NA	0.87	388.03
<b>A-Unit</b>						
OW-003A	01-Aug-10	380.36	372.58	362.58	5.01	375.35
OW-017A	01-Aug-10	393.93	385.80	375.80	12.11	381.82
OW-026A	01-Aug-10	399.56	382.00	372.00	9.02	390.54
OW-027A	01-Aug-10	391.69	383.00	373.00	9.45	382.24
OW-031A	01-Aug-10	399.00	388.80	378.80	8.16	390.84
OW-041A	01-Aug-10	375.52	368.02	358.02	7.61	367.91
OW-044A	01-Aug-10	379.20	362.10	352.10	8.70	370.50
OW-202A	01-Aug-10	394.73	390.25	380.25	8.94	385.79
OW-203A	01-Aug-10	376.89	369.39	359.39	8.88	368.01
OW-204A	01-Aug-10	380.64	373.14	363.14	12.07	368.57
OW-205A	01-Aug-10	372.80	360.30	350.30	5.65	367.15
OW-206A	01-Aug-10	368.62	362.27	352.27	5.02	363.60
OW-207A	01-Aug-10	371.91	364.74	354.74	6.15	365.76
P-2	01-Aug-10	376.38	NA	NA	8.31	368.07
P-3	01-Aug-10	372.69	NA	NA	8.38	364.31
P-4A	01-Aug-10	376.64	369.14	359.14	5.49	371.15
P-6A	01-Aug-10	376.58	369.09	359.08	8.54	368.04
P-7A	01-Aug-10	377.84	370.34	360.34	7.85	369.99
P-8A	01-Aug-10	377.49	370.00	360.00	5.92	371.57
TP-5A	01-Aug-10	381.81	372.01	362.01	12.39	369.42
TP-11A	01-Aug-10	375.58	365.68	355.68	7.09	368.49
TP-12A	01-Aug-10	374.04	369.04	359.04	6.55	367.49
TP-13A	01-Aug-10	375.85	370.95	360.95	8.38	367.47
TP-14A	01-Aug-10	372.25	367.25	357.25	7.74	364.51
TP-15A	01-Aug-10	372.82	367.72	357.72	6.43	366.39
R-008A	01-Aug-10	387.89	381.10	371.10	6.68	381.21
R-013A	01-Aug-10	387.68	379.92	369.92	5.73	381.95
<b>B-Unit</b>						
OB23-04B	01-Aug-10	401.34	361.41	351.41	15.22	386.12
OW-010B	01-Aug-10	381.47	344.00	334.00	10.55	370.92
OW-022BR	01-Aug-10	395.97	361.24	351.24	8.85	387.12
OW-035B	01-Aug-10	399.35	371.50	361.50	11.65	387.70
OW-036B	01-Aug-10	396.78	360.90	350.90	14.33	382.45
OW-037B	01-Aug-10	394.74	361.20	351.20	5.55	389.19
OW-039BR2	01-Aug-10	382.69	365.19	355.19	15.21	367.48
OW-040B	01-Aug-10	377.91	342.20	332.20	10.61	367.30
OW-041B	01-Aug-10	375.16	333.90	323.90	6.23	368.93
OW-042B	01-Aug-10	388.68	357.65	347.65	4.26	384.42
OW-043B	01-Aug-10	394.38	363.90	353.90	9.88	384.50
OW-044B	01-Aug-10	378.78	342.10	332.10	7.41	371.37
OW-102B	01-Aug-10	397.19	364.00	354.00	9.61	387.58
OW-202B	01-Aug-10	395.26	365.37	355.37	10.87	384.39
OW-204B	01-Aug-10	381.04	363.54	353.54	12.28	368.76
OW-205B	01-Aug-10	373.37	350.87	340.87	7.91	365.46
P-5B	01-Aug-10	382.05	361.55	351.55	13.77	368.28
P-6B	01-Aug-10	376.51	359.01	349.01	8.15	368.36
P-7B	01-Aug-10	377.63	360.13	350.13	5.22	372.41
S-003B	01-Aug-10	392.19	362.30	352.30	7.22	384.97

**Table 4 (Continued)**  
**Summary of Groundwater Elevations**  
**August 1, 2010**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Well	Gauging Date	Measuring Point Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater / Surface Water (Feet TOC)	Groundwater/ Surface Water Elevation (Feet msl)
<b>C-Unit</b>						
OW-017C	01-Aug-10	393.31	322.91	312.91	16.55	376.76
OW-023C	01-Aug-10	401.43	313.97	303.97	24.73	376.70
OW-027C	01-Aug-10	391.14	320.53	310.53	14.19	376.95
OW-035C	01-Aug-10	400.02	313.30	303.30	23.51	376.51
OW-036C	01-Aug-10	396.93	311.27	301.27	21.58	375.35
R-013C	01-Aug-10	388.58	321.23	311.23	12.29	376.29
R-014C	01-Aug-10	393.35	321.30	311.30	16.06	377.29
<b>D-Unit</b>						
A-008D	01-Aug-10	388.71	279.30	269.30	12.52	376.19
OW-010D	01-Aug-10	382.19	296.58	286.58	7.99	374.20
OW-012D	01-Aug-10	395.82	286.70	276.70	20.18	375.64
OW-017D	01-Aug-10	394.08	291.05	281.05	17.86	376.22
OW-023D	01-Aug-10	401.42	287.81	272.81	25.04	376.38
OW-027D	01-Aug-10	391.40	278.53	268.53	15.21	376.19
OW-035DR	01-Aug-10	399.32	280.84	270.84	23.12	376.20
OW-036D	01-Aug-10	397.28	287.71	277.71	22.64	374.64
OW-037D	01-Aug-10	395.07	281.57	271.57	18.61	376.46
OW-039DR	01-Aug-10	381.85	284.35	274.35	8.31	373.54
OW-040D	01-Aug-10	377.68	291.40	281.40	3.89	373.79
OW-041D	01-Aug-10	376.68	294.10	284.10	2.59	374.09
OW-042DR	01-Aug-10	390.45	280.30	270.30	14.30	376.15
OW-044D	01-Aug-10	379.89	283.80	273.80	5.96	373.93
OW-102D	01-Aug-10	396.85	288.80	278.80	20.32	376.53
OW-202D	01-Aug-10	395.10	303.32	293.32	17.72	377.38
R-013D	01-Aug-10	387.03	280.91	270.91	10.94	376.09
R-014D	01-Aug-10	393.44	276.90	266.90	17.27	376.17
<b>E-Unit</b>						
A-008E	01-Aug-10	388.61	255.90	245.90	12.82	375.79
OW-003E	01-Aug-10	378.10	270.16	260.16	3.60	374.50
OW-012E	01-Aug-10	395.76	262.71	252.71	19.56	376.20
OW-027E	01-Aug-10	390.98	263.46	253.46	14.80	376.18
OW-033E	01-Aug-10	398.77	265.50	255.50	22.65	376.12
OW-035E	01-Aug-10	399.19	265.81	255.81	22.98	376.21
OW-039ER	01-Aug-10	382.04	261.54	251.54	7.98	374.06
OW-102E	01-Aug-10	396.91	264.80	254.80	20.16	376.75
OW-200E	01-Aug-10	387.47	262.89	252.89	11.69	375.78
OW-201E	01-Aug-10	389.69	264.30	254.30	13.43	376.26
R-013E	01-Aug-10	387.22	262.24	252.24	10.94	376.28
R-014E	01-Aug-10	392.87	259.46	249.46	17.21	375.66

**Notes:**

Feet msl - feet above mean sea level

Feet TOC - feet below top of casing

NA - not applicable or not available

NM - not measured or could not be located

\* Measuring Point Elevations were surveyed on February 2, 2010 by Shawnee Survey & Consulting, Inc.



**Table 5**  
**2010 Average Horizontal Groundwater Flow Velocities**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

First Semi-Annual (February 14-15, 2010)					Second Semi-Annual (August 1, 2010)						
Well Pair	Horizontal Distance (feet)	Elevation Difference (feet)	Hydraulic Gradient (feet/feet)	Linear Flow Velocity (feet/day)	Well Pair	Horizontal Distance (feet)	Elevation Difference (feet)	Hydraulic Gradient (feet/feet)	Linear Flow Velocity (feet/day)		
<b>A/B-Unit</b> -- $k=7.92E-7$ ft/sec (6.8E-02 ft/day), $n_e = 0.10$ , $V_L = 3.8 E-3$ to 1.45E-2 ft/day Typical historical hydraulic gradient: 0.004 to 0.020 ft/ft											
S-003B to OW-042B	300	3.84	0.013	8.7E-03	OW-31A to OW-042B	660	6.42	0.010	6.6E-03		
OW-017A to OW-003A	1050	10.45	0.010	6.8E-03	OW-017A to OW-003A	1050	6.47	0.006	4.2E-03		
<b>Average</b>				<b>0.011</b>	<b>7.7E-03</b>	<b>Average</b>				<b>0.008</b>	<b>5.4E-03</b>
<b>C-Unit</b> -- $k=4.58E-8$ ft/sec (3.95E-03 ft/day), $n_e = 0.05$ , $V_L = 8.24E-5$ to 2.19E-4 ft/day Typical historical hydraulic gradient: 0.002 to 0.003 ft/ft											
R-014C to R-013C	240	0.71	0.0030	2.3E-04	R-014C to R-013C	240	1.00	0.0042	3.3E-04		
OW-017C to OW-036C	860	2.09	0.0024	1.9E-04	OW-017C to OW-036C	860	1.41	0.0016	1.3E-04		
<b>Average</b>				<b>0.0027</b>	<b>2.1E-04</b>	<b>Average</b>				<b>0.0029</b>	<b>2.3E-04</b>
<b>D-Unit</b> -- $k=1.85E-05$ ft/sec (1.6 ft/day), $n_e = 0.20$ , $V_L = 6.5E-3$ to 1.97E-2 ft/day Typical historical hydraulic gradient: 0.001 to 0.003 ft/ft											
OW-202D to OW-037D	1446	0.80	0.0006	4.4E-03	OW-202D to OW-037D	1446	0.92	0.0006	5.1E-03		
OW-017D to OW-010D	1247	1.15	0.0009	7.4E-03	OW-017D to OW-010D	1247	2.02	0.0016	1.3E-02		
<b>Average</b>				<b>0.0007</b>	<b>5.9E-03</b>	<b>Average</b>				<b>0.0011</b>	<b>9.0E-03</b>
<b>E-Unit</b> -- $k=5.33E-06$ ft/sec (4.61E-01 ft/day), $n_e = 0.05$ , $V_L = 8.57E-3$ to 1.7E-2 ft/day Typical historical hydraulic gradient: 0.002 to 0.004 ft/ft											
OW-035E to OW-102E	940	0.20	0.0002	2.0E-03	OW-102E to OW-033E	532	0.63	0.0012	1.1E-02		
OW-012E to OW-003E	500	1.05	0.0021	1.9E-02	OW-012E to OW-003E	500	1.70	0.0034	3.1E-02		
<b>Average</b>				<b>0.0012</b>	<b>1.1E-02</b>	<b>Average</b>				<b>0.0023</b>	<b>2.1E-02</b>

**Notes:**

$$v = (k * i) / n_e$$

Where:

- v = velocity
- k = hydraulic conductivity
- i = hydraulic gradient
- $n_e$  = effective porosity

$V_L$  = typical linear flow velocity of Unit



**Table 6**  
**2010 Vertical Hydraulic Gradients at Selected Well Clusters**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well Cluster	Vertical Gradient (feet/feet)	
	First Semi-Annual	Second Semi-Annual
<b>A- and B-Unit to C-Unit</b>		
OW-017A TO OW-017C	1.8E-01	8.0E-02
OW-027A TO OW-027C	1.5E-01	8.5E-02
OW-035B TO OW-035C	3.0E-01	1.9E-01
OW-036B TO OW-036C	2.5E-01	1.4E-01
OW-044A TO OW-044B	-5.2E-02	-4.4E-02
R-013A TO R-013C	1.4E-01	9.6E-02
<b>D-Unit to E-Unit</b>		
A-008D TO A-008E	2.2E-02	1.7E-02
OW-012D TO OW-012E	-5.8E-03	-2.3E-02
OW-027D TO OW-027E	2.7E-03	6.6E-04
OW-035DR TO OW-035E	1.7E-02	-6.7E-04
OW-102D TO OW-102E	2.5E-02	-9.2E-03
R-013D TO R-013E	-5.4E-04	-1.0E-02
R-014D TO R-014E	2.6E-02	2.9E-02

**Notes:**

Positive values indicate a downward vertical gradient.

Negative values indicate an upward vertical gradient.

The vertical gradient is calculated using the following equation:

$$i_v = (GWE_{\text{shallow}} - GWE_{\text{deep}}) / (Mp_{\text{shallow}} - Mp_{\text{deep}})$$

where:

$i_v$  = vertical gradient

$GWE_{\text{shallow}}$  = groundwater elevation of the shallow well

$GWE_{\text{deep}}$  = groundwater elevation of the deep well

$Mp_{\text{shallow}}$  = elevation of the midpoint of the shallow well screen

$Mp_{\text{deep}}$  = elevation of the midpoint of the deep well screen

**Table 7**  
**2010 Summary of Wells with Detections**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Constituent	Wells Detected				Lowest Detected Concentration (sample, event)	Highest Detected Concentration (sample, event)
	First Semi-Annual		Second Semi-Annual			
<b>Total PAHs <sup>(a)</sup></b>	OW-010B OW-017A OW-017C OW-022BR OW-023D OW-026A OW-027D OW-027E OW-031A OW-033E OW-035C OW-035DR OW-035E OW-036B OW-037B OW-037D OW-037D DUP OW-039DR OW-039DR DUP	OW-039ER OW-040D OW-040D DUP OW-041B OW-044D OW-044D DUP OW-102B OW-102E OW-200E OW-201E OW-201E DUP OW-202B OW-202D OW-204A OW-205A R-013A R-014C R-014E	OW-012D OW-023C OW-026A OW-026A DUP OW-033E OW-035B OW-035DR OW-035E OW-036B OW-201E OW-039BR2 OW-041B	OW-041D OW-044D DUP OW-102B OW-200E OW-202A OW-202D OW-204A OW-205A R-014C R-014D R-014E	0.19 (OW-202D, 2nd)	2571.6 (OW-205A, 2nd)
<b>Pentachlorophenol</b>	None		None		None	None
<b>BTEX <sup>(b)</sup></b>	OW-205A		OW-205A		31.6 (OW-205A, 2nd)	48.2 (OW-205A, 1st)
<b>Arsenic (Dissolved)</b>	OW-017C OW-026A OW-027A OW-035C	OW-041B OW-202D OW-205A R-014C	OW-017C OW-026A OW-026A DUP OW-027A OW-035C	OW-041B OW-041D OW-202D R-014C	10.3 (OW-205A, 1st)	281 (OW-026A, 2nd)
<b>Arsenic (Total)</b>	OW-017C OW-022BR OW-026A OW-027A	OW-035C OW-041B OW-202D R-014C	OW-017C OW-026A OW-026A DUP OW-027A OW-035C	OW-041B OW-041D OW-202D R-014C	11.1 (OW-017C, 1st)	279 (OW-026A DUP, 2nd)
<b>Chromium (Dissolved)</b>	OW-203A	OW-204B	OW-204B		5.4 (OW-203A, 1st)	32.7 (OW-204B, 1st)
<b>Chromium (Total)</b>	OW-010B OW-017C OW-022BR OW-023C OW-023D OW-027D OW-033E OW-036B OW-039BR2 OW-041A	OW-041B OW-044D OW-044D DUP OW-202B OW-203A OW-204A OW-204B OW-206A OW-207A	OW-010B OW-017C OW-022BR OW-023C OW-033E OW-035E OW-039BR2	OW-102B OW-203A OW-204A OW-204B OW-206A OW-207A	5 (OW-039BR2, 2nd)	695 (OW-022BR, 1st)
<b>Copper (Dissolved)</b>	OW-010B OW-027D	OW-102B OW-202B	None		29 (OW-027D, 1st)	242 (OW-010B, 1st)
<b>Copper (Total)</b>	OW-010B OW-027D	OW-102B OW-202B	None		117 (OW-102B, 1st)	1430 (OW-010B, 1st)
<b>Total Recoverable Phenolics</b>	OW-017C OW-027A OW-027E OW-033E OW-035C OW-035E OW-039DR DUP OW-039ER OW-042B OW-044D	OW-044D DUP OW-102B OW-102E OW-201E OW-201E DUP OW-202B OW-204A OW-205A R-014C R-014D	OW-026A OW-026A DUP OW-027A OW-027E OW-035DR	OW-035E OW-037D OW-200E OW-205A	0.011 (OW-017C, OW-102B, OW-102E, OW-202B, OW-204A, R-014D, 1st) (OW-200E, 2nd)	0.17 (OW-035E, 1st)

**Notes:**

<sup>(a)</sup> Wells in which at least one PAH compound was detected. Concentrations listed are total PAHs.

<sup>(b)</sup> Wells in which at least one BTEX compound was detected. Concentrations listed are total BTEX.



**Table 8**  
**Summary of TACO Tier 1 Exceedances**  
**First and Second Semi-Annual 2010 Sampling Events**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility - Carbondale, Illinois**

Well	Parameter	Sample Result (ug/L)	TACO Class I (D- and E-Unit Wells)	TACO Class II (A/B and C-Unit Wells)
<b>First Semi-Annual Sampling Event</b>				
<b>TACO Tier 1 Exceedance</b>				
OW-026A	Arsenic, dissolved	241		200
OW-102E	Benzo(a)anthracene	0.26	0.13	
	Benzo(b)fluoranthene	0.19	0.13	
	Benzo(k)fluoranthene	0.2	0.17	
OW-201E DUP	Benzo(a)anthracene	3.3	0.13	
	Benzo(a)pyrene	2.2	0.2	
	Benzo(b)fluoranthene	3.3	0.13	
	Benzo(k)fluoranthene	2.5	0.17	
	Chrysene	3	1.5	
	Dibenzo(a,h)anthracene	3.1	0.3	
	Indeno(1,2,3-cd)pyrene	3	0.43	
OW-205A	Naphthalene	1100		220
R-014C	Benzo(a)anthracene	1.4		0.65
	Benzo(b)fluoranthene	1.6		0.9
	Benzo(k)fluoranthene	1.3		0.85
<b>Second Semi-Annual Sampling Event</b>				
<b>TACO Tier 1 Exceedance</b>				
OW-026A	Arsenic, dissolved	281		200
OW-026A DUP	Arsenic, dissolved	280		200
OW-033E	Benzo(a)anthracene	0.38	0.13	
	Benzo(a)pyrene	0.27	0.2	
	Benzo(b)fluoranthene	0.38	0.13	
	Benzo(k)fluoranthene	0.37	0.17	
	Dibenzo(a,h)anthracene	0.37	0.3	
OW-205A	Naphthalene	2300		220

**Notes:**

TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standards are different for Class I (D and E unit wells) and Class II (A/B and C unit wells).



**Table 9**  
**Summary of Analytical Data Compared to the IWQC**  
**First and Second Semi-Annual 2010 Sampling Events**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	IWQC <sup>1,2</sup>		OW-041A 2/16/2010	OW-041A 8/3/2010	OW-041B 2/17/2010	OW-041B 8/3/2010	OW-205A 2/18/2010	OW-205A 8/5/2010	OW-206A 2/16/2010	OW-206A 8/2/2010	OW-207A 2/16/2010	OW-207A 8/2/2010
		Aquatic Life	Human Health										
<b>Metals (Method 6010B)</b>													
ARSENIC - SOLUBLE	UG/L	190	--	10 U	10 U	<b>19.1</b>	<b>28.4</b>	<b>10.3</b>	10 U	10 U	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	<b>24.5</b>	<b>42.2</b>	10 U	10 U	10 U	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	--	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	<b>11</b>	5 U	<b>6.4</b>	5 U	5 U	5 U	<b>7.5</b>	<b>22.5</b>	<b>10.5</b>	<b>21.6</b>
COPPER - SOLUBLE	UG/L	--	--	25 U	25 U								
COPPER - TOTAL	UG/L	--	--	25 U	25 U								
<b>BTEX (Method 8021B)</b>													
BENZENE	UG/L	860	310	1 U	1 U	1 U	1 U	<b>9.1</b>	<b>3.7</b>	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	14	--	1 U	1 U	1 U	1 U	<b>26</b>	<b>17</b>	1 U	1 U	1 U	1 U
TOLUENE	UG/L	600	--	1 U	1 U	1 U	1 U	<b>3.1</b>	<b>1.9</b>	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	360	--	1 U	1 U	1 U	1 U	<b>10</b>	<b>9</b>	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>													
PENTACHLOROPHENOL	UG/L	13	2.5	1.1 U	0.99 U	0.97 U	0.95 U	0.94 U	1 U	1.1 U	0.94 U	0.98 U	0.99 U
<b>SVOCs (Method 8270C SIM)</b>													
ACENAPHTHENE	UG/L	62	--	0.22 U	0.2 U	0.19 U	0.19 U	<b>45</b>	<b>110</b>	0.22 U	0.19 U	0.2 U	0.2 U
ACENAPHTHYLENE	UG/L	15	--	0.22 U	0.2 U	0.19 U	0.19 U	<b>0.74</b>	<b>1.2</b>	0.22 U	0.19 U	0.2 U	0.2 U
ANTHRACENE	UG/L	0.53	35,000	0.22 U	0.2 U	0.19 U	0.19 U	<b>2.4</b>	<b>5.7</b>	0.22 U	0.19 U	0.2 U	0.2 U
BENZO(A)ANTHRACENE	UG/L	--	0.16	0.14 U	0.13 U	0.13 U	0.12 U	0.12 U	0.13 U	0.14 U	0.12 U	0.13 U	0.13 U
BENZO(A)PYRENE	UG/L	--	0.016	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.22 U	0.19 U	0.2 U	0.2 U
BENZO(B)FLUORANTHENE	UG/L	--	0.16	0.19 U	0.18 U	0.17 U	0.17 U	0.17 U	0.19 U	0.19 U	0.17 U	0.18 U	0.18 U
BENZO(GHI)PERYLENE	UG/L	--	--	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.22 U	0.19 U	0.2 U	0.2 U
BENZO(K)FLUORANTHENE	UG/L	--	1.6	0.18 U	0.17 U	0.16 U	0.16 U	0.16 U	0.18 U	0.18 U	0.16 U	0.17 U	0.17 U
CHRYSENE	UG/L	--	16	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.22 U	0.19 U	0.2 U	0.2 U
DIBENZO(A,H)ANTHRACENE	UG/L	--	0.016	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.22 U	0.19 U	0.2 U	0.2 U
FLUORANTHENE	UG/L	1.8	120	0.22 U	0.2 U	0.19 U	0.19 U	<b>1.9</b>	<b>5.5</b>	0.22 U	0.19 U	0.2 U	0.2 U
FLUORENE	UG/L	16	4,500	0.22 U	0.2 U	0.19 U	0.19 U	<b>14</b>	<b>63</b>	0.22 U	0.19 U	0.2 U	0.2 U
INDENO(1,2,3-CD)PYRENE	UG/L	--	0.16	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.22 U	0.19 U	0.2 U	0.2 U
NAPHTHALENE	UG/L	68	--	0.22 U	0.2 U	0.19 U	0.19 U	<b>1100</b>	<b>2300</b>	0.22 U	0.19 U	0.2 U	0.2 U
PHENANTHRENE	UG/L	3.7	--	0.22 U	0.2 U	<b>0.24</b>	<b>0.24</b>	<b>17</b>	<b>84</b>	0.22 U	0.19 U	0.2 U	0.2 U
PYRENE	UG/L	--	3,500	0.22 U	0.2 U	0.19 U	0.19 U	<b>0.76</b>	<b>2.2</b>	0.22 U	0.19 U	0.2 U	0.2 U
<b>Phenolics (Method 9066)</b>													
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	0.01 U	<b>0.013 B</b>	<b>0.027 B</b>	0.01 U	0.01 U	0.01 U	0.01 U

**Notes:**

IWQC - Illinois Water Quality Criteria

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatle organic compounds

Shade ■■■ indicates concentration exceeds IWQC (Illinois Water Quality Criteria).

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

Bold - constituent detected

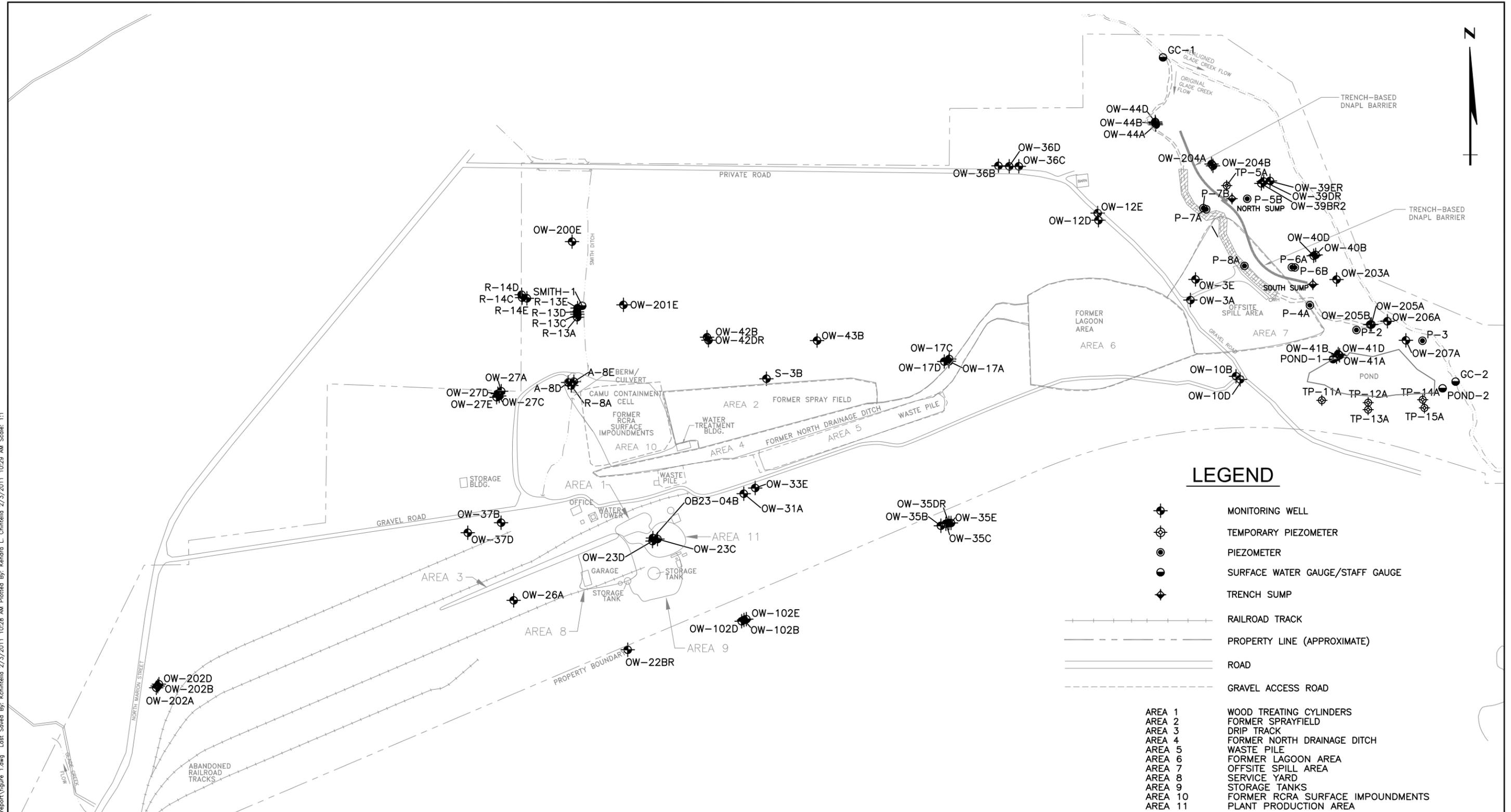
1 - For metals and BTEX, Illinois Water Quality Criteria obtained from 35 IAC 302.208. For PAHs and pentachlorophenol, Illinois Water Quality Criteria obtained from the following table:

<http://www.epa.sate.il.us/water/water-quality-standards/water-quality-criteria-list.pdf> Aquatic life criteria represent the lower of the Acute Aquatic (AATC) and the Chronic Aquatic Toxicity Criterion (CATC). Human health criteria represent the lower of the Human Threshold Criterion (HTC) and the Human Nonthreshold Criterion (HNC).

2 - IWQC are not applicable to groundwater, but comparison being done as requested by USEPA.

## **FIGURES**

c:\projects\beazer\_projects\carbondale\2010\_annual\_report\figure\_1.dwg Last Saved By: Kchintella 2/3/2011 10:28 AM Plotted By: Kendra L. Chintella 2/3/2011 10:29 AM Scale: 1:1

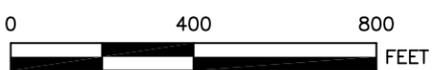


### LEGEND

- MONITORING WELL
- TEMPORARY PIEZOMETER
- PIEZOMETER
- SURFACE WATER GAUGE/STAFF GAUGE
- TRENCH SUMP
- RAILROAD TRACK
- PROPERTY LINE (APPROXIMATE)
- ROAD
- GRAVEL ACCESS ROAD
- AREA 1 WOOD TREATING CYLINDERS
- AREA 2 FORMER SPRAYFIELD
- AREA 3 DRIP TRACK
- AREA 4 FORMER NORTH DRAINAGE DITCH
- AREA 5 WASTE PILE
- AREA 6 FORMER LAGOON AREA
- AREA 7 OFFSITE SPILL AREA
- AREA 8 SERVICE YARD
- AREA 9 STORAGE TANKS
- AREA 10 FORMER RCRA SURFACE IMPOUNDMENTS
- AREA 11 PLANT PRODUCTION AREA

### NOTES:

- BASE MAP OBTAINED FROM ENVIRONMENTAL SCIENCE & ENGINEERING, INC., FEASIBILITY STUDY (BASEMAP.DXF), FEB 1995.
- BASE MAP INCLUDES LOCATIONS DIGITIZED FROM SITE SURVEY DRAWING BY BBL, BEAZERE.DWG, DATED 12/30/96, AT A SCALE OF 1" = 200' AND FROM AERIAL PHOTOGRAPHS TAKEN ON NOVEMBER 22, 1996 AT AN APPROXIMATE SCALE OF 1" = 500'.

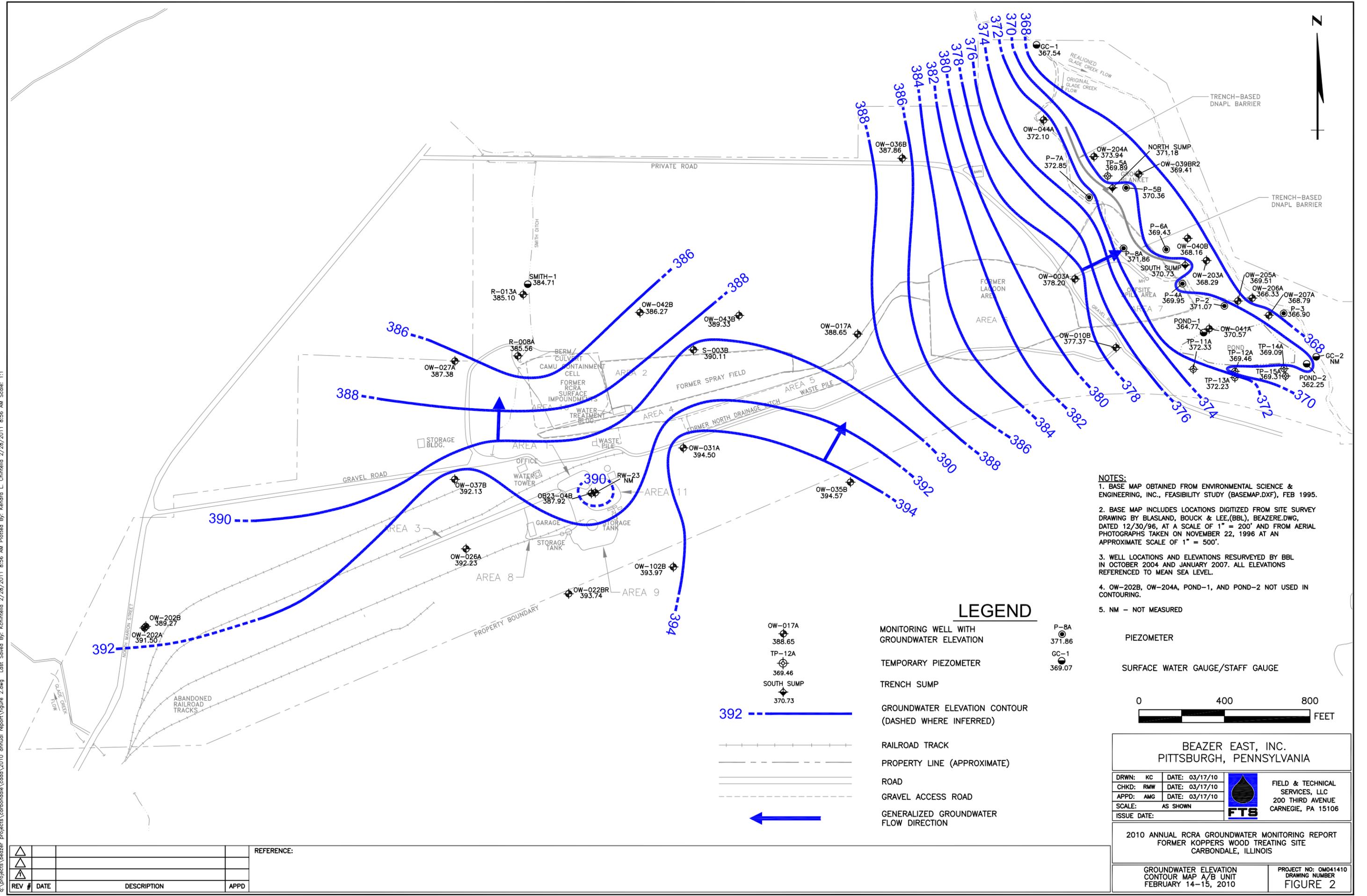


REV #	DATE	DESCRIPTION	APPD

REFERENCE:

<b>BEAZER EAST, INC.</b> PITTSBURGH, PENNSYLVANIA			FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106
DRWN: KC	DATE: 3/17/10		
CHKD: RMW	DATE: 3/17/10		
APPD: AMG	DATE: 3/17/10		
SCALE: AS SHOWN	ISSUE DATE:	2010 ANNUAL RCRA GROUNDWATER MONITORING REPORT FORMER KOPPERS WOOD TREATING SITE CARBONDALE, ILLINOIS	
SITE PLAN		PROJECT NO: OM041410 DRAWING NUMBER <b>FIGURE 1</b>	

c:\projects\beazer\_projects\carbondaile\2010\_annual\_report\Figure 2.dwg Last Saved By: Kchintella 2/28/2011 8:56 AM Plotted By: Kenndra L. Chintella 2/28/2011 8:56 AM Scale: 1:1



- NOTES:**
1. BASE MAP OBTAINED FROM ENVIRONMENTAL SCIENCE & ENGINEERING, INC., FEASIBILITY STUDY (BASEMAP.DXF), FEB 1995.
  2. BASE MAP INCLUDES LOCATIONS DIGITIZED FROM SITE SURVEY DRAWING BY BLASLAND, BOUCK & LEE, (BBL), BEAZERE.DWG, DATED 12/30/96, AT A SCALE OF 1" = 200' AND FROM AERIAL PHOTOGRAPHS TAKEN ON NOVEMBER 22, 1996 AT AN APPROXIMATE SCALE OF 1" = 500'.
  3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.
  4. OW-202B, OW-204A, POND-1, AND POND-2 NOT USED IN CONTOURING.
  5. NM - NOT MEASURED

**LEGEND**

<ul style="list-style-type: none"> <li>OW-017A 388.65</li> <li>TP-12A 369.46</li> <li>SOUTH SUMP 370.73</li> </ul>	<ul style="list-style-type: none"> <li>MONITORING WELL WITH GROUNDWATER ELEVATION</li> <li>TEMPORARY PIEZOMETER</li> <li>TRENCH SUMP</li> </ul>	<ul style="list-style-type: none"> <li>P-8A 371.86</li> <li>GC-1 369.07</li> </ul>	<ul style="list-style-type: none"> <li>PIEZOMETER</li> <li>SURFACE WATER GAUGE/STAFF GAUGE</li> </ul>										
<ul style="list-style-type: none"> <li>392 - - - - -</li> </ul>	<ul style="list-style-type: none"> <li>GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)</li> </ul>												
<ul style="list-style-type: none"> <li>— — — — —</li> </ul>	<ul style="list-style-type: none"> <li>RAILROAD TRACK</li> </ul>	<p style="text-align: center;"><b>BEAZER EAST, INC.</b> PITTSBURGH, PENNSYLVANIA</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DRWN: KC</td> <td>DATE: 03/17/10</td> <td rowspan="4" style="text-align: center;"></td> <td rowspan="4">FIELD &amp; TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106</td> </tr> <tr> <td>CHKD: RMW</td> <td>DATE: 03/17/10</td> </tr> <tr> <td>APPD: AMG</td> <td>DATE: 03/17/10</td> </tr> <tr> <td>SCALE: AS SHOWN</td> <td>ISSUE DATE:</td> </tr> </table>		DRWN: KC	DATE: 03/17/10		FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106	CHKD: RMW	DATE: 03/17/10	APPD: AMG	DATE: 03/17/10	SCALE: AS SHOWN	ISSUE DATE:
DRWN: KC	DATE: 03/17/10				FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106								
CHKD: RMW	DATE: 03/17/10												
APPD: AMG	DATE: 03/17/10												
SCALE: AS SHOWN	ISSUE DATE:												
<ul style="list-style-type: none"> <li>- - - - -</li> </ul>	<ul style="list-style-type: none"> <li>PROPERTY LINE (APPROXIMATE)</li> </ul>												
<ul style="list-style-type: none"> <li>==</li> </ul>	<ul style="list-style-type: none"> <li>ROAD</li> </ul>												
<ul style="list-style-type: none"> <li>- - - - -</li> </ul>	<ul style="list-style-type: none"> <li>GRAVEL ACCESS ROAD</li> </ul>												
<ul style="list-style-type: none"> <li>←</li> </ul>	<ul style="list-style-type: none"> <li>GENERALIZED GROUNDWATER FLOW DIRECTION</li> </ul>												

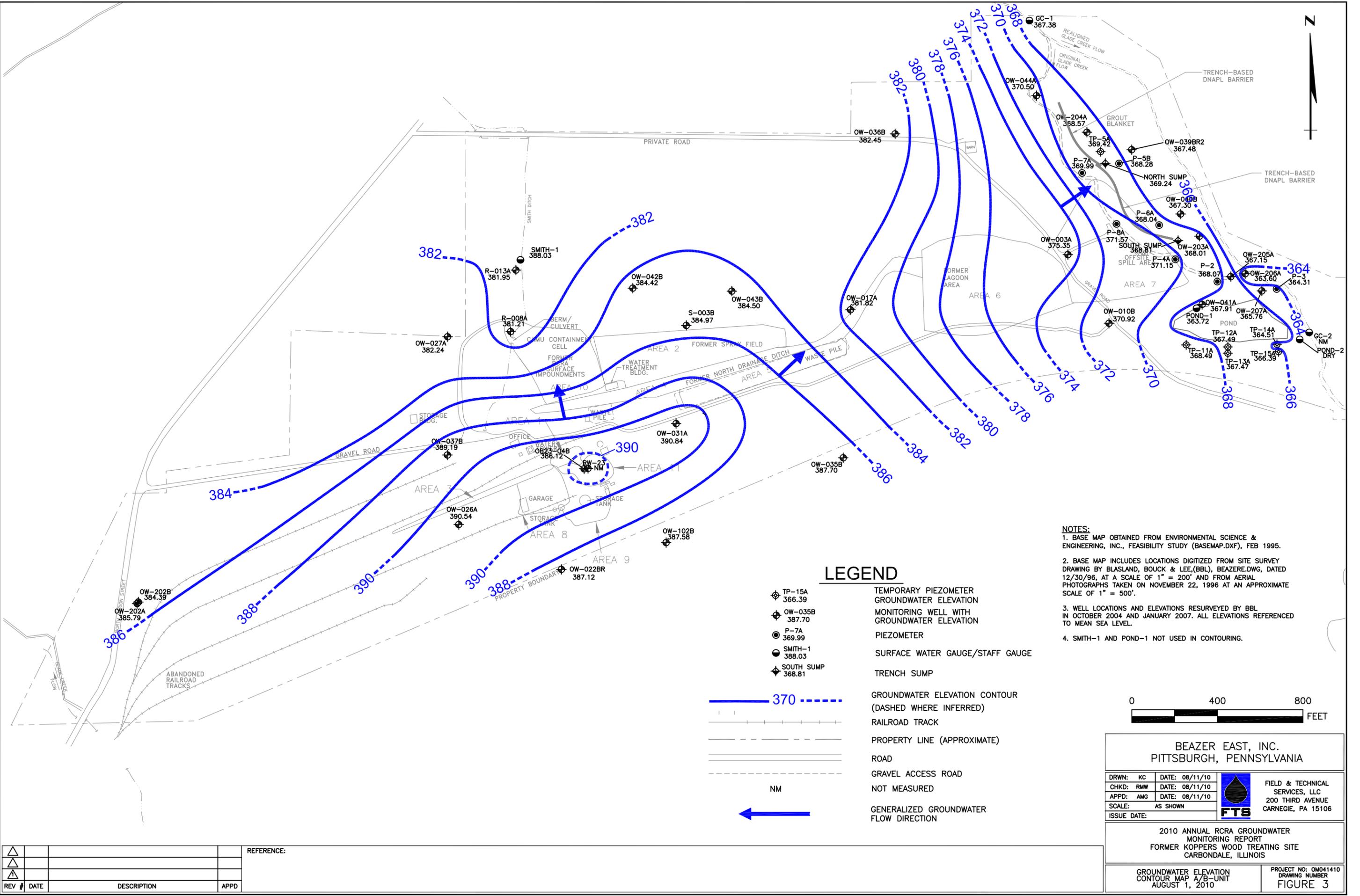
REV #	DATE	DESCRIPTION	APPD

REFERENCE:

2010 ANNUAL RCRA GROUNDWATER MONITORING REPORT  
FORMER KOPPERS WOOD TREATING SITE  
CARBONDALE, ILLINOIS

GROUNDWATER ELEVATION CONTOUR MAP A/B UNIT FEBRUARY 14-15, 2010	PROJECT NO: OM041410 DRAWING NUMBER FIGURE 2
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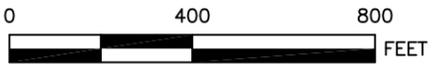
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- NOTES:**
1. BASE MAP OBTAINED FROM ENVIRONMENTAL SCIENCE & ENGINEERING, INC., FEASIBILITY STUDY (BASEMAP.DXF), FEB 1995.
  2. BASE MAP INCLUDES LOCATIONS DIGITIZED FROM SITE SURVEY DRAWING BY BLASLAND, BOUCK & LEE, (BBL), BEAZER.DWG, DATED 12/30/96, AT A SCALE OF 1" = 200' AND FROM AERIAL PHOTOGRAPHS TAKEN ON NOVEMBER 22, 1996 AT AN APPROXIMATE SCALE OF 1" = 500'.
  3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.
  4. SMITH-1 AND POND-1 NOT USED IN CONTOURING.

**LEGEND**

- TP-15A 366.39 TEMPORARY PIEZOMETER
- OW-035B 387.70 MONITORING WELL WITH GROUNDWATER ELEVATION
- P-7A 369.99 PIEZOMETER
- SMITH-1 388.03 SURFACE WATER GAUGE/STAFF GAUGE
- SOUTH SUMP 368.81 TRENCH SUMP
- 370 GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- RAILROAD TRACK
- PROPERTY LINE (APPROXIMATE)
- ROAD
- GRAVEL ACCESS ROAD
- NM NOT MEASURED
- GENERALIZED GROUNDWATER FLOW DIRECTION



BEAZER EAST, INC.  
PITTSBURGH, PENNSYLVANIA

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

2010 ANNUAL RCRA GROUNDWATER MONITORING REPORT  
FORMER KOPPERS WOOD TREATING SITE  
CARBONDALE, ILLINOIS

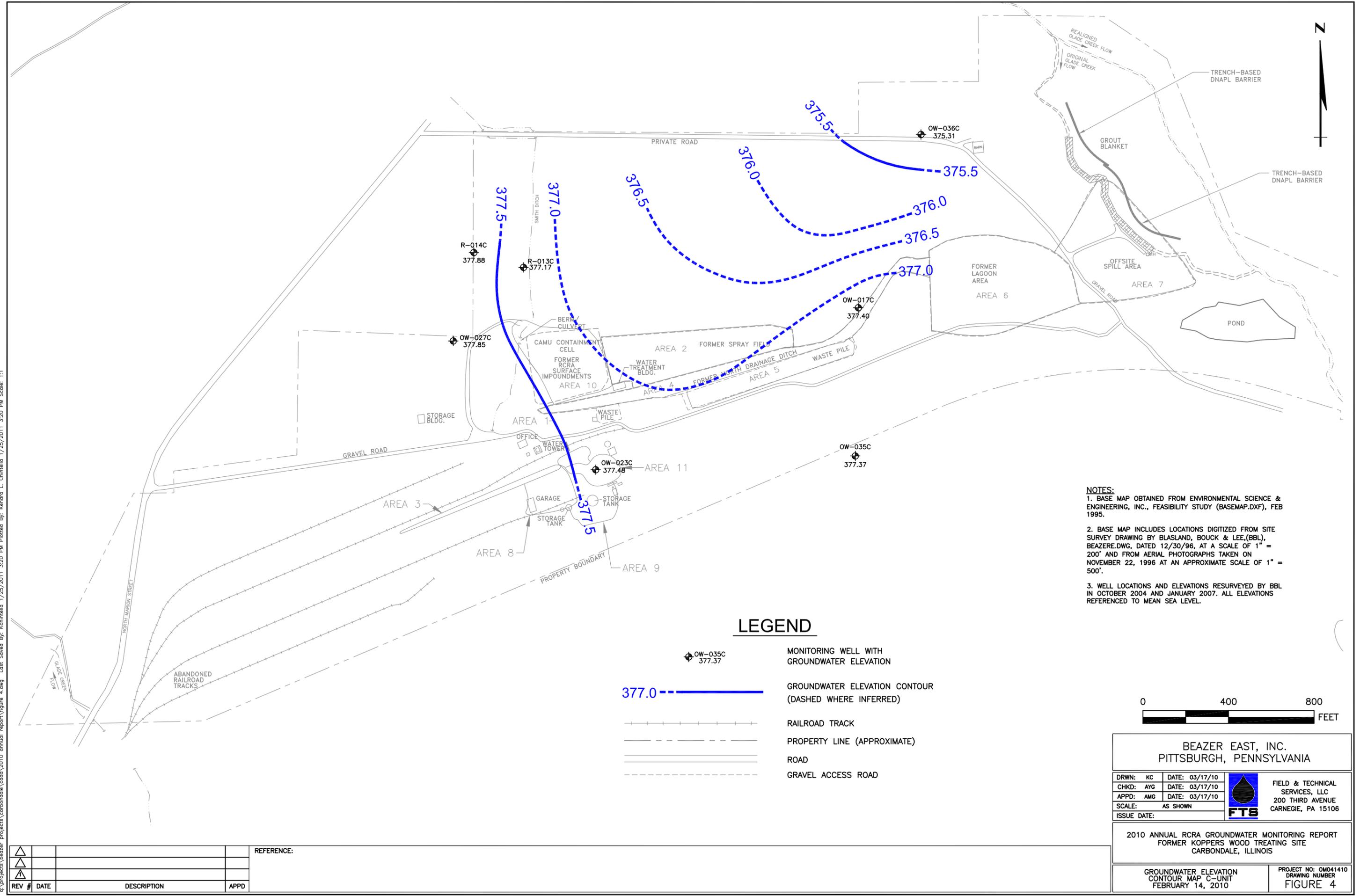
GROUNDWATER ELEVATION CONTOUR MAP A/B-UNIT  
AUGUST 1, 2010

PROJECT NO: OMO41410  
DRAWING NUMBER  
FIGURE 3

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

a:\projects\beazer\_projects\carbondale\2010 annual report\Figure 4.dwg Last Saved By: Kchintella 1/25/2011 3:20 PM Plotted By: Kchintella 1/25/2011 3:20 PM Scale: 1:1



**NOTES:**  
 1. BASE MAP OBTAINED FROM ENVIRONMENTAL SCIENCE & ENGINEERING, INC., FEASIBILITY STUDY (BASEMAP.DXF), FEB 1995.  
 2. BASE MAP INCLUDES LOCATIONS DIGITIZED FROM SITE SURVEY DRAWING BY BLASLAND, BOUCK & LEE (BBL), BEAZER.DWG, DATED 12/30/96, AT A SCALE OF 1" = 200' AND FROM AERIAL PHOTOGRAPHS TAKEN ON NOVEMBER 22, 1996 AT AN APPROXIMATE SCALE OF 1" = 500'.  
 3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

**LEGEND**

- MONITORING WELL WITH GROUNDWATER ELEVATION
- GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- RAILROAD TRACK
- PROPERTY LINE (APPROXIMATE)
- ROAD
- GRAVEL ACCESS ROAD



BEAZER EAST, INC.  
 PITTSBURGH, PENNSYLVANIA

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SCALE: AS SHOWN	
ISSUE DATE:	



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

2010 ANNUAL RCRA GROUNDWATER MONITORING REPORT  
 FORMER KOPPERS WOOD TREATING SITE  
 CARBONDALE, ILLINOIS

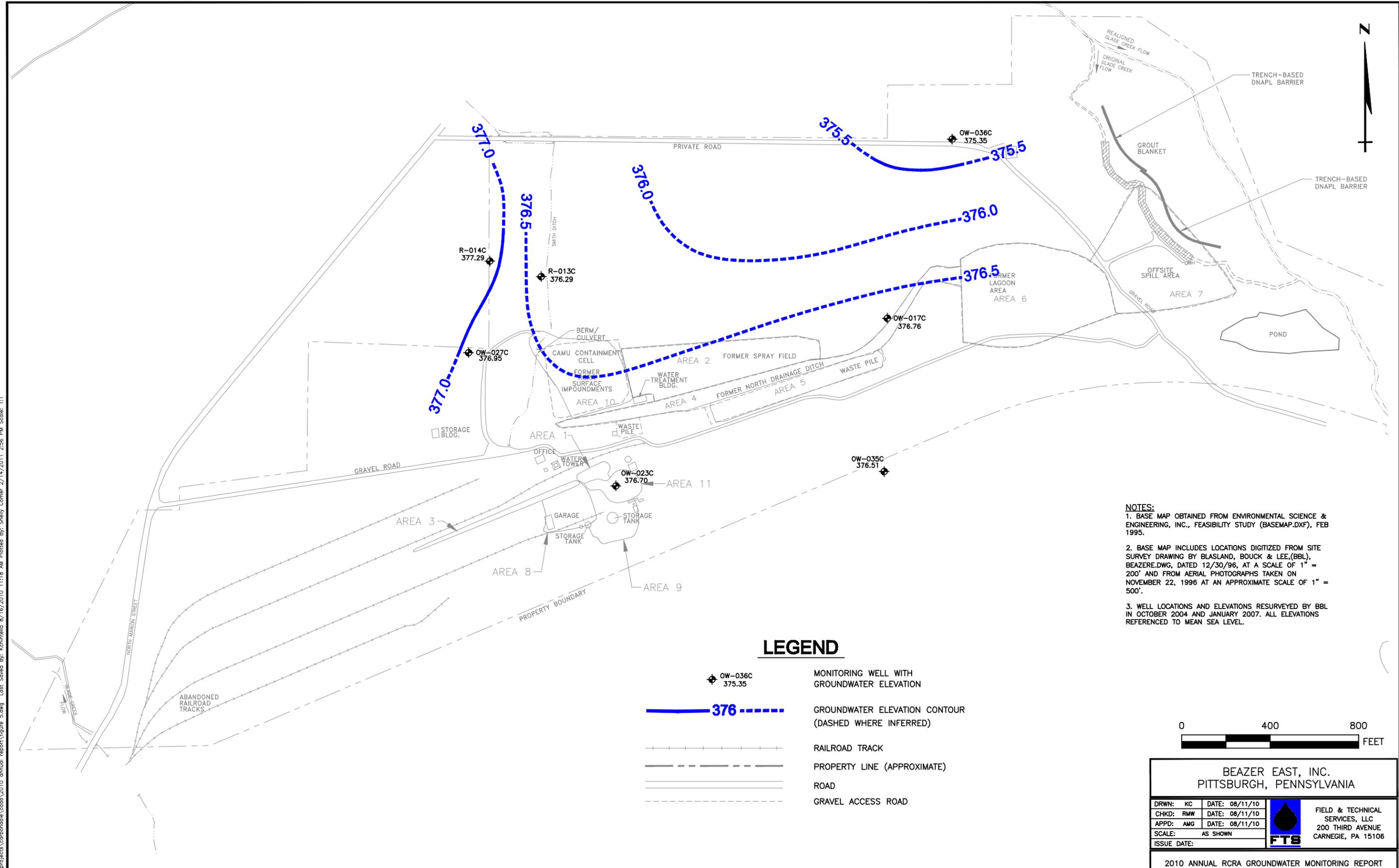
GROUNDWATER ELEVATION  
 CONTOUR MAP C-UNIT  
 FEBRUARY 14, 2010

PROJECT NO: OM041410  
 DRAWING NUMBER  
**FIGURE 4**

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

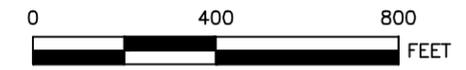
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**NOTES:**  
 1. BASE MAP OBTAINED FROM ENVIRONMENTAL SCIENCE & ENGINEERING, INC., FEASIBILITY STUDY (BASEMAP.DXF), FEB 1995.  
 2. BASE MAP INCLUDES LOCATIONS DIGITIZED FROM SITE SURVEY DRAWING BY BLASLAND, BOUCK & LEE.(BBL), BEAZER.DWG, DATED 12/30/96, AT A SCALE OF 1" = 200' AND FROM AERIAL PHOTOGRAPHS TAKEN ON NOVEMBER 22, 1996 AT AN APPROXIMATE SCALE OF 1" = 500'.  
 3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

**LEGEND**

- MONITORING WELL WITH GROUNDWATER ELEVATION
- GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- RAILROAD TRACK
- PROPERTY LINE (APPROXIMATE)
- ROAD
- GRAVEL ACCESS ROAD



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SCALE: AS SHOWN	
ISSUE DATE:	



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

2010 ANNUAL RCRA GROUNDWATER MONITORING REPORT  
 FORMER KOPPERS WOOD TREATING SITE  
 CARBONDALE, ILLINOIS

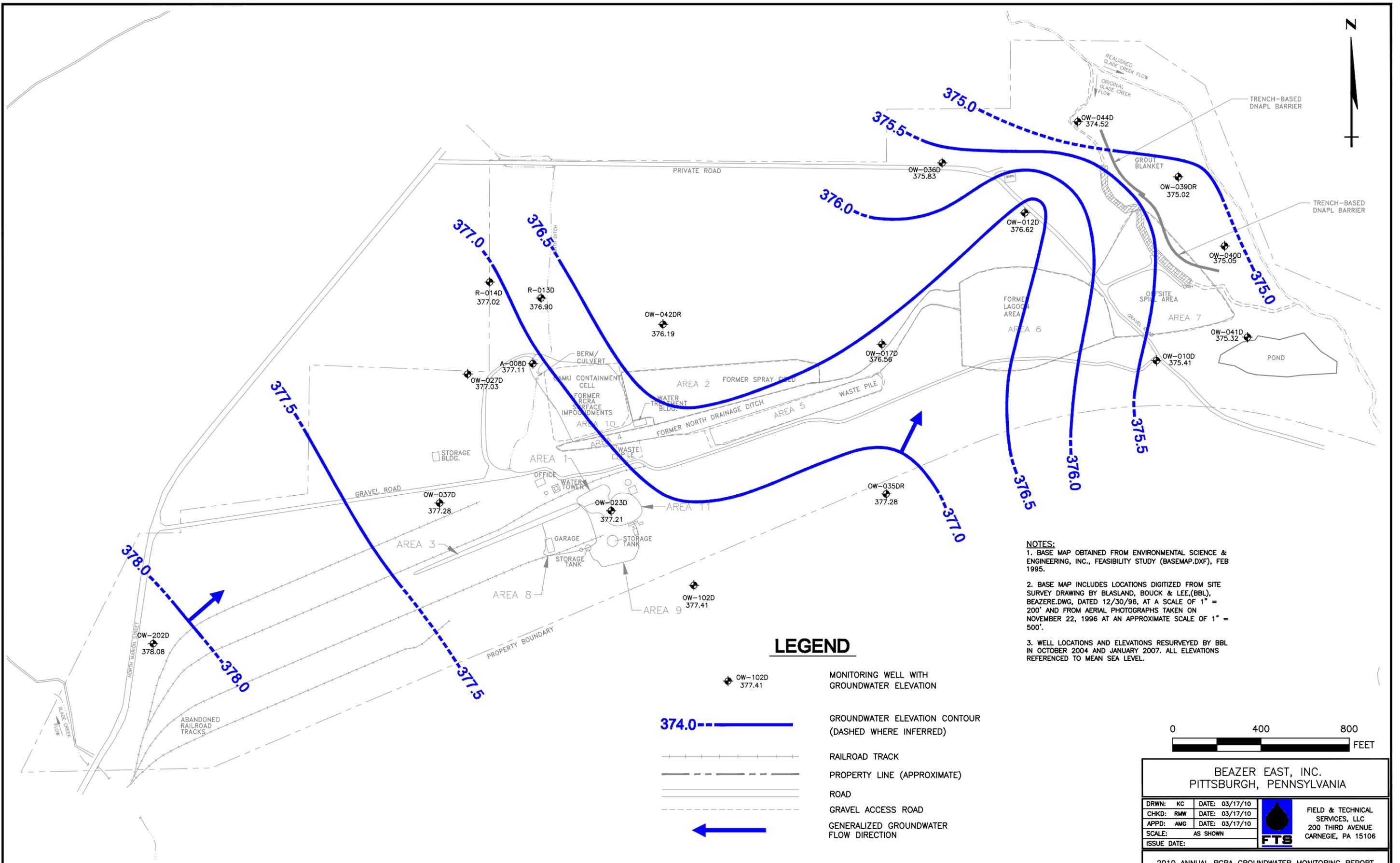
GROUNDWATER ELEVATION CONTOUR MAP C-UNIT  
 AUGUST 1, 2010

PROJECT NO: 0M041410  
 DRAWING NUMBER  
**FIGURE 5**

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

c:\projects\beazer\_projects\carbondaile\2010\_annual\_report\figure\_6.dwg Last Saved By: Scanner 2/14/2011 3:08 PM Plotted By: Shelly Comer 2/14/2011 3:09 PM Scale: 1:1



- NOTES:**
1. BASE MAP OBTAINED FROM ENVIRONMENTAL SCIENCE & ENGINEERING, INC., FEASIBILITY STUDY (BASEMAP.DXF), FEB 1995.
  2. BASE MAP INCLUDES LOCATIONS DIGITIZED FROM SITE SURVEY DRAWING BY BLASLAND, BOUCK & LEE, (BBL), BEAZER.DWG, DATED 12/30/96, AT A SCALE OF 1" = 200' AND FROM AERIAL PHOTOGRAPHS TAKEN ON NOVEMBER 22, 1996 AT AN APPROXIMATE SCALE OF 1" = 500'.
  3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

**LEGEND**

- OW-102D 377.41 MONITORING WELL WITH GROUNDWATER ELEVATION
- 374.0--- GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- RAILROAD TRACK
- PROPERTY LINE (APPROXIMATE)
- ROAD
- GRAVEL ACCESS ROAD
- GENERALIZED GROUNDWATER FLOW DIRECTION



BEAZER EAST, INC.  
PITTSBURGH, PENNSYLVANIA

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CHKD: RMW	DATE: 03/17/10
APPD: AMG	DATE: 03/17/10
SCALE: AS SHOWN	
ISSUE DATE:	

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

2010 ANNUAL RCRA GROUNDWATER MONITORING REPORT  
FORMER KOPPERS WOOD TREATING SITE  
CARBONDALE, ILLINOIS

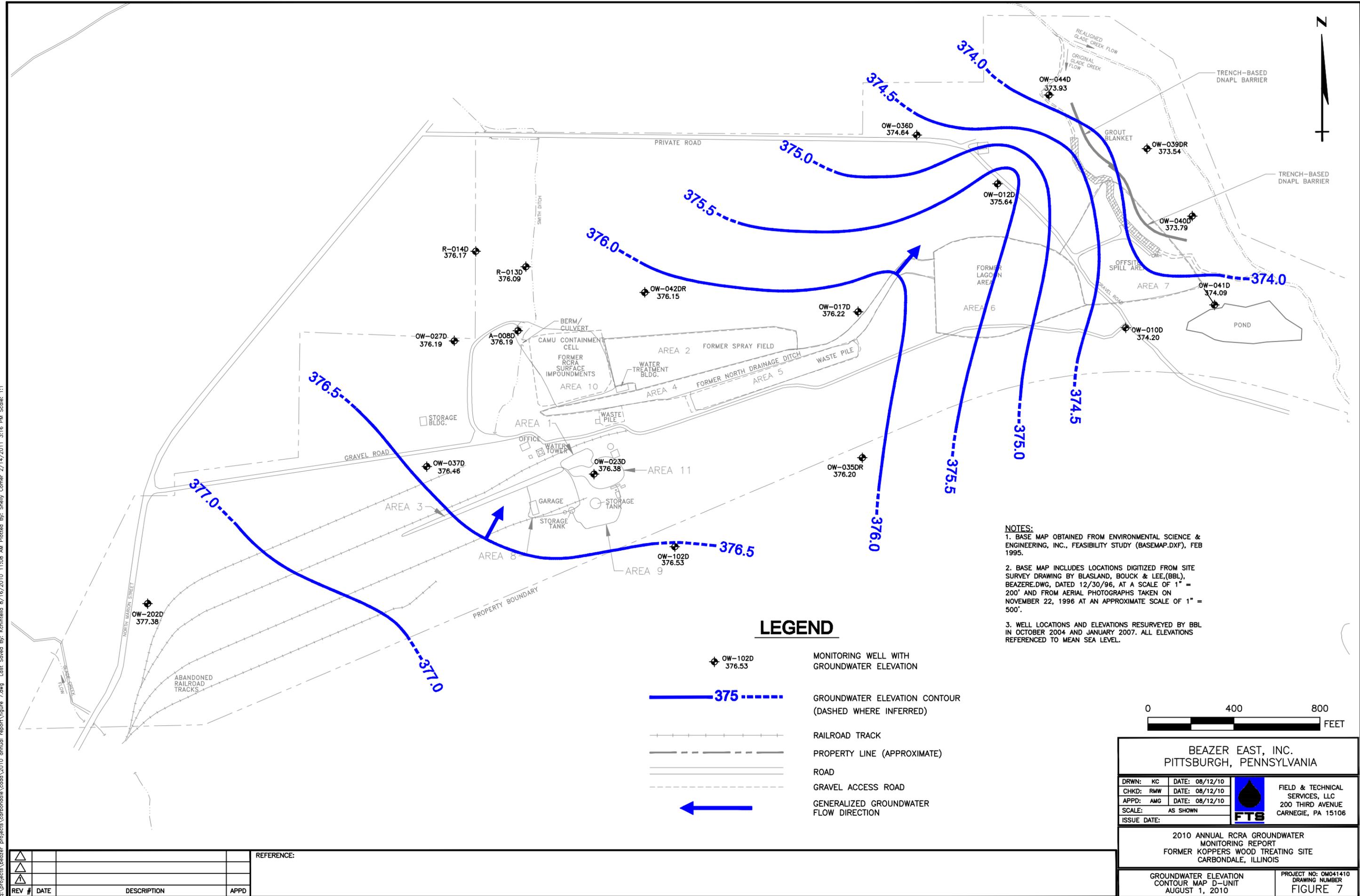
GROUNDWATER ELEVATION CONTOUR MAP D-UNIT  
FEBRUARY 14, 2010

PROJECT NO: OM041410  
DRAWING NUMBER  
FIGURE 6

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

c:\projects\beazer\_projects\carbondale\2010\_annual\_report\Figure\_7.dwg - Last Saved By: Kchintala 8/16/2010 11:08 AM Plotted By: Shelly Comer 2/14/2011 3:16 PM Scale: 1:1



**NOTES:**  
 1. BASE MAP OBTAINED FROM ENVIRONMENTAL SCIENCE & ENGINEERING, INC., FEASIBILITY STUDY (BASEMAP.DXF), FEB 1995.  
 2. BASE MAP INCLUDES LOCATIONS DIGITIZED FROM SITE SURVEY DRAWING BY BLASLAND, BOUCK & LEE, (BBL), BEAZER.DWG, DATED 12/30/96, AT A SCALE OF 1" = 200' AND FROM AERIAL PHOTOGRAPHS TAKEN ON NOVEMBER 22, 1996 AT AN APPROXIMATE SCALE OF 1" = 500'.  
 3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

**LEGEND**

- MONITORING WELL WITH GROUNDWATER ELEVATION
- GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- RAILROAD TRACK
- PROPERTY LINE (APPROXIMATE)
- ROAD
- GRAVEL ACCESS ROAD
- GENERALIZED GROUNDWATER FLOW DIRECTION



BEAZER EAST, INC.  
 PITTSBURGH, PENNSYLVANIA

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APPD: AMG	DATE: 08/12/10
SCALE: AS SHOWN	
ISSUE DATE:	

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

2010 ANNUAL RCRA GROUNDWATER MONITORING REPORT  
 FORMER KOPPERS WOOD TREATING SITE  
 CARBONDALE, ILLINOIS

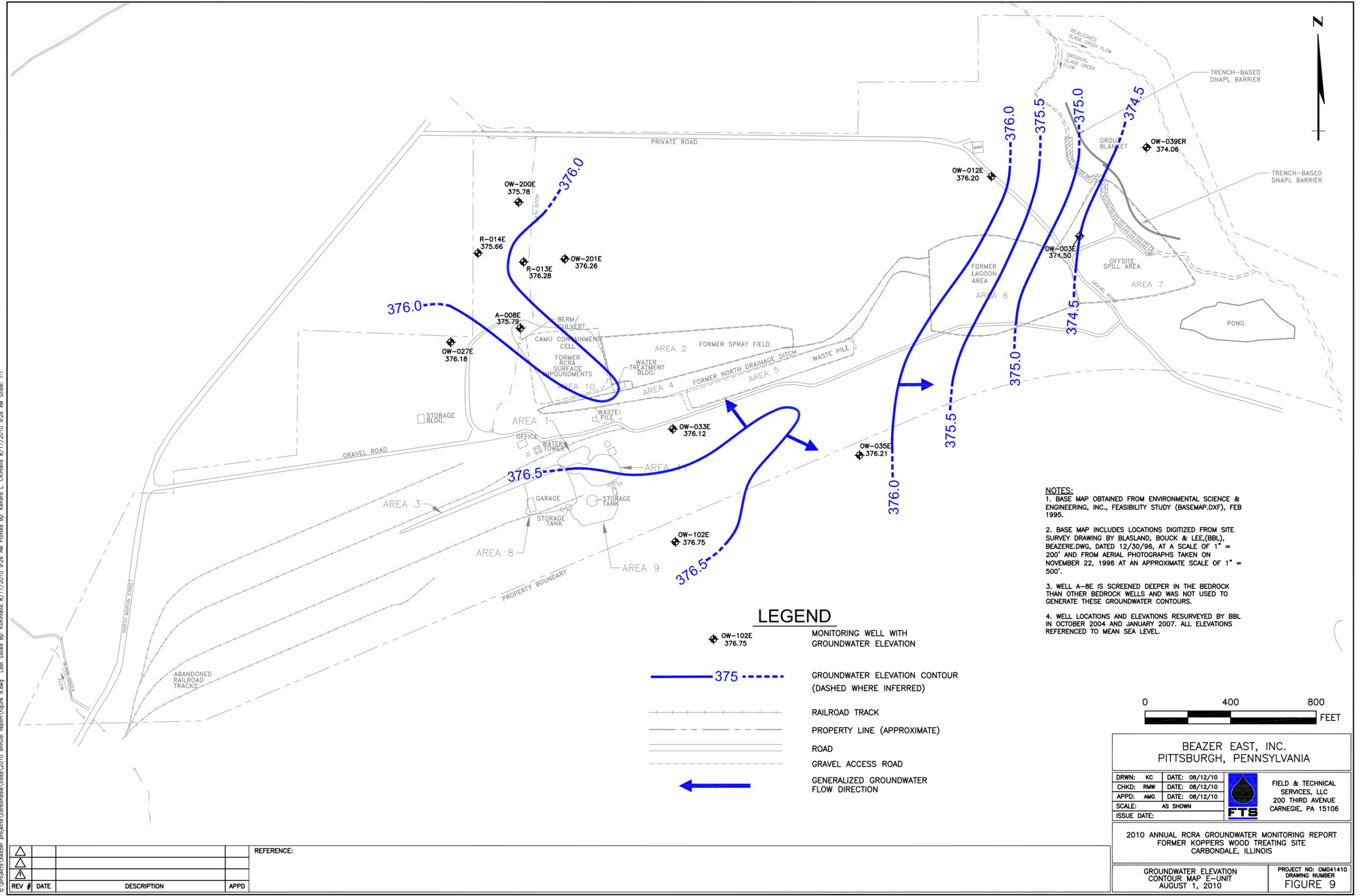
GROUNDWATER ELEVATION CONTOUR MAP D-UNIT  
 AUGUST 1, 2010  
 PROJECT NO: OM041410  
 DRAWING NUMBER  
 FIGURE 7

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

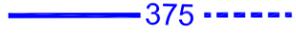


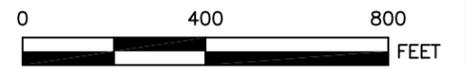
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- NOTES:**
1. BASE MAP OBTAINED FROM ENVIRONMENTAL SCIENCE & ENGINEERING, INC., FEASIBILITY STUDY (BASEMAP.DXF), FEB 1995.
  2. BASE MAP INCLUDES LOCATIONS DIGITIZED FROM SITE SURVEY DRAWING BY BLASLAND, BOUCK & LEE,(BBL), BEAZER.DWG, DATED 12/30/96, AT A SCALE OF 1" = 200' AND FROM AERIAL PHOTOGRAPHS TAKEN ON NOVEMBER 22, 1996 AT AN APPROXIMATE SCALE OF 1" = 500'.
  3. WELL A-8E IS SCREENED DEEPER IN THE BEDROCK THAN OTHER BEDROCK WELLS AND WAS NOT USED TO GENERATE THESE GROUNDWATER CONTOURS.
  4. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

**LEGEND**

-  OW-102E 376.75 MONITORING WELL WITH GROUNDWATER ELEVATION
-  375 - - - - GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
-  RAILROAD TRACK
-  PROPERTY LINE (APPROXIMATE)
-  ROAD
-  GRAVEL ACCESS ROAD
-  GENERALIZED GROUNDWATER FLOW DIRECTION



BEAZER EAST, INC.  
PITTSBURGH, PENNSYLVANIA

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SCALE: AS SHOWN	
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FIELD & TECHNICAL SERVICES, LLC  
200 THIRD AVENUE  
CARNEGIE, PA 15106

2010 ANNUAL RCRA GROUNDWATER MONITORING REPORT  
FORMER KOPPERS WOOD TREATING SITE  
CARBONDALE, ILLINOIS

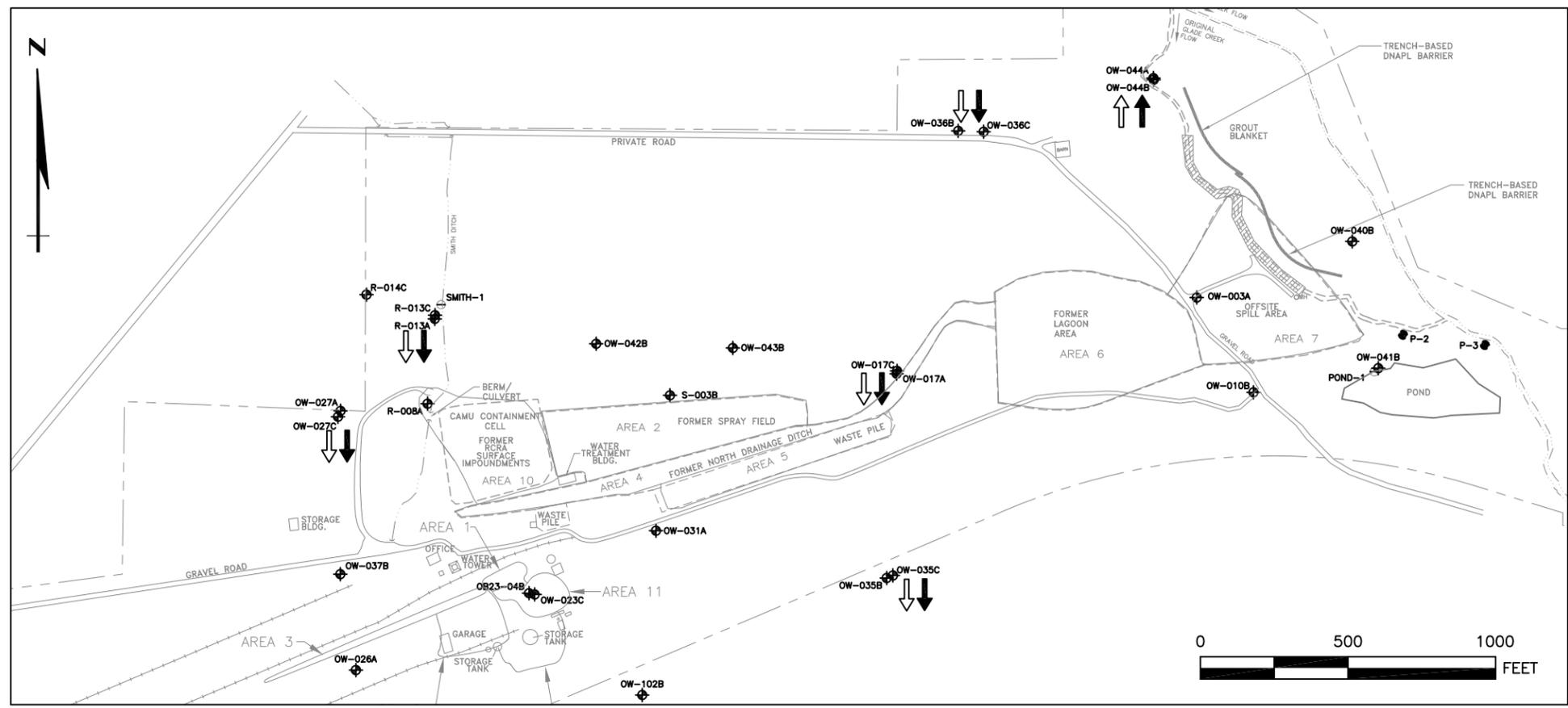
GROUNDWATER ELEVATION CONTOUR MAP E-UNIT  
AUGUST 1, 2010

PROJECT NO: 0M041410  
DRAWING NUMBER  
FIGURE 9

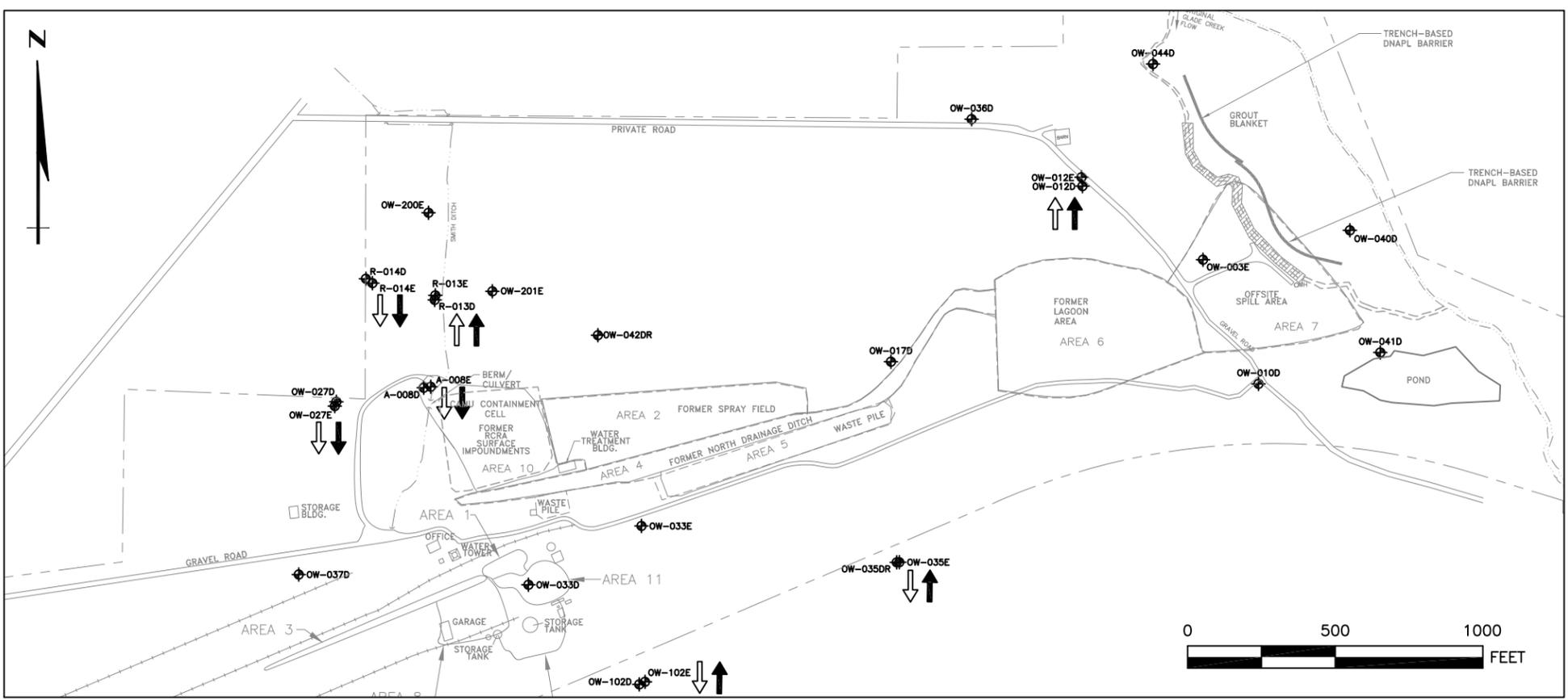
REV #	DATE	DESCRIPTION	APPD

REFERENCE:

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A-UNIT  
B-UNIT  
C-UNIT



D-UNIT  
E-UNIT

**LEGEND**

- OW-017D MONITORING WELL
- P-3 PIEZOMETER
- SMITH-1 SURFACE WATER GAUGE
- ↑ FIRST SEMIANNUAL VERTICAL HYDRAULIC GRADIENT DIRECTION
- ↑ SECOND SEMIANNUAL VERTICAL HYDRAULIC GRADIENT DIRECTION
- RAILROAD TRACK
- PROPERTY LINE (APPROXIMATE)
- ROAD
- GRAVEL ACCESS ROAD

**BEAZER EAST, INC.**  
PITTSBURGH, PENNSYLVANIA

DRWN: KC	DATE: 09/27/10	 <b>FTS</b>	FIELD & TECHNICAL SERVICES, LLC
CHKD: RMW	DATE: 09/27/10		200 THIRD AVENUE
APPD: AMG	DATE: 09/27/10		CARNEGIE, PA 15106
SCALE: AS SHOWN	ISSUE DATE:		

2010 ANNUAL RCRA GROUNDWATER MONITORING REPORT  
FORMER KOPPERS WOOD TREATING SITE  
CARBONDALE, ILLINOIS

2010 VERTICAL HYDRAULIC GRADIENT DIRECTIONS	PROJECT NO: OM041410 DRAWING NUMBER <b>FIGURE 10</b>
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REV #	DATE	DESCRIPTION	APPD

REFERENCE:

## **APPENDIX A**

### **SUMMARY OF 2010 FIELD AND ANALYTICAL DATA**

**Table A-1**  
**Groundwater Field Parameter Data**  
**First Semi-Annual 2010**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well	pH (SU)	Specific Conductivity (µS/cm)	Temperature (°C)	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)
<b>A Unit</b>						
OW-017A	8.86	1052	5.40	63.1	3.66	18.30
OW-026A	6.40	1447	10.80	-85.1	0.34	15.00
OW-027A	6.56	2106	8.00	18.7	0.42	18.00
OW-031A	7.67	697	6.85	38.3	0.75	12.00
OW-041A	7.35	1522	9.95	-15.8	0.41	8.37
OW-202A	6.45	529	9.09	188.1	0.90	2.19
OW-203A	6.43	5281	9.82	106.0	0.27	3.37
OW-204A	6.81	1783	9.98	137.5	0.42	6.75
OW-205A	6.35	1579	11.47	-6.5	0.88	15.00
OW-206A	6.62	7617	8.07	14.4	0.26	14.90
OW-207A	7.17	1072	4.71	144.9	2.03	9.08
R-013A	6.44	2267	5.09	96.5	0.27	9.00
<b>B Unit</b>						
OW-010B	6.92	2916	12.10	-66.7	0.74	6.56
OW-022BR	6.49	6881	8.83	5.5	0.24	17.60
OW-035B	8.67	647	12.10	139.7	0.81	7.65
OW-036B	6.69	2793	11.51	-175.3	0.49	2.80
OW-037B	6.95	3915	7.19	7.2	1.14	11.00
OW-039BR2	7.21	3348	12.16	162.8	0.79	2.18
OW-040B	7.36	4010	13.96	27.6	0.58	9.71
OW-041B	8.04	366	12.83	-113.6	0.75	9.01
OW-042B	6.59	2737	14.56	192.7	1.00	9.71
OW-102B	6.90	2574	13.15	233.6	0.96	3.73
OW-202B	6.85	2368	13.25	154.5	0.43	8.95
OW-204B	8.57	4452	9.51	108.1	0.78	0.79
<b>C Unit</b>						
OW-017C	7.59	2690	8.04	191.8	0.52	3.62
OW-023C	7.82	3261	13.24	169.8	1.18	7.50
OW-035C	7.53	2296	11.63	-118.0	0.42	3.50
R-014C	7.32	2815	11.13	-129.3	0.41	8.70
<b>D Unit</b>						
OW-012D	7.92	1155	10.15	206.4	0.96	8.41
OW-023D	8.26	2450	13.62	149.6	0.89	1.44
OW-027D	8.64	4526	13.28	-144.5	0.70	4.16
OW-035DR	12.70	6427	12.20	-383.6	0.34	2.21
OW-037D	9.41	7819	13.76	-161.2	0.50	0.94
OW-039DR	8.14	2118	13.45	-169.3	0.40	6.60
OW-040D	7.51	2009	7.85	-155.3	0.30	18.00
OW-041D	8.43	280	10.57	-142.9	0.46	1.40
OW-044D	12.75	2965	9.87	-178.1	0.45	14.30
OW-102D	10.80	2342	14.25	88.9	0.85	3.14
OW-202D	8.30	2187	11.94	55.7	0.94	3.63
R-014D	11.95	3496	13.42	112.4	0.25	4.22
<b>E Unit</b>						
OW-027E	12.79	8649	6.90	-210.0	0.67	9.64
OW-033E	7.29	9968	6.51	-87.6	0.62	9.30
OW-035E	12.08	8846	13.24	-95.4	0.16	11.40
OW-039ER	7.89	3402	6.26	-149.7	1.07	15.00
OW-102E	7.30	15450	11.12	-80.0	1.03	0.31
OW-200E	8.78	1405	11.96	-320.7	0.80	2.98
OW-201E	12.56	7349	14.01	-122.2	0.11	5.59
R-014E	9.41	17490	13.01	133.2	0.16	12.10

Notes

°C = degree celsius  
mg/l = milligrams per liter  
mV = millivolts  
NTU = nephelometric turbidity unit  
SU = standard units  
uS/cm = microSiemens per centimeter

**Table A-2**  
**Groundwater Field Parameter Data**  
**Second Semi-Annual 2010**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well	pH (SU)	Specific Conductivity (µS/cm)	Temperature (°C)	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)
<b>A Unit</b>						
OW-017A	7.15	1090	18.18	49.3	0.88	5.36
OW-026A	6.39	1262	19.54	-95.3	1.16	19.1
OW-027A	6.65	1690	21.41	-13.2	0.78	10.8
OW-031A	6.49	689	21.92	-23.1	0.80	15.0
OW-041A	7.20	1521	21.18	30.8	0.55	3.98
OW-202A	6.19	983	20.61	114.1	1.05	2.01
OW-203A	6.42	5159	19.11	8.8	0.89	5.33
OW-204A	6.82	2032	21.37	42.1	0.80	7.04
OW-205A	6.58	398	19.41	-123.5	0.22	12.5
OW-206A	6.58	8491	22.95	-27.3	0.71	10.57
OW-207A	7.31	1125	18.45	-60.7	0.17	7.77
R-013A	5.91	1983	20.46	-43.8	0.65	4.91
<b>B Unit</b>						
OW-010B	6.84	2818	19.95	-45.6	0.16	8.55
OW-022BR	6.91	4576	18.69	-12.7	1.25	15.5
OW-035B	7.44	878	17.85	-100.2	1.20	2.29
OW-036B	6.23	1993	24.26	-215.3	0.83	1.49
OW-037B	6.47	3688	27.25	-120.4	0.58	4.88
OW-039BR2	7.44	4795	19.89	-1.0	1.19	16.4
OW-040B	8.01	4624	19.35	-110.1	0.83	4.87
OW-041B	7.45	1287	19.01	-118.1	0.08	21.6
OW-042B	6.80	4254	18.21	-21.2	1.06	4.55
OW-102B	6.44	3405	18.93	-40.2	0.96	3.51
OW-202B	6.62	2810	20.61	2.7	1.68	6.99
OW-204B	8.54	3951	23.94	77.4	0.77	1.05
<b>C Unit</b>						
OW-017C	7.45	2189	19.90	-88.2	0.15	6.69
OW-023C	7.33	3722	21.55	-66.2	0.88	9.62
OW-035C	6.80	2003	18.45	-21.3	1.84	7.19
R-014C	7.00	2496	21.73	-140.2	0.69	1.70
<b>D Unit</b>						
OW-012D	8.08	1569	17.11	-124.2	0.14	7.55
OW-023D	8.33	2727	18.26	-78.1	0.53	5.89
OW-027D	7.45	4743	18.85	-140.1	0.17	2.54
OW-035DR	12.31	5211	19.93	-345.2	0.10	13.1
OW-037D	9.42	7241	18.60	-214.8	0.76	2.19
OW-039DR	7.45	1877	16.24	-160.7	1.25	3.19
OW-040D	7.65	1761	21.87	-165.2	0.14	51.3
OW-041D	7.69	1794	21.79	-141.2	1.20	4.42
OW-044D	8.07	1381	17.56	-195.2	0.21	2.88
OW-102D	12.38	3824	18.03	-85.4	1.5	5.72
OW-202D	7.88	3274	17.24	-148.1	0.11	4.25
R-014D	11.00	4780	16.11	-60.1	1.23	4.30
<b>E Unit</b>						
OW-027E	11.64	7862	19.25	-168.7	1.19	9.14
OW-033E	7.16	8925	19.35	-64.2	1.55	7.90
OW-035E	11.83	7356	18.78	-190.2	1.37	36.0
OW-039ER	7.48	2860	18.86	-149.2	1.12	8.11
OW-102E	7.31	12100	18.87	-79.5	0.29	11.7
OW-200E	8.60	12190	20.37	-174.3	0.86	3.53
OW-201E	12.37	5688	17.98	-379.7	0.13	8.16
R-014E	9.28	14600	19.50	-226.8	0.09	18.2

Notes

°C = degree celsius  
mg/l = milligrams per liter  
mV = millivolts  
NTU = nephelometric turbidity unit  
SU = standard units  
µS/cm = microSiemens per centimeter

**Table A-3**  
**Analytical Summary**  
**First Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-010B 2/17/2010	OW-012D 2/15/2010	OW-017A 2/15/2010	OW-017C 2/17/2010	OW-022BR 2/18/2010	OW-023C 2/16/2010	OW-023D 2/16/2010	OW-026A 2/18/2010	OW-027A 2/18/2010	OW-027D 2/17/2010	OW-027E 2/15/2010
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	<b>10.9</b>	10 U	10 U	10 U	<b>241</b>	<b>23.8</b>	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	<b>11.1</b>	<b>11.9</b>	10 U	10 U	<b>260</b>	<b>32.8</b>	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	<b>100</b>	5 U	5 U	<b>43.9</b>	<b>695</b>	<b>236</b>	<b>23.8</b>	5 U	5 U	<b>32</b>	5 U
COPPER - SOLUBLE	UG/L	650	650	<b>242</b>	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	<b>29</b>	25 U
COPPER - TOTAL	UG/L	--	--	<b>1430</b>	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	<b>346</b>	25 U
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	0.98 U	0.94 U	1 U	0.99 U	0.97 U	0.94 U	0.96 U	1 U	0.94 U	0.95 U	0.97 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.19 U	0.2 U	0.2 U	<b>30</b>	0.19 U	0.19 U	<b>1.8</b>	0.19 U	0.19 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.2 U	0.2 U	<b>0.48</b>	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.19 U	0.2 U	0.2 U	<b>0.28</b>	0.19 U	0.19 U	<b>0.68</b>	0.19 U	0.19 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.12 U	0.13 U	0.13 U	0.13 U	0.12 U	0.12 U	0.13 U	0.12 U	0.12 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.18 U	0.17 U	0.18 U	0.18 U	0.17 U	0.17 U	0.17 U	0.19 U	0.17 U	0.17 U	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	<b>0.26</b>	0.19 U	0.19 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.17 U	0.16 U	0.17 U	0.17 U	0.16 U	0.16 U	0.16 U	0.18 U	0.16 U	0.16 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.2 U	0.19 U	0.2 U	<b>0.2</b>	0.19 U	0.19 U	0.19 U	<b>0.26</b>	0.19 U	0.19 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	0.2 U	0.19 U	0.2 U	0.2 U	<b>6.1</b>	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	<b>0.55</b>
FLUORENE	UG/L	280	1,400	0.2 U	0.19 U	0.2 U	0.2 U	<b>3.7</b>	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.19 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	<b>0.24</b>	0.19 U	0.19 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.2 U	0.19 U	0.2 U	0.2 U	<b>0.35</b>	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.19 U
PHENANTHRENE	UG/L	210	1,050	<b>0.24</b>	0.19 U	<b>0.27</b>	<b>0.25</b>	<b>0.25</b>	0.19 U	<b>0.26</b>	0.21 U	0.19 U	<b>0.23</b>	<b>0.28</b>
PYRENE	UG/L	210	1,050	0.2 U	0.19 U	0.2 U	0.2 U	<b>2.3</b>	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	<b>0.3</b>
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	<b>0.011 B</b>	0.01 U	0.01 U	0.01 U	0.01 U	<b>0.02 B</b>	0.01 U	<b>0.013 B</b>

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

EB - Equipment blank

TB - Trip blank

Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-3 (Continued)**  
**Analytical Summary**  
**First Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-031A 2/15/2010	OW-033E 2/17/2010	OW-035B 2/17/2010	OW-035C 2/17/2010	OW-035DR 2/15/2010	OW-035E 2/17/2010	OW-036B 2/16/2010	OW-037B 2/16/2010	OW-037D 2/15/2010	OW-037D DUP	OW-039BR2 2/18/2010
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	<b>22</b>	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	<b>20</b>	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	<b>10.2</b>	5 U	5 U	5 U	5 U	<b>12.3</b>	5 U	5 U	5 U	<b>7.9</b>
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U				
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U				
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	0.99 U	0.95 U	0.95 U	1 U	0.98 U	1 U	0.94 U	0.99 U	0.96 U	0.94 U	0.96 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.12 U	0.12 U	0.14 U	0.13 U	0.13 U	0.12 U	0.13 U	0.12 U	0.12 U	0.12 U
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.18 U	0.17 U	0.17 U	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.17 U	0.16 U	0.16 U	0.18 U	0.17 U	0.17 U	0.16 U	0.17 U	0.16 U	0.16 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	<b>0.24 B</b>	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	<b>0.24</b>	<b>0.45</b>	<b>0.67</b>	<b>0.88</b>	0.19 U
FLUORENE	UG/L	280	1,400	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	<b>0.32</b>	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
PHENANTHRENE	UG/L	210	1,050	<b>0.26</b>	<b>0.31</b>	0.19 U	<b>0.23</b>	<b>0.25</b>	<b>0.28</b>	<b>0.25</b>	<b>0.33</b>	<b>0.43</b>	<b>0.51</b>	0.19 U
PYRENE	UG/L	210	1,050	0.2 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	<b>0.22</b>	<b>0.37</b>	<b>0.48</b>	0.19 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.01 U	<b>0.014 B</b>	0.01 U	<b>0.015 B</b>	0.01 U	<b>0.17</b>	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

EB - Equipment blank

TB - Trip blank

Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-3 (Continued)**  
**Analytical Summary**  
**First Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-039DR 2/15/2010	OW-039DR DUP	OW-039ER 2/17/2010	OW-040B 2/15/2010	OW-040D 2/16/2010	OW-040D DUP	OW-041A 2/16/2010	OW-041B 2/17/2010	OW-041D 2/16/2010	OW-042B 2/16/2010	OW-044D 2/17/2010
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	19.1	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	24.5	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	5 U	5 U	5 U	5 U	11	6.4	5 U	5 U	7.2
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	0.97 U	0.94 U	0.94 U	0.94 U	0.95 U	0.99 U	1.1 U	0.97 U	0.97 U	0.96 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.12 U	0.12 U	0.12 U	0.12 U	0.13 U	0.14 U	0.13 U	0.13 U	0.12 U	0.14 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.19 U	0.17 U	0.17 U	0.17 U	0.19 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.18 U	0.16 U	0.16 U	0.16 U	0.18 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
FLUORENE	UG/L	280	1,400	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
NAPHTHALENE	UG/L	140	220	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.3
PHENANTHRENE	UG/L	210	1,050	0.2	0.24	0.2	0.19 U	0.26	0.23	0.22 U	0.24	0.19 U	0.19 U	0.52
PYRENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.22 U	0.19 U	0.19 U	0.19 U	0.21 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.01 U	0.049 B	0.012 B	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012	0.015 B

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

EB - Equipment blank

TB - Trip blank

Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-3 (Continued)**  
**Analytical Summary**  
**First Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-044D DUP	OW-102B 2/16/2010	OW-102D 2/15/2010	OW-102E 2/16/2010	OW-200E 2/15/2010	OW-201E 2/18/2010	OW-201E DUP	OW-202A 2/15/2010	OW-202B 2/17/2010	OW-202D 2/17/2010	OW-203A 2/16/2010
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	16.8	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	15.1	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.4
CHROMIUM - TOTAL	UG/L	--	--	6.6	5 U	5 U	5 U	5 U	5 U	5 U	5 U	11.9	5 U	568
COPPER - SOLUBLE	UG/L	650	650	25 U	95.5	25 U	25 U	25 U	25 U	25 U	25 U	237	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	117	25 U	25 U	25 U	25 U	25 U	25 U	938	25 U	25 U
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	0.97 U	0.94 U	0.94 U	1 U	1 U	1 U	0.94 U	0.95 U	0.95 U	0.94 U	1.1 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.21 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.21 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.39	0.19 U	0.19 U	0.19 U	0.21 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.12 U	0.12 U	0.26	0.13 U	0.13 U	3.3	0.12 U	0.12 U	0.12 U	0.14 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	2.2	0.19 U	0.19 U	0.19 U	0.21 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.17 U	0.17 U	0.19	0.18 U	0.18 U	3.3	0.17 U	0.17 U	0.17 U	0.19 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	3	0.19 U	0.19 U	0.19 U	0.21 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	0.16 U	0.2	0.17 U	0.17 U	2.5	0.16 U	0.16 U	0.16 U	0.18 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	0.19 U	0.23	0.2 U	0.2 U	3	0.19 U	0.19 U	0.19 U	0.21 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.19 U	0.23	0.2 U	0.2 U	3.1	0.19 U	0.19 U	0.19 U	0.21 U
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	1.3	0.19 U	0.19 U	0.19 U	0.21 U
FLUORENE	UG/L	280	1,400	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.21 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	3	0.19 U	0.19 U	0.19 U	0.21 U
NAPHTHALENE	UG/L	140	220	0.35	0.19 U	0.19 U	0.21 U	0.23	0.46	0.19 U	0.19 U	0.19 U	0.19 U	0.21 U
PHENANTHRENE	UG/L	210	1,050	0.64	0.42	0.19 U	0.24	0.2 U	0.2 U	0.32	0.19 U	0.44	0.3	0.21 U
PYRENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	0.2 U	1.1	0.19 U	0.19 U	0.19 U	0.21 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.013 B	0.011	0.01 U	0.011	0.01 U	0.029 JB	0.14 J	0.01 U	0.011 B	0.01 U	0.01 U

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

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Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach) to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-3 (Continued)**  
**Analytical Summary**  
**First Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-204A 2/17/2010	OW-204B 2/16/2010	OW-205A 2/18/2010	OW-206A 2/16/2010	OW-207A 2/16/2010	R-013A 2/15/2010	R-014C 2/17/2010	R-014D 2/16/2010	R-014E 2/17/2010
<b>Metals (Method 6010B)</b>												
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	<b>10.3</b>	10 U	10 U	10 U	<b>12.5</b>	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	<b>12.8</b>	10 U	10 U				
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	<b>32.7</b>	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	<b>154</b>	<b>34.6</b>	5 U	<b>7.5</b>	<b>10.5</b>	5 U	5 U	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U				
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U				
<b>BTEX (Method 8021B)</b>												
BENZENE	UG/L	5	25	1 U	1 U	<b>9.1</b>	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	<b>26</b>	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	<b>3.1</b>	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	<b>10</b>	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>												
PENTACHLOROPHENOL	UG/L	1	5	1.1 U	1 U	0.94 U	1.1 U	0.98 U	1 U	1.1 U	0.97 U	1 U
<b>SVOCs (Method 8270C SIM)</b>												
ACENAPHTHENE	UG/L	420	2,100	<b>0.63</b>	0.21 U	<b>45</b>	0.22 U	0.2 U	0.21 U	0.21 U	0.19 U	0.2 U
ACENAPHTHYLENE	UG/L	210	1,050	0.22 U	0.21 U	<b>0.74</b>	0.22 U	0.2 U	0.21 U	0.21 U	0.19 U	0.2 U
ANTHRACENE	UG/L	2,100	10,500	0.22 U	0.21 U	<b>2.4</b>	0.22 U	0.2 U	0.21 U	0.21 U	0.19 U	0.2 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	<b>0.23</b>	0.14 U	0.12 U	0.14 U	0.13 U	0.13 U	<b>1.4</b>	0.13 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.22 U	0.21 U	0.19 U	0.22 U	0.2 U	0.21 U	<b>1.1</b>	0.19 U	0.2 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.2 U	0.19 U	0.17 U	0.19 U	0.18 U	0.19 U	<b>1.6</b>	0.17 U	0.18 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.22 U	0.21 U	0.19 U	0.22 U	0.2 U	0.21 U	<b>1.6</b>	0.19 U	0.2 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.19 U	0.18 U	0.16 U	0.18 U	0.17 U	0.18 U	<b>1.3</b>	0.16 U	0.17 U
CHRYSENE	UG/L	1.5	7.5	0.22 U	0.21 U	0.19 U	0.22 U	0.2 U	0.21 U	<b>1.4</b>	0.19 U	0.2 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.22 U	0.21 U	0.19 U	0.22 U	0.2 U	0.21 U	<b>1.5</b>	0.19 U	0.2 U
FLUORANTHENE	UG/L	280	1,400	<b>0.97</b>	0.21 U	<b>1.9</b>	0.22 U	0.2 U	0.21 U	<b>0.4</b>	0.19 U	0.2 U
FLUORENE	UG/L	280	1,400	<b>0.36</b>	0.21 U	<b>14</b>	0.22 U	0.2 U	0.21 U	0.21 U	0.19 U	<b>0.2</b>
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.22 U	0.21 U	0.19 U	0.22 U	0.2 U	0.21 U	<b>1.5</b>	0.19 U	0.2 U
NAPHTHALENE	UG/L	140	220	0.22 U	0.21 U	<b>1100</b>	0.22 U	0.2 U	0.21 U	0.21 U	0.19 U	<b>0.4</b>
PHENANTHRENE	UG/L	210	1,050	<b>0.83</b>	0.21 U	<b>17</b>	0.22 U	0.2 U	<b>0.42</b>	0.21 U	0.19 U	<b>0.34</b>
PYRENE	UG/L	210	1,050	<b>0.49</b>	0.21 U	<b>0.76</b>	0.22 U	0.2 U	0.21 U	<b>0.35</b>	0.19 U	0.2 U
<b>Phenolics (Method 9066)</b>												
PHENOLICS	MG/L	--	--	<b>0.011 B</b>	0.01 U	<b>0.013 B</b>	0.01 U	0.01 U	0.01 U	<b>0.012 B</b>	<b>0.011</b>	0.01 U

**Notes:**

- BTEX - benzene, toluene, ethylbenzene, xylenes
- SVOCs - semivolatile organic compounds
- U - compound was analyzed but not detected
- J - an estimated result
- DUP - Duplicate sample
- B - field blank contamination
- EB - Equipment blank
- TB - Trip blank
- Bold - constituent detected
- Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-3 (Continued)**  
**Analytical Summary**  
**First Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	BOTTLE BLANK 2/15/2010	EB 2/15/2010	EB-1175 2/15/2010	EB-1176 2/15/2010	EB-1415 2/15/2010	EB 2/16/2010	EB 2/17/2010	EB 2/18/2010	TB 2/15/2010	TB 2/16/2010	TB 2/17/2010	TB 2/18/2010
<b>Metals (Method 6010B)</b>															
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA	NA
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA	NA
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	NA	NA	NA	NA
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	NA	NA	NA	NA
<b>BTEX (Method 8021B)</b>															
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>															
PENTACHLOROPHENOL	UG/L	1	5	0.95 U	1.1 U	1 U	0.95 U	0.94 U	0.96 U	1.1 U	1 U	NA	NA	NA	NA
<b>SVOCs (Method 8270C SIM)</b>															
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.12 U	0.14 U	0.13 U	0.12 U	0.12 U	0.12 U	0.14 U	0.13 U	NA	NA	NA	NA
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.19 U	0.18 U	<b>0.18</b>	0.17 U	0.17 U	0.19 U	0.18 U	NA	NA	NA	NA
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.22 U	0.2 U	<b>0.19</b>	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.18 U	0.17 U	<b>0.27</b>	<b>0.17</b>	0.16 U	0.18 U	0.17 U	NA	NA	NA	NA
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.22 U	0.2 U	<b>0.19</b>	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.22 U	0.2 U	<b>0.37</b>	<b>0.22</b>	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
FLUORENE	UG/L	280	1,400	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.22 U	0.2 U	<b>0.31</b>	<b>0.21</b>	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
NAPHTHALENE	UG/L	140	220	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
PYRENE	UG/L	210	1,050	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U	0.19 U	0.21 U	0.2 U	NA	NA	NA	NA
<b>Phenolics (Method 9066)</b>															
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	<b>0.01</b>	0.01 U	0.01 U	0.01 U	<b>0.014</b>	<b>0.013</b>	NA	NA	NA	NA

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

EB - Equipment blank

TB - Trip blank

Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach) to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-4**  
**Analytical Summary**  
**Second Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-010B 8/3/2010	OW-012D 8/2/2010	OW-017A 8/4/2010	OW-017C 8/4/2010	OW-022BR 8/5/2010	OW-023C 8/3/2010	OW-023D 8/3/2010	OW-026A 8/5/2010	OW-026A DUP	OW-027A 8/3/2010	OW-027D 8/3/2010
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	11.6	10 U	10 U	10 U	281	280	25.2	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	14.9	10 U	10 U	10 U	275	279	26.6	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	103	5 U	5 U	22.2	92	13.9	5 U	5 U	5 U	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U				
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U				
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	0.99 U	0.95 U	1 U	1 U	1.1 U	0.96 U	1.1 U	0.95 U	1 U	1.2 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	2.4	2	0.24 U	0.21 U
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	0.19 U	0.21 U	0.24 U	0.21 U
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	1.4	1.4	0.24 U	0.21 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.12 B	0.13 U	0.13 U	0.14 U	0.12 U	0.14 U	0.12 U	0.13 U	0.16 U	0.14 U
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	0.19 U	0.21 U	0.24 U	0.21 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.18 U	0.17 U	0.18 U	0.19 U	0.2 U	0.17 U	0.19 U	0.17 U	0.19 U	0.22 U	0.19 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	0.19 U	0.21 U	0.24 U	0.21 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.17 U	0.16 U	0.17 U	0.18 U	0.19 U	0.16 U	0.18 U	0.16 U	0.18 U	0.2 U	0.18 U
CHRYSENE	UG/L	1.5	7.5	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	0.19 U	0.21 U	0.24 U	0.21 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	0.19 U	0.21 U	0.24 U	0.21 U
FLUORANTHENE	UG/L	280	1,400	0.2 U	0.19 B	0.2 U	0.21 U	0.22 U	0.24	0.21 U	0.19 U	0.21 U	0.24 U	0.21 U
FLUORENE	UG/L	280	1,400	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	0.23	0.21 U	0.24 U	0.21 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	0.19 U	0.21 U	0.24 U	0.21 U
NAPHTHALENE	UG/L	140	220	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	1.7 J	0.32 J	0.24 U	0.21 U
PHENANTHRENE	UG/L	210	1,050	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.27	0.21 U	0.32	0.21 U	0.24 U	0.21 U
PYRENE	UG/L	210	1,050	0.2 U	0.19 U	0.2 U	0.21 U	0.22 U	0.19 U	0.21 U	0.19 U	0.21 U	0.24 U	0.21 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	0.016 JB	0.024 JB	0.018 B	0.01 U				

**Notes:**

- BTEX - benzene, toluene, ethylbenzene, xylenes
- SVOCs - semivolatile organic compounds
- U - compound was analyzed but not detected
- J - an estimated result
- DUP - Duplicate sample
- B - field blank contamination
- EB - Equipment blank
- PB - Pump blank
- TB - Trip blank
- Bold - constituent detected
- Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-4 (Continued)**  
**Analytical Summary**  
**Second Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-027D DUP	OW-027E 8/4/2010	OW-031A 8/4/2010	OW-033E 8/4/2010	OW-035B 8/2/2010	OW-035C 8/3/2010	OW-035DR 8/3/2010	OW-035E 8/4/2010	OW-036B 8/4/2010	OW-037B 8/4/2010	OW-037D 8/5/2010
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	17.6	10 U	10 U	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	14.4	10 U	10 U	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	5 U	13.1	5 U	5 U	5 U	7.1	5 U	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	1 U	0.96 U	1.1 U	1 U	0.94 U	1 U	0.96 U	0.96 U	1 U	0.96 U	0.99 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.19 U	0.22 U	0.21 U	0.19 U	0.2 U	0.19 U	0.32	0.2 U	0.19 U	0.2 U
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.22 U	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.19 U	0.22 U	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.12 U	0.15 U	0.38	0.12 U	0.13 U	0.12 U	0.12 U	0.13 U	0.12 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	0.19 U	0.22 U	0.27	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.18 U	0.17 U	0.2 U	0.38	0.17 U	0.18 U	0.17 U	0.17 U	0.18 U	0.17 U	0.18 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.22 U	0.38	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.17 U	0.16 U	0.19 U	0.37	0.16 U	0.17 U	0.16 U	0.16 U	0.17 U	0.16 U	0.17 U
CHRYSENE	UG/L	1.5	7.5	0.2 U	0.19 U	0.22 U	0.42	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.2 U	0.19 U	0.22 U	0.37	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U
FLUORANTHENE	UG/L	280	1,400	0.2 U	0.19 U	0.22 U	0.21 U	0.3 B	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U
FLUORENE	UG/L	280	1,400	0.2 U	0.19 U	0.22 U	0.21 U	0.19 U	0.2 U	0.19 U	0.21	0.2 U	0.19 U	0.2 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.2 U	0.19 U	0.22 U	0.38	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U
NAPHTHALENE	UG/L	140	220	0.2 U	0.19 U	0.22 U	0.21 U	0.19 U	0.2 U	0.19 U	0.46	0.2 U	0.19 U	0.2 U
PHENANTHRENE	UG/L	210	1,050	0.2 U	0.19 U	0.22 U	0.21 U	0.19 U	0.2 U	0.25	0.4	0.25	0.19 U	0.26
PYRENE	UG/L	210	1,050	0.2 U	0.19 U	0.22 U	0.21 U	0.26 B	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.01 U	0.018	0.01 U	0.01 U	0.01 U	0.01 U	0.014 B	0.16	0.01 U	0.01 U	0.02 B

**Notes:**

- BTEX - benzene, toluene, ethylbenzene, xylenes
- SVOCs - semivolatile organic compounds
- U - compound was analyzed but not detected
- J - an estimated result
- DUP - Duplicate sample
- B - field blank contamination
- EB - Equipment blank
- PB - Pump blank
- TB - Trip blank
- Bold - constituent detected
- Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-4 (Continued)**  
**Analytical Summary**  
**Second Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-039BR2 8/2/2010	OW-039DR 8/3/2010	OW-039ER 8/3/2010	OW-040B 8/2/2010	OW-040D 8/3/2010	OW-040D DUP	OW-041A 8/3/2010	OW-041B 8/3/2010	OW-041D 8/2/2010	OW-042B 8/2/2010	OW-042B DUP
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	28.4	15.7	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	42.2	14.9	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	0.94 U	1 U	0.95 U	1 U	0.94 U	0.96 U	0.99 U	0.95 U	0.98 U	0.97 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.27 B	0.13 U	0.12 U	0.13 U	0.12 U	0.12 U	0.13 U	0.12 U	0.13 U	0.13 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.27 B	0.18 U	0.17 U	0.18 U	0.17 U	0.17 U	0.18 U	0.17 U	0.18 U	0.17 U	0.18 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.29 B	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.27 B	0.17 U	0.16 U	0.17 U	0.16 U	0.16 U	0.17 U	0.16 U	0.17 U	0.16 U	0.17 U
CHRYSENE	UG/L	1.5	7.5	0.31 B	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.27 B	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
FLUORANTHENE	UG/L	280	1,400	0.2 B	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
FLUORENE	UG/L	280	1,400	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.29 B	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
NAPHTHALENE	UG/L	140	220	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.24	0.2 B	0.19 U	0.2 U
PYRENE	UG/L	210	1,050	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

**Notes:**

- BTEX - benzene, toluene, ethylbenzene, xylenes
- SVOCs - semivolatile organic compounds
- U - compound was analyzed but not detected
- J - an estimated result
- DUP - Duplicate sample
- B - field blank contamination
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- Bold - constituent detected
- Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-4 (Continued)**  
**Analytical Summary**  
**Second Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-044D 8/4/2010	OW-044D DUP	OW-102B 8/4/2010	OW-102D 8/2/2010	OW-102E 8/5/2010	OW-200E 8/3/2010	OW-201E 8/4/2010	OW-202A 8/2/2010	OW-202B 8/4/2010	OW-202D 8/3/2010	OW-203A 8/3/2010
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	22.7	5 U	5 U	5 U	5 U	5 U	5 U	5 U	13.7
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	0.96 U	0.96 U	1 U	0.95 U	0.94 U	1 U	0.95 U	0.97 U	1 U	0.94 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.12 U	0.12 U	0.13 U	0.12 U	0.12 U	0.14 U	0.12 U	0.13 U	0.13 U	0.12 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.17 U	0.19 U	0.17 U	0.17 U	0.19 U	0.17 U	0.17 U	0.19 U	0.17 U	0.19 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	0.18 U	0.16 U	0.16 U	0.18 U	0.16 U	0.16 U	0.18 U	0.16 U	0.18 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
FLUORENE	UG/L	280	1,400	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
NAPHTHALENE	UG/L	140	220	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.55	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.2	0.25	0.19 U	0.19 U	0.42	0.19 U	0.22 B	0.21 U	0.19	0.21 U
PYRENE	UG/L	210	1,050	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.21 U	0.19 U	0.21 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 B	0.01 U				

**Notes:**

- BTEX - benzene, toluene, ethylbenzene, xylenes
- SVOCs - semivolatile organic compounds
- U - compound was analyzed but not detected
- J - an estimated result
- DUP - Duplicate sample
- B - field blank contamination
- EB - Equipment blank
- PB - Pump blank
- TB - Trip blank
- Bold - constituent detected
- Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-4 (Continued)**  
**Analytical Summary**  
**Second Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-204A 8/4/2010	OW-204B 8/3/2010	OW-205A 8/5/2010	OW-206A 8/2/2010	OW-207A 8/2/2010	R-013A 8/4/2010	R-014C 8/5/2010	R-014D 8/2/2010	R-014E 8/4/2010
<b>Metals (Method 6010B)</b>												
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	13.8	10 U	10 U				
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	15.9	10 U	10 U				
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	24.5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	39.1	23.4	5 U	22.5	21.6	5 U	5 U	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U				
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U				
<b>BTEX (Method 8021B)</b>												
BENZENE	UG/L	5	25	1 U	1 U	3.7	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	17	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1.9	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	9	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>												
PENTACHLOROPHENOL	UG/L	1	5	1 U	0.95 U	1 U	0.94 U	0.99 U	0.95 U	0.94 U	0.94 U	1 U
<b>SVOCs (Method 8270C SIM)</b>												
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.19 U	110	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.19 U	1.2	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.19 U	5.7	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.12 U	0.13 U	0.12 U	0.13 U	0.12 U	0.12 U	0.12 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	0.19 U	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.18 U	0.17 U	0.19 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.18 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.17 U	0.16 U	0.18 U	0.16 U	0.17 U	0.16 U	0.16 U	0.16 U	0.17 U
CHRYSENE	UG/L	1.5	7.5	0.2 U	0.19 U	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.2 U	0.19 U	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U
FLUORANTHENE	UG/L	280	1,400	0.27	0.19 U	5.5	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U
FLUORENE	UG/L	280	1,400	0.2 U	0.19 U	63	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.23
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.2 U	0.19 U	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U
NAPHTHALENE	UG/L	140	220	0.2 U	0.19 U	2300	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.41
PHENANTHRENE	UG/L	210	1,050	0.23	0.19 U	84	0.19 U	0.2 U	0.19 U	0.23	0.21 B	0.42
PYRENE	UG/L	210	1,050	0.2 U	0.19 U	2.2	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U
<b>Phenolics (Method 9066)</b>												
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.027 B	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

**Notes:**

- BTEX - benzene, toluene, ethylbenzene, xylenes
- SVOCs - semivolatile organic compounds
- U - compound was analyzed but not detected
- J - an estimated result
- DUP - Duplicate sample
- B - field blank contamination
- EB - Equipment blank
- PB - Pump blank
- TB - Trip blank
- Bold - constituent detected
- Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**Table A-4 (Continued)**  
**Analytical Summary**  
**Second Semi-Annual 2010 RCRA Groundwater Data**  
**2010 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	BOTTLE BLANK 8/2/2010	EB 8/2/2010	EB 8/3/2010	EB 8/4/2010	EB 8/5/2010	PB-1079 8/2/2010	PB-1175 8/2/2010	PB-1176 8/2/2010	TB 8/2/2010	TB 8/3/2010	TB 8/4/2010	TB 8/5/2010
<b>Metals (Method 6010B)</b>															
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA	NA
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA	NA
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	NA	NA	NA	NA
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	NA	NA	NA	NA
<b>BTEX (Method 8021B)</b>															
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>															
PENTACHLOROPHENOL	UG/L	1	5	0.97 U	1 U	1.1 U	1 U	1 U	0.96 U	1 U	0.97 U	NA	NA	NA	NA
<b>SVOCs (Method 8270C SIM)</b>															
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.21 U	0.22 U	0.2 U	0.21 U	0.19 U	0.2 U	0.19 U	NA	NA	NA	NA
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.21 U	0.22 U	0.2 U	0.21 U	0.19 U	0.2 U	0.19 U	NA	NA	NA	NA
ANTHRACENE	UG/L	2,100	10,500	0.19 U	<b>0.3</b>	0.22 U	0.2 U	0.21 U	0.19 U	<b>0.27</b>	0.19 U	NA	NA	NA	NA
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	<b>1.9</b>	0.14 U	0.13 U	0.13 U	0.12 U	<b>1.9</b>	0.13 U	NA	NA	NA	NA
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	<b>1.3</b>	0.22 U	0.2 U	0.21 U	0.19 U	<b>1.3</b>	0.19 U	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	<b>1.8</b>	0.19 U	0.18 U	0.19 U	0.17 U	<b>1.9</b>	0.17 U	NA	NA	NA	NA
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	<b>1.9</b>	0.22 U	0.2 U	0.21 U	0.19 U	<b>2</b>	0.19 U	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	<b>1.7</b>	0.18 U	0.17 U	0.18 U	0.16 U	<b>1.6</b>	0.16 U	NA	NA	NA	NA
CHRYSENE	UG/L	1.5	7.5	0.19 U	<b>1.9</b>	0.22 U	0.2 U	0.21 U	0.19 U	<b>1.9</b>	0.19 U	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	<b>1.7</b>	0.22 U	0.2 U	0.21 U	0.19 U	<b>1.7</b>	0.19 U	NA	NA	NA	NA
FLUORANTHENE	UG/L	280	1,400	0.19 U	<b>0.97</b>	0.22 U	0.2 U	0.21 U	0.19 U	<b>0.95</b>	0.19 U	NA	NA	NA	NA
FLUORENE	UG/L	280	1,400	0.19 U	0.21 U	0.22 U	0.2 U	0.21 U	0.19 U	0.2 U	0.19 U	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	<b>1.8</b>	0.22 U	0.2 U	0.21 U	0.19 U	<b>1.9</b>	0.19 U	NA	NA	NA	NA
NAPHTHALENE	UG/L	140	220	0.19 U	0.21 U	0.22 U	0.2 U	0.21 U	0.19 U	0.2 U	0.19 U	NA	NA	NA	NA
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.21 U	0.22 U	0.2 U	0.21 U	0.19 U	<b>0.33</b>	0.19 U	NA	NA	NA	NA
PYRENE	UG/L	210	1,050	0.19 U	<b>0.91</b>	0.22 U	0.2 U	0.21 U	0.19 U	<b>0.9</b>	0.19 U	NA	NA	NA	NA
<b>Phenolics (Method 9066)</b>															
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	<b>0.03</b>	0.01 U	<b>0.017</b>	0.01 U	0.01 U	0.01 U	NA	NA	NA	NA

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatiles organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

EB - Equipment blank

PB - Pump blank

TB - Trip blank

Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**APPENDIX B**  
**DATA EVALUATION REPORTS FOR 2010**

# FTS, LLC

DATE: March 18, 2010

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C0B160438

SAMPLES: PB-1175-021510, EB-1176-021510, EB-1415-021510, BOTTLE BLANK-021510, OW-202A, OW-012D, OW-40B, OW-102D, OW-035DR, OW-017A, OW-031A, OW-039DR, OW-99B-021510(OW-039DR), R-013A, OW-200E, OW-037D, OW-027E, OW-99A-021510(OW-037D), EB-021510, TRIP BLANK

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- Data Completeness  
Noncompliances: None
- Holding Times  
Noncompliances: None
- Laboratory Blank Contamination  
Noncompliances: None
- Field Blank Contamination  
**Noncompliances: Benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, dibenzo(ah)anthracene, indeno(1,2,3-cd)pyrene, and total recoverable phenolics were detected in the equipment blanks. See attached page for details.**
- Field Duplicate Precision:  
Noncompliances: See attached page for details.
- Surrogate Recoveries  
Noncompliances: None
- Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MS/MSD recoveries of benzo(k)fluoranthene, benzo(ghi)perylene, and benzo(a)pyrene fell below the control limits. No action was taken as the LCS recoveries were compliant.
- Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analytes were detected in the aqueous equipment blank, EB-1176-021510, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Benzo(b)fluoranthene	0.18 ug/l	0.9 ug/l
Benzo(ghi)perylene	0.19 ug/l	0.95 ug/l
Benzo(k)fluoranthene	0.27 ug/l	1.35 ug/l
Chrysene	0.19 ug/l	0.95 ug/l
Dibenzo(ah)anthracene	0.37 ug/l	1.85 ug/l
Indeno(1,2,3-cd)pyrene	0.31 ug/l	1.55 ug/l

The following analytes were detected in the aqueous equipment blank, EB-1415-021510, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Benzo(k)fluoranthene	0.17 ug/l	0.85 ug/l
Dibenzo(ah)anthracene	0.22 ug/l	1.1 ug/l
Indeno(1,2,3-cd)pyrene	0.21 ug/l	1.05 ug/l

The following analyte was detected in the aqueous equipment blank, PB-1175-021510, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Total Recoverable Phenolics	0.01 mg/l	0.05 mg/l

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B" for field blank contamination.

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-037D	QUAL	OW-99A	QUAL	RPD
Fluoranthene	0.67		0.88		27.10
Phenanthrene	0.43		0.51		17.02
Pyrene	0.37		0.48		25.88
ANALYTE	OW-039DR	QUAL	OW-99B	QUAL	RPD
Phenanthrene	0.2		0.24		18.18
Total Recoverable Phenolics	0.01	U	0.049	B	NC

NC – not calculated due to nondetect result

# FTS, LLC

**DATE:** March 18, 2010

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C0B170459

**SAMPLES:** OW-042B, OW-102B, OW-023C, OW-023D, R-014D, OW-102E, OW-037B, OW-036B, OW-040D, OW-041D, OW-207A, OW-041A, OW-206A, OW-204B, OW-203A, OW-99C-021610(OW-040D), EB-021610, TRIP BLANK

**ANALYSES:** Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- Data Completeness  
Noncompliances: None
- Holding Times  
Noncompliances: None
- Laboratory Blank Contamination  
Noncompliances: None
- Field Blank Contamination  
Noncompliances: None
- Field Duplicate Precision:  
Noncompliances: See attached page for details.
- Surrogate Recoveries  
Noncompliances: None
- Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MS/MSD recoveries of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, and benzo(a)pyrene fell below the control limits. The RPD of benzo(a)anthracene was above the control limits. No action was taken as the LCS recoveries were compliant.
- Laboratory Control Sample  
Noncompliances: None

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-040D	QUAL	OW-99C	QUAL	RPD
Phenanthrene	0.26		0.23		12.24

# FTS, LLC

DATE: March 18, 2010

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C0B180496

SAMPLES: OW-202B, OW-027D, OW-010B, OW-041B, OW-202D, R-014C, OW-044D, OW-035C, OW-033E, OW-039ER, OW-017C, OW-204A, OW-035B, R-014E, OW-035E, OW-99D-021710(OW-044D), EB-021710, TRIP BLANK

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- Data Completeness  
Noncompliances: None
- Holding Times  
Noncompliances: None
- Laboratory Blank Contamination  
Noncompliances: None
- Field Blank Contamination  
**Noncompliances: Total recoverable phenolics was detected in the equipment blank. See attached page for details.**
- Field Duplicate Precision:  
Noncompliances: See attached page for details.
- Surrogate Recoveries  
Noncompliances: None
- Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MS/MSD recoveries of benzo(b)fluoranthene and benzo(k)fluoranthene fell below the control limits. The RPD's of phenanthrene and pyrene were above the control limits. No action was taken as the LCS recoveries were compliant.
- Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analyte was detected in the aqueous equipment blank, EB-021710, at the following concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Total Recoverable Phenolics	0.014 mg/l	0.07 mg/l

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B" for field blank contamination.

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-044D	QUAL	OW-99D	QUAL	RPD
Chromium, total	7.2		6.6		8.70
Naphthalene	0.3		0.35		15.38
Phenanthrene	0.52		0.64		20.69
Total Recoverable Phenolics	0.015	B	0.013	B	14.29

## FTS, LLC

**DATE:** March 18, 2010

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C0B190440

**SAMPLES:** OW-039BR2, OW-205A, OW-201E, OW-022BR, OW-026A, OW-027A, OW-99E-021510(OW-201E), EB-021810, TRIP BLANK

**ANALYSES:** Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- Data Completeness  
Noncompliances: None
- Holding Times  
Noncompliances: None
- Laboratory Blank Contamination  
Noncompliances: None
- Field Blank Contamination  
**Noncompliances: Total recoverable phenolics was detected in the equipment blank. See attached page for details.**
- Field Duplicate Precision:  
Noncompliances: See attached page for details.
- Surrogate Recoveries  
Noncompliances: None
- Matrix Spike and Matrix Spike Duplicate  
Noncompliances: None
- Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analyte was detected in the aqueous equipment blank, EB-021810, at the following concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Total Recoverable Phenolics	0.013 mg/l	0.065 mg/l

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B" for field blank contamination.

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-201E	QUAL	OW-99E	QUAL	RPD
Anthracene	0.2	U	0.39		NC
Benzo(a)anthracene	0.13	U	3.3		NC
Benzo(a)pyrene	0.2	U	2.2		NC
Benzo(b)fluoranthene	0.18	U	3.3		NC
Benzo(ghi)perylene	0.2	U	3		NC
Benzo(k)fluoranthene	0.17	U	2.5		NC
Chrysene	0.2	U	3		NC
Dibenzo(ah)anthracene	0.2	U	3.1		NC
Fluoranthene	0.2	U	1.3		NC
Indeno(1,2,3-cd)pyrene	0.2	U	3		NC
Naphthalene	0.46		0.19	U	NC
Phenanthrene	0.2	U	0.32		NC
Pyrene	0.2	U	1.1		NC
Total Recoverable Phenolics	0.029		0.14		131.36*

NC – not calculated due to nondetect result

\* - RPD is greater than 30%, the associated samples are qualified as estimated, "J," due to laboratory or field sampling imprecision

# FTS, LLC

**DATE:** August 27, 2010

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C0H030488

**SAMPLES:** R-14D, OW-41D, OW-35B, OW-206A, OW-39BR2, OW-202A, OW-012D, OW-040B, OW-102D, EB-1079, OW-042B, OW-99A(OW-042B), OW-207A, BB-080210, PB-1176, PB-1175, PB-1079, TRIP BLANK

**ANALYSES:** Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- Data Completeness  
Noncompliances: None
- Holding Times  
Noncompliances: None
- Laboratory Blank Contamination  
Noncompliances: None
- Field Blank Contamination  
**Noncompliances: Several analytes were detected in the equipment blank and a pump blank. See attached page for details.**
- Field Duplicate Precision:  
Noncompliances: None
- Surrogate Recoveries  
Noncompliances: None
- Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MS/MSD recovery of total recoverable phenolics was above the control limits. No action was taken as the LCS recoveries were compliant.
- Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analytes were detected in the aqueous equipment blank, EB-1079, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Anthracene	0.3 ug/l	1.5 ug/l
Benzo(a)anthracene	1.9 ug/l	9.5 ug/l
Benzo(a)pyrene	1.3 ug/l	6.5 ug/l
Benzo(b)fluoranthene	1.8 ug/l	9 ug/l
Benzo(g,h,i)perylene	1.9 ug/l	9.5 ug/l
Benzo(k)fluoranthene	1.7 ug/l	8.5 ug/l
Chrysene	1.9 ug/l	9.5 ug/l
Dibenzo(a,h)anthracene	1.7 ug/l	8.5 ug/l
Fluoranthene	0.97 ug/l	4.85 ug/l
Indeno(1,2,3-cd)pyrene	1.8 ug/l	9 ug/l
Pyrene	0.91 ug/l	4.55 ug/l

The following analytes were detected in the aqueous pump blank, PB-1175, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Anthracene	0.27 ug/l	1.35 ug/l
Benzo(a)anthracene	1.9 ug/l	9.5 ug/l
Benzo(a)pyrene	1.3 ug/l	6.5 ug/l
Benzo(b)fluoranthene	1.9 ug/l	9.5 ug/l
Benzo(g,h,i)perylene	2 ug/l	10 ug/l
Benzo(k)fluoranthene	1.6 ug/l	8 ug/l
Chrysene	1.9 ug/l	9.5 ug/l
Dibenzo(a,h)anthracene	1.7 ug/l	8.5 ug/l
Fluoranthene	0.95 ug/l	4.75 ug/l
Indeno(1,2,3-cd)pyrene	1.9 ug/l	9.5 ug/l
Phenanthrene	0.33 ug/l	1.65 ug/l
Pyrene	0.9 ug/l	4.5 ug/l

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B" for field blank contamination.

# FTS, LLC

**DATE:** August 27, 2010

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C0H040592

**SAMPLES:** OW-10B, OW-35DR, OW-40D, OW-202D, OW-99B(OW-27D), OW-99C(OW-40D), OW-41A, OW-27A, OW-204B, OW-23C, OW-203A, OW-39DR, OW-39ER, OW-200E, OW-35C, EB1176, OW-27D, OW-41B, OW-23D, TRIP BLANK

**ANALYSES:** Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- Data Completeness  
Noncompliances: None
- Holding Times  
Noncompliances: None
- Laboratory Blank Contamination  
Noncompliances: None
- Field Blank Contamination  
**Noncompliances: Total recoverable phenolics was detected in the equipment blank. See attached page for details.**
- Field Duplicate Precision:  
Noncompliances: None
- Surrogate Recoveries  
Noncompliances: None
- Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MS/MSD recoveries of benzo(g,h,i)perylene and benzo(k)fluoranthene fell below the control limits. No action was taken as the LCS recoveries were compliant.
- Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analyte was detected in the aqueous equipment blank, EB1176, at the following concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Total Recoverable Phenolics	0.03 mg/l	0.15 ug/l

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B" for field blank contamination.

# FTS, LLC

**DATE:** August 27, 2010

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C0H050627

**SAMPLES:** OW-33E, OW-204A, OW-202B, EB-1079-02, OW-31A, OW-27E, TRIP BLANK, OW-17C, OW-35E, OW-44D, OW-201E, R-14E, OW-99D(OW-44D), OW-17A, R-13A, OW-102B, OW-36B, OW-37B

**ANALYSES:** Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- Data Completeness  
Noncompliances: None
- Holding Times  
Noncompliances: None
- Laboratory Blank Contamination  
Noncompliances: None
- Field Blank Contamination  
Noncompliances: None
- Field Duplicate Precision:  
Noncompliances: See attached page for details.
- Surrogate Recoveries  
Noncompliances: None
- Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MSD recovery of total recoverable phenolics was above the control limits. No action was taken as the LCS recovery was compliant.
- Laboratory Control Sample  
Noncompliances: None

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-44D	QUAL	OW-99D	QUAL	RPD
Phenanthrene	0.19	U	0.2		NC

NC – not calculated due to nondetect result

## FTS, LLC

**DATE:** August 27, 2010

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C0H060635

**SAMPLES:** OW-102E, OW-205A, OW-26A, OW-99E(OW-26A), OW-22BR, EB-1175, OW37D, R-14C, TRIP BLANK

**ANALYSES:** Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- Data Completeness  
Noncompliances: None
- Holding Times  
Noncompliances: None
- Laboratory Blank Contamination  
Noncompliances: None
- Field Blank Contamination  
**Noncompliances: Total recoverable phenolics was detected in the equipment blank. See attached page for details.**
- Field Duplicate Precision:  
Noncompliances: See attached page for details.
- Surrogate Recoveries  
Noncompliances: None
- Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MS/MSD recovery of benzo(k)fluoranthene fell below the control limits. No action was taken as the LCS recovery was compliant.
- Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analyte was detected in the aqueous equipment blank, EB-1175, at the following concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Total Recoverable Phenolics	0.017 mg/l	0.085 mg/l

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B" for field blank contamination.

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-26A	QUAL	OW-99E	QUAL	RPD
Acenaphthene	2.4		2		18.18
Anthracene	1.4		1.4		0
Arsenic, dissolved	281		280		0.36
Arsenic, total	275		279		1.44
Fluorene	0.23		0.21	U	NC
Naphthalene	1.7		0.32		136.63*
Phenanthrene	0.32		0.21	U	NC
Total Recoverable Phenolics	0.016		0.024		40*

NC – not calculated due to nondetect result

\* - RPD is greater than 30%, associated samples are qualified as estimated, "J," due to laboratory or field sampling imprecision.