United States Environmental Protection Agency
Region 4
Atlanta Federal Center
61 Forsyth St. SW, Atlanta, GA 30303-8960

July 12, 2005

Mr. Michael Slenska, P.E.
Environmental Manager
Beazer East, Inc.
C/O Three Rivers Management, Inc.
One Oxford Centre, Suite 3000
Pittsburgh, PA 15219-6401

Subject: Cabot/Koppers Superfund Site, Gainesville, Florida ("Site")

Dear Mr. Slenska:

Thank you for your letter dated June 24, 2005, and your attached revised Floridan Monitoring Plan Addendum ("Beazer's Plan Addendum") which was hand delivered during our meeting of June 27, with Jimmy Palmer, Regional Administrator, United States Environmental Protection Agency (EPA), Region 4. EPA has carefully reviewed your submission and hereby disapproves Beazer's Plan Addendum and all other plans previously submitted. As further discussed below, EPA hereby directs Beazer to implement EPA's revised Floridan Monitoring Plan Addendum (enclosed).

In February 2005, Beazer submitted a draft Addendum to the 2004 Floridan Aquifer Monitoring Plan. Beazer received substantial comments on this Addendum from EPA, Gainesville Regional Utilities (GRU), the Florida Department of Environmental Protection (FDEP) and the Alachua County Environmental Protection Department (ACEPD). In a May 2005, letter, GeoTrans, Inc., on behalf of Beazer, responded to these comments and presented Beazer's revised approach. In a meeting held on June 15, 2005, EPA, GRU, FDEP and ACEPD conveyed objections to Beazer's approach.

As stated in your letter of June 24, all parties present at the June 15, meeting concur on the importance of additional upper Floridan aquifer groundwater monitoring at the Site. The seriousness of potential impacts to the Murphree Wellfield is demonstrated by the report submitted to EPA on June 8, 2005, by GRU's expert consultant panel. As you know, these consultants were hired by GRU to review Beazer's fate-and-transport model (completed in October 2004) which predicted that the Murphree Wellfield would not be threatened by Site contaminants. The GRU consultants found a significant error in Beazer's model, namely, that the thickness of the Upper Transmissive Zone (UTZ) of the Floridan aquifer was incorrectly applied. GRU's consultants concluded that several other values used for key parameters were not

representative of the Site. After correcting the model, GRU consultants predict that contaminants from the Koppers Site may reach the Murphree Wellfield in as few as 4 to 5 years. EPA has reviewed the GRU consultants' report and concur with its findings. The results of this model and GRU consultants' report were discussed with Beazer in our June 15, 2005, meeting.

Results of recent investigations conducted at the Site also demonstrate the seriousness of the threat to the Floridan Aquifer and the Murphree wellfield. Investigations have revealed the following: (1) creosote Dense Non-Aqueous Phase Liquids (DNAPLs) have been detected in the intermediate aquifer (Hawthorn Group) over a large area and have been found as deep as 120 feet below ground surface; (2) limited data in deeper zones of the Hawthorn Group indicate that DNAPL may have sunk to the top of, and possibly into, the Floridan aquifer; (3) data from newly-installed monitoring well FW-6, the only Floridan aquifer well drilled near a source area at the Koppers' property, have consistently shown creosote contaminants above Florida Groundwater Cleanup Target Levels; and (4) other Floridan aquifer wells (FW-2, FW-3, and FW-7) located along the perimeter of the Site have indicated low levels of contamination; however, these wells are too shallow to ascertain the potential for significant contamination deeper in the aquifer.

During the June 15, 2005, meeting, EPA, GRU, FDEP, and ACEPD conveyed to you the need for a more thorough and advanced monitoring network than that proposed by Beazer in order to assess the lateral and horizontal extent of contamination. EPA's revised Floridan Monitoring Plan Addendum, developed in collaboration with FDEP, ACEPD, and GRU, was presented to you during the meeting. The plan, which is enclosed with this letter, includes installation of multi-port, quadruple-cased monitoring wells in the Floridan aquifer, immediately downgradient of each of the four source areas, as well as in eight other locations at the Koppers' property. The plan is designed to prevent "carry-down" of DNAPL contaminants into the Floridan aquifer and to allow detection of contamination that may be flowing through discrete permeable zones in the karst aquifer system. The monitoring well locations specified in the plan are based on calculations from the groundwater modeling analysis conducted by GRU's consultants. Implementation of this plan will allow for more comprehensive characterization of contamination in the Floridan aquifer and the threat to the Murphree wellfield, and will support the development of appropriate remedial strategies that will be protective of human health and the environment.

As was the case with plans previously submitted by Beazer, Beazer's current Plan Addendum does not adequately assess the extent of contamination in the Floridan aquifer and the potential threat to the Murphree wellfield. Furthermore, Beazer's Plan Addendum is inconsistent with EPA's enclosed revised Floridan Monitoring Plan Addendum, as neither Beazer's proposed well locations, nor construction methods, correlate with those in EPA's plan. EPA's primary objections to Beazer's proposed Plan Addendum are summarized below:

(1) The source area wells are located too far away from the source areas. Contamination could easily follow flow paths that miss the proposed well locations.

(2) The transect wells are located too far away from the source areas and too far from one another. Due to anisotropy and discrete flow paths typical of karst aquifers, significant plumes of contamination could be missed by Beazer's proposed wells.
(3) The well construction proposed by Beazer, in all but two wells, provides long, open bore holes which would promote vertical mixing of groundwater between aquifer zones. Problems presented with this construction include: significant dilution of contaminant concentrations, potential for transfer of contaminated water between zones, and inability to assess horizontal extent of contamination.

Pursuant to the Unilateral Administrative Order (UAO) issued by EPA to Beazer and Koppers Industries, Inc., on March 22, 1991, and amended on April 28, 1994, you are hereby directed to implement the attached revised Floridan Monitoring Plan Addendum. Section XI Paragraph A of the UAO gives EPA the authority to require Additional Work necessary to meet Site performance standards and protect human health and the environment. In the UAO Amendment, EPA made the determination that additional work was necessary to protect human health and the environment at the Site. Specifically, Paragraph 6 of the UAO Amendment requires Beazer and Koppers Industries, Inc., to "modify the RD workplan to include the feasibility study dealing with the source areas and the depth of the DNAPLs." Beazer is directed to perform the additional work required by the UAO Amendment by implementing the Revised Floridan Aquifer Monitoring Plan Addendum. Pursuant to the terms specified in the 1991 UAO (XI.A.) and the 1994 UAO Amendment (Paragraph 7), Beazer is required to notify EPA of its intent to perform such additional work within seven (7) days after receipt of this letter.

You state in your letter of June 24, that Beazer is currently pursuing implementation of its Plan Addendum. Please note that work conducted under a work plan not approved by EPA does not relieve Beazer of its obligation to comply with the UAO, or with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and its implementing regulations, or from implementing any other work required by EPA pursuant to CERCLA.

EPA looks forward to hearing from you within the time frame specified above. If you have any technical questions, please do not hesitate to call me at (404) 562-8910 or Amy Williams, Remedial Project Manager, at (404) 562-8776. If you have any legal questions, please call Caroline Philson, Assistant Regional Counsel, at (404) 562-9588.

Sincerely,

Randall Chaffins, Acting Chief
Superfund Remedial and
Technical Services Branch

Enclosure: Floridan Aquifer Monitoring Plan

cc: Kelsey Helton, FDEP
John Mousa, ACEPD
Brett Goodman, GRU
Rick Hutton, GRU

Revised Floridan Aquifer Monitoring Plan Addendum

Specifications for Drilling, Installation and Testing of Multilevel Wells in the Floridan Aquifer, Koppers, Gainesville

Introduction

The intent of this set of recommendations is to supplement the FAMP[1] by installation of 12 multilevel sampling wells in the upper transmissive zone (UTZ) of the Floridan Aquifer (FLA) beneath the Koppers facility. Instead of large open hole intervals of the type indicated in the FAMP, a suitable multilevel monitoring system must be used that isolates the zones being monitored and has been demonstrated to be suitable for long-term monitoring of the principal contaminants of concern, i.e., creosote components, other semi-volatile compounds detected beneath the Cabot Carbon/Koppers site, pentachlorophenol, 2,4-dimethylphenol, arsenic, copper and chromium.

Objective

The goal is to define the vertical and horizontal extent of contamination in the UTZ beneath the Koppers property. To install and test 12 multilevel wells capable of sampling ground water from the UTZ of the FLA beneath the Koppers facility in Gainesville, Florida. Eight of the multilevel well locations comprise a U-shaped transect across the site. The other 4 wells are situated close to each of the four identified source areas.

Because high levels of creosote contamination have been detected in Floridan monitoring well FW-6, and lower levels have been detected in FW-2, FW-3 and FW-7, there is the immediate need to characterize the nature of groundwater contamination in the Floridan Aquifer beneath the Koppers facility. The multilevel wells are necessary to identify and sample high hydraulic conductivity fracture/solution channel pathways and contaminant migration through the limestone matrix. The proposed transect pattern considers the potentially anisotropic nature of the karstic limestone, which could result in groundwater flow directions which are not parallel to the hydraulic gradient beneath the site.

The spacing between the current monitoring well locations in the Floridan aquifer is approximately 700 feet or more. Furthermore, all of these wells have single, 10-foot screens which penetrate less than 25 feet into the UTZ of the Ocala limestone. The proposed monitoring well transects provide a spacing of approximately 300 feet. The 300 ft spacing represents the maximum acceptable spacing due to the karstic nature of the aquifer (with its fractures and dissolution channels and cavities), and is necessary to increase the confidence that significant contaminant plumes will be identified.

This spacing is also necessary based on the potential mass discharge of contaminants from the site. To further assess the required spacing of the monitoring locations, two contaminant mass

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[1]Floridan Aquifer Monitoring Plan, Cabot Carbon/Koppers Superfund Site, Gainesville, Florida. Prepared for Beazer East, Inc., Gainesville, Florida. Prepared by TRC, Irvine, California, Project No. 29016402, June 2004. [Referred to as the 'FAMP']

discharge calculations were performed. Firstly, it was calculated that a contaminant mass discharge rate of 3 to 40 lbs/year arriving at the Murphree Well Field from the Koppers site would cause detectable contaminant concentrations (>0.5 µg/L) in the extracted water depending on the number of wells affected (based on individual wells (3 lbs/year) and 15 wells pumping 25.3 MGD (40 lbs/year). Secondly, the possible contaminant mass discharge rate leaving the Koppers site was estimated using an average naphthalene concentration of 1700 ug/L, which is based on concentrations measured in monitoring well FW-6.

If this monitoring well represented the contaminant concentrations in groundwater plume measuring 500 feet in width and 100 feet in thickness, the contaminant mass discharge rate leaving the Koppers site could be about 130 lbs/year (based on a hydraulic conductivity of 50 ft/day and a hydraulic gradient of 0.0013). Such a plume could migrate in this karstic limestone undetected between, and/or below the current monitoring locations and could have a substantial effect on the water quality at the well field. As a result of considering these mass discharge rate calculations and the karstic geology in the Ocala Limestone, a spacing of 300 feet or less is considered to be essential for the proposed well locations along the monitoring transect. Due to the downward vertical gradient in the Ocala Limestone and the results of the GeoTrans model showing pathlines substantially below the current shallow Floridan wells (less than 25 feet into the Ocala Limestone), the multilevels should have sampling ports approximately every 10 feet throughout the estimated 100 foot thickness of the UTZ of the Ocala Limestone. A determination of specific depths for sampling ports at each multilevel will be made after logging the well.

Multilevel System Specifications

1. The proposed Multilevel System (MS) shall be submitted for approval by stakeholders 30 days prior to proposed well construction in the form of a work plan. EPA shall have final authority on approving multilevel monitoring system.
2. Sufficient MS equipment and well construction materials shall be made available at the construction site to start installation of the MS within 24 hours after the completion of well development.
3. The MS shall have been proven in its capability to successfully characterize the vertical distribution of dissolved contamination in karstic rocks at depths of up to 300 ft.
4. The proposed MS shall be capable of monitoring a minimum of 10 discrete intervals within each single 4-inch nominal diameter borehole.
5. The MS shall provide for measurement of fluid pressure (or piezometric level), collection of fluid samples, and testing of hydraulic conductivity in each monitoring zone.
6. The MS shall accommodate design changes (i.e., number and/or relative positions of monitoring ports and packers) at any time up to the moment of installation. The equipment necessary to make design changes will be onsite at time of installation.
7. The MS shall be able to be installed through a temporary casing smaller than the borehole in order to reach the desired installation depth in cases of poor borehole conditions and/or

cavernous openings.

8. The MS shall be able to provide a good quality seal using packers in boreholes or casings ranging from 3 to 5-inches inside diameter without custom fabrication.
9. The MS shall allow for removal of the monitoring system and decommissioning of the monitoring well.
10. The MS shall accommodate periodic verification testing of hydraulic integrity of all components and proper functioning of all components, including calibration of pressure sensors.
11. Pressure sensing devices and water sampling devices shall be removable for maintenance or replacement in event of failure without compromising borehole seals.
12. The MS shall enable the periodic testing of individual borehole seals for purposes of evaluating seal integrity.
13. The system shall be capable of recovering groundwater samples at formation pressure.
14. The MS shall provide the option for continuous automated monitoring of fluid pressure for observation of long-term pressure trends or the transient effects of short-term pumping or other testing activities.

Well Locations

1. Well locations shall be as generally shown on Figure 1.
2. Final well locations shall be agreed upon by stakeholders 7 days prior to starting well construction.
3. Should a well need to be relocated, the following steps shall be completed before commencing with construction of the relocated well:
    a. Representatives from EPA, GRU, and ACEPD shall be contacted and informed of the field conditions necessitating well relocation.
    b. Well shall be relocated based on consensus of stakeholders and Beazer.
    c. Stakeholders shall have 6 hours from initial contact to comment on proposed new locations.
    d. EPA shall have final authority on relocating a well.
4. The sequence of well completions will be
        a. Install the eight transect wells
        b. Install the four source-area wells

    Precise order of installation of the wells will be determined during discussions between Beazer and stakeholders. .
5. EPA shall have final authority on approving well locations and the order of installation.

Well Construction Specifications

These specifications address installation, completion and testing of the 12 multilevel sampling wells. Specifically, each of the twelve multilevel sampling wells shall be installed using appropriate methods to achieve a quadruple cased and grouted well to ensure there is no drag-down of contamination. All well drilling and construction operations shall be consistent

with the EPA Region 4 Science and Ecosystem Support Division's Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, Florida Department of Environmental Regulation Chapter 62-532 F.A.C., and St. John's River Water Management District well construction requirements. All required state and water management district permits shall be obtained prior to well construction. Figure 2 (excerpted from GeoTrans, September 2004) is provided as a guide showing the construction for the upper two conductor casings. Note that Figure 2 is a triple cased well. The proposed wells are quadruple cased and the resulting borehole dimensions will differ from those in Figure 2. Figure 3 shows the lower two casings of the proposed quadruple cased wells. Borehole dimensions for each casing shall be adequate for a minimum 2-inch radial annulus.

The installation procedures are as follows:

1. Install black steel conductor casing and grout within the Upper Hawthorn Clay to prevent seepage of creosote or other contaminants into the borehole.
2. Set black steel conductor casing and grout within the Middle Hawthorn Clay.
3. Drill approximately 2-ft into the Lower Hawthorn Clay (LHC) and set black steel conductor casing and grout. During drilling, collect continuous core/split-spoon samples through the Hawthorn Group sediments between the middle Hawthorn Clay and the LHC and to the anticipated casing point. Cores/split-spoon samples shall be logged and photographed. If mobile or residual DNAPL is evident, submit soil samples for chemical analyses, and proceed to Step 4.
4. Proceed using the sonic drilling method - or another method that will assure that loss of circulation is avoided - to the top of the UTZ pulling and inspecting cores every five feet. If mobile DNAPL is observed in the cores below 20-ft below the top of the LHC, plug and abandon the borehole. If mobile DNAPL is absent, below 20-ft into the LHC, then set protective casing at the top of the UTZ (Ocala Limestone).
5. Drill a nominal 4-inch diameter hole to the contact between the UTZ and the semi-confining unit (SCU) within the FLA (or approximately to 250 ft below ground surface if the semi-confining unit is not clearly identified above that depth). The deepest sampling port within the UTZ should be as close to the UTZ-SCU contact as possible and if the manufacturer's recommendations for the MS system selected require a minimum depth of casing below the last sampling port, the final drilling depth should be sufficient to accommodate these recommendations. Rock cores should be collected and evaluated to determine the hydrogeologic characteristics of the aquifer materials and the contact of the UTZ and the SCU. HQ coring should be considered in selecting a methodology for drilling and coring the UTZ. If drilling fluid is required, add an appropriate conservative tracer to the drilling fluid.
6. Log the open hole using a caliper tool to determine borehole dimensions.
7. Develop the borehole by setting a pump in the open borehole at increasingly deep 10-foot sections and pumping until the discharge has less than 10 NTU. Monitor development water for presence of the conservative tracer.
8. Log the hole using down-hole video camera, caliper, flow meter, fluid conductivity, fluid temperature, long and short-normal resistivity, natural gamma, and compensated acoustic

tools. Fluid conductivity, fluid temperature, flow meter, and video tools should be run under both static and pumped conditions if possible.

9. Analyze the logging and core data and identify multilevel monitoring zones in which to set packers and install the monitoring ports.

a. Monitoring zones are anticipated to be every 10-feet, unless field conditions warrant longer or shorter monitoring zones.

b. Monitoring zones shall be selected as agreed to by stakeholder representatives and Beazer in the field.

c. EPA will have final authority on monitoring zone selection.

10. Install and complete multilevel monitoring system within 24 hours of the completion of well development and logging.

11. Purge each port or zone in each well of one liter of ground water prior to collecting the initial set of groundwater samples from each port. Purging prior to subsequent sampling events should not be necessary.

12. Conduct a rising head test of each multilevel zone to estimate the hydraulic conductivity of that zone.

Well Sampling Specifications

1. Sample collection procedures should be consistent with the methods recommended by the manufacturer of the multilevel monitoring wells. Water recovered during purging should be monitored, to the extent practical, for standard field parameters: pH, specific conductance, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity.

2. Groundwater elevations will be recorded from every port at each multilevel installation prior to collection of groundwater samples.

3. Initial groundwater samples should be collected within 2 weeks of completion of construction of each multilevel monitoring well installation. After initial sampling and any repeat sampling (performed in the event of data rejection by the laboratory, e.g. "R" qualified data) or confirmatory sampling (see below), all multilevel installations should be sampled for two quarters. After that time, Beazer shall submit a plan to EPA for long-term monitoring of these installations and other Floridan aquifer monitoring wells. This plan must take into account observed contaminant concentrations, contaminant distributions in the UTZ, and other factors, as appropriate At a minimum, quarterly monitoring for 1 year will be required at all sampling points where ground-water contamination has been detected in either the initial sampling round or a confirmation monitoring event.

Analysis and Reporting

1. Groundwater samples should be analyzed for: volatile organic compounds (EPA Method 8260B); semi-volatile organic compounds (EPA Method 8270C); dissolved arsenic, chromium, copper and zinc (EPA Method 6020 or 6010B) comparable to the current Floridan aquifer monitoring program; and the conservative tracer.

2. Initial samples should be analyzed and reported within 2 weeks of sample collection. Analysis results should be transmitted to US EPA and all designated stakeholders by Beazer within 5 days of their receipt from the analytical laboratory. These results should be marked clearly as "preliminary" until subjected to data validation and reporting by Beazer.

3. The following is a listing of the names and affiliations of stakeholders that should receive copies of all preliminary results:

   Amy Williams, US EPA
   Kelsey Helton, FDEP
   John Mousa, ACEPD
   Brett Goodman, GRU

4. Confirmatory samples should be collected from any monitoring interval (i.e. specific port in a multilevel installation) within 2 weeks if the initial sample results from the transect monitoring installations yield concentrations exceeding MCLs (maximum concentration limits) for any individual constituent or 10 μg/L for the sum of phenolic compounds. The criterion for the phenolic compounds is based on their potential to cause taste and odor problems in finished water after chlorination. This procedure for confirmatory sampling will apply only to the transect wells and not to the source zone multilevel wells.

5. When all initial samples and any confirmatory samples from the multilevel wells have been collected, analyzed and subjected to quality assurance procedures, Beazer will submit a report to US EPA and all other stakeholders to present and describe the results. A comparable report will be submitted by Beazer for each subsequent round of quarterly sampling.

6. Following 2 quarters of monitoring after the initial sampling, Beazer will submit a proposal for long-term monitoring of groundwater elevations and groundwater quality from these installations. It is expected that continued routine sampling of all of the ports in all of the multilevel wells will not be necessary depending on the hydrogeologic and chemical results from the these installations and the findings of other site investigation activities.