



363 Centennial Parkway
Suite 210
Louisville, Colorado 80027

www.geotransinc.com

(303) 665-4390; FAX (303) 665-4391

October 17, 2005

Ms. Amy McLaughlin
Remedial Project Manager
U.S. Environmental Protection Agency, Region IV
4WD-SRTMB
61 Forsyth Street
Atlanta, Georgia 30303-3104

Subject: Upper Floridan Monitoring Well Alternative Design, Koppers Inc. Site in
Gainesville, FL

Dear Ms. McLaughlin:

On behalf of Beazer East, Inc. (Beazer), enclosed with this letter is the alternative well design (see Attachment A) for the Upper Floridan (UF) Aquifer monitoring program. The alternative well design is consistent with the design discussed in our conference call with Stakeholders on October 12, 2005. This alternative well design is only proposed for areas of the KI site (Site) where unconsolidated, UF deposits prevent the construction of the original well design. The original well design will be constructed in areas of the Site where competent, consolidated bedrock is present and allows for an open borehole completion in the UF Aquifer. Included with this attachment are two figures: 1) Figure 1 shows the temporary abandonment design for FW-10B, FW12B and FW-14B, and 2) Figure 2 shows the conceptual alternative well design for unconsolidated deposits at the Site.

Please feel free to contact me at (303) 665-4390 if you have any questions or comments.

Sincerely,

James R. Erickson
Program Manager

Attachment

cc: M. Slenska, BEI
M. Brouman, BEI
W. O'Steen, EPA
K. Helton, FDEP
B. Goodman, GRU
L. Paul, KI
J. Herber, JEA
J. Moussa, ACEPD

Attachment A: Upper Floridan Monitoring Well Installation and Alternative Design

The following is a discussion of the modifications to the Upper Floridan (UF) Aquifer monitoring well installation program detailed in the U.S. EPA letter dated July 12, 2005, as requested in our telephone conversation on October 12, 2005.

The original well design for competent UF bedrock was based on a quadruple-casing design that telescopes from an 18” casing diameter at the surface down to a 4” diameter well casing completed about 5 feet into the top of the Upper Floridan Aquifer. After all four casings were grouted from their completion depth to land surface, a 4” nominal diameter open borehole was to be drilled 100 feet into the Upper Floridan Aquifer for the installation of a multi-level sampling system.

The alternative well design is proposed for areas of the site where the carbonate rocks in UF Aquifer are highly weathered and unconsolidated, such that an open borehole cannot be constructed below the 4” well casing. The alternative well design will consist of a 4” diameter multiple-screened well, completed in a nominal 8” diameter borehole. The following is a description of the well design changes as compared to the original well design discussed in the U.S. EPA July 12, 2005 letter to Beazer. This discussion will address each of the five major topic headings detailed in the U.S. EPA letter.

Section 1.0 Multilevel System Specifications

- 1) No changes to the Multilevel System (MS) requirements.

Section 2.0 Well Locations

- 1) No changes to the well locations, other than those previously discussed with the U.S. EPA at the start of the project.

Section 3.0 Well Construction Specifications

The U.S. EPA letter did not include a discussion of temporary well abandonment procedures for boreholes extending into the UF Aquifer. Figure 1 shows the conceptual design of well abandonment procedures performed for wells FW-10B, FW-12B and FW-14B. The temporary abandonment was performed to prevent vertical migration and mixing within the UF Aquifer, while the alternative well design was developed. The temporary abandonment basically consists of alternating layers of filter sand and low-permeability isolation sand over a 100-ft interval of the UF Aquifer. An approximately 30-ft cement grout plug was placed from the top of the UF Aquifer to the base of the 8” diameter isolation casing to minimize vertical migration within the lower Hawthorn Group clay unit. The abandonment design utilized for the UF Aquifer wells meets the criteria and specifications of the Saint Johns River Water Management District (SJRWMD) (Chapter 40C-3, F.A.C.).

Well construction and logging details for the original well design are discussed in items 1 through 12 in the U.S. EPA letter. The alternative well design will result in modifications to items 5 through 9. Specifically, a nominal 8" diameter borehole will be drilled approximately 100 feet below the top of the UF Aquifer contact. In addition, geophysical logging is not possible for the alternative well design and therefore, will not be performed. A detailed discussion of the alternative well design and procedures are provided below. The conceptual design for an alternative well is shown in Figure 2.

- 1) The primary change to the original well design is the installation of four, 4" diameter, 10-ft well screens in place of the previously proposed open borehole beneath the 4" diameter well casing. The alternative well design will consist of 10-ft stainless-steel, wire-wrapped screens separated from each other by 10-ft of blank stainless-steel casing. Ten-ft well screen intervals are typically used with the Westbay sampling system to allow for the multi-level sampling and purge ports to be approximately centered across the 10-ft screen. A shorter 5-ft screen interval would result in the sampling and purge ports being located on the top and bottom of the screen interval making it more difficult to purge and sample the well. Approximately 15 ft of blank casing will also be installed at the bottom of the well to accommodate the multi-level sampling system specifications and approximately 10 ft of blank casing will be installed across the upper 10 ft of the UF Aquifer to accommodate the installation of annular sealant and grout below the lower Hawthorn Group clay unit. Approximately 40 ft of stainless steel blank casing will extend from the top of the upper screen interval to the base of the 8" diameter black steel isolation casing. The remaining well casing will consist of approximately 110 ft of black steel casing extending to land surface.
- 2) The slot-size for the well screen will be established after samples of the unconsolidated carbonate rock are analyzed by the well-screen manufacturer. The well screen manufacturer will recommend an appropriate slot size and filter pack based on the physical properties of the UF Aquifer deposits.
- 3) The alternative well design will be constructed the same as the original design, through the installation of the three isolation casings. The only change in the well design will be the installation of the 4" casing. The alternative well design requires that the rotasonic rig advance the 7" nominal diameter override casing to the completion depth of the well (approximately 100 ft into the UF Aquifer). The original well design only had the 7" override casing advancing 5 ft into the UF Aquifer, with a 3.8" borehole extending the remaining 95 ft. The 7" override casing needs to be extended to the completion depth of the well in order to construct the 4" diameter well inside of the override casing. The well construction technique is similar to the construction of a monitoring well inside of a hollow-stem auger. The override casing prevents the unconsolidated deposits from flowing into the borehole during the construction of the well. The alternating blank casing and screens within the UF Aquifer will consist of 15 feet of blank casing at the base of the well, followed by 10 feet of screen and 10 feet of blank casing extending to within 10 feet of contact of the lower HG clay with the UF Aquifer. The top

- of the uppermost screen will be approximately 10 feet below the contact of the lower Hawthorn Group clay and the UF Aquifer to allow for the placement of 5 ft of isolation material and 5 ft of cement grout below this contact.
- 4) Once the 7" override casing is advanced to the well completion depth and the drill cuttings have been flushed out of the inside of the casing, the 4" well will be constructed. The 4" well will be constructed by screwing flush-thread casing and screens together and lowering the assembled casing inside of the override casing. After the 4" casing and screens have been lowered to the completion depth, the screen filter pack and isolation material will be placed in the void space between the override casing and 4" well. The filter pack will be sized to match the screen slot size and the isolation material will consist of a fine, low-permeability sand, consistent with requirements of the SJRWMD. The void space opposite the 15 feet of blank casing at the base of the well will be backfilled with a fine sand isolation material. Once the isolation material has been placed, a coarse filter sand material will be placed opposite the screen interval extending approximately 1 foot below and 1 foot above the top of the screen interval. The alternating isolation material and filter sand material will progress upwards in the borehole until the upper screen filter material has been placed. Approximately 5 feet of isolation material will be placed above the uppermost screen interval to help prevent cement grout infiltration into the upper screen interval. A cement grout will extend from 5 ft above the upper screen interval to land surface.
 - 5) The limited void space between the override casing (6.23" ID) and 4" well casing (4.5" OD) prevents the use of a tremmie pipe for the installation of the filter pack and isolation material. Therefore, all filter pack and isolation materials will be placed by pouring the material from land surface. To prevent bridging, the override and well casings will be vibrated during the material installation process. A measuring tape will be utilized during the material installation to tag the top of the filter pack and isolation material. In addition, the override casing will be slowly removed as the filter pack and isolation materials are placed. It is anticipated that the installation of the filter pack and isolation materials will require 1 to 1.5 days to complete to allow sufficient time for material settlement during the installation process.
 - 6) After the final 5 ft of isolation material has been placed, the override casing will be completely removed from the borehole and a tremmie pipe will be installed to place the cement grout. The cement grout will be placed in two stages to help minimize cement contamination in the upper screen interval. The first grouting stage consists of placing approximately 35 feet of cement grout from the top of the isolation material to the base of the 8" isolation casing. This grout will be allowed to cure for 6 to 12 hrs before grouting the well to land surface.
 - 7) The alternative well design will eliminate the need for geophysical logging. The original well design required geophysical logging be performed in the open borehole below the 4" diameter casing. The primary purpose of the geophysical logging was to identify the locations of packer seats and to quantify potential flow zones within the borehole. An open borehole will not

be utilized in the alternative well design; therefore, geophysical logging will not be performed.

Section 4.0 Well Sampling Specifications

- 1) No changes to analysis and reporting.

Section 5.0 Analysis and Reporting

- 1) No changes to analysis and reporting.

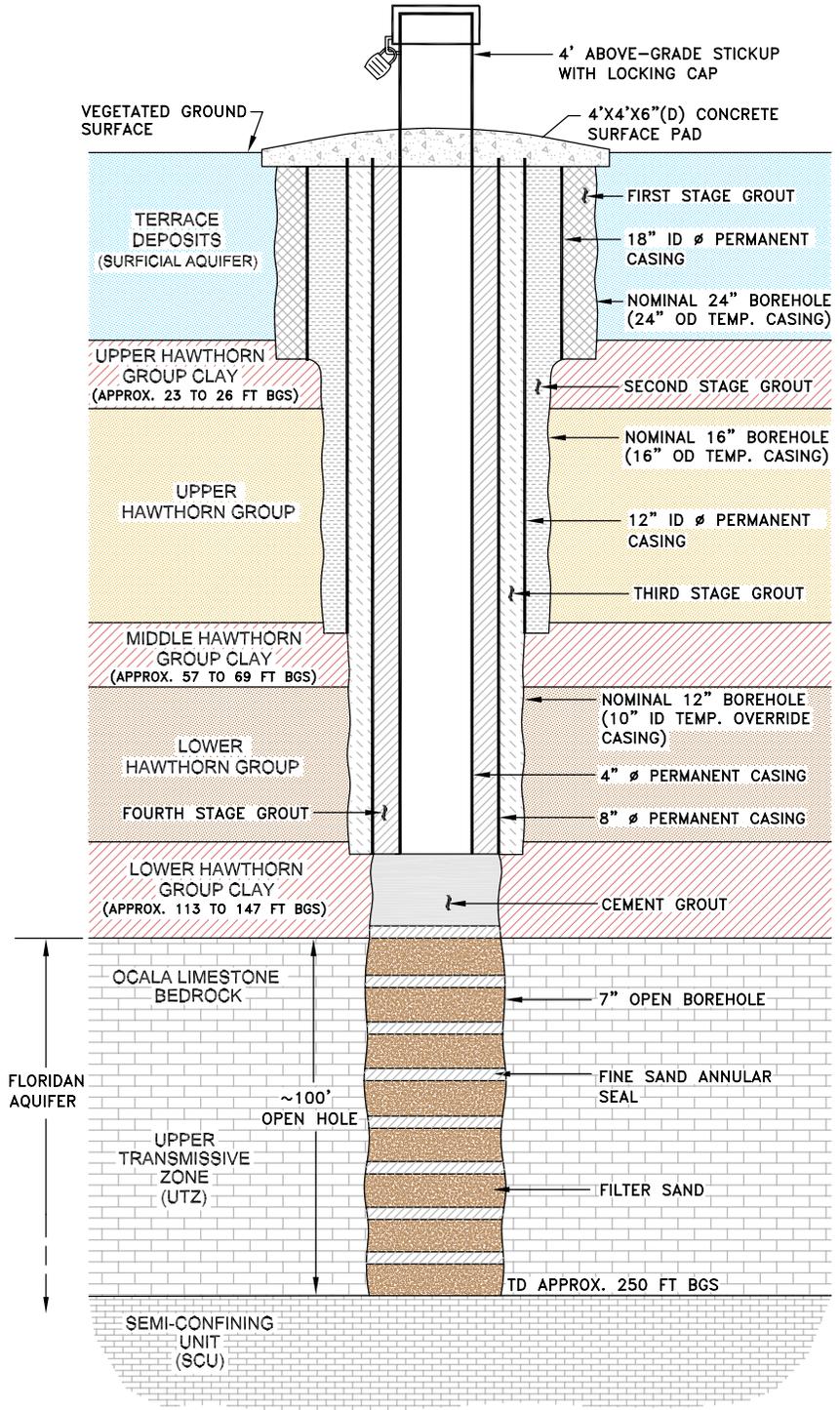
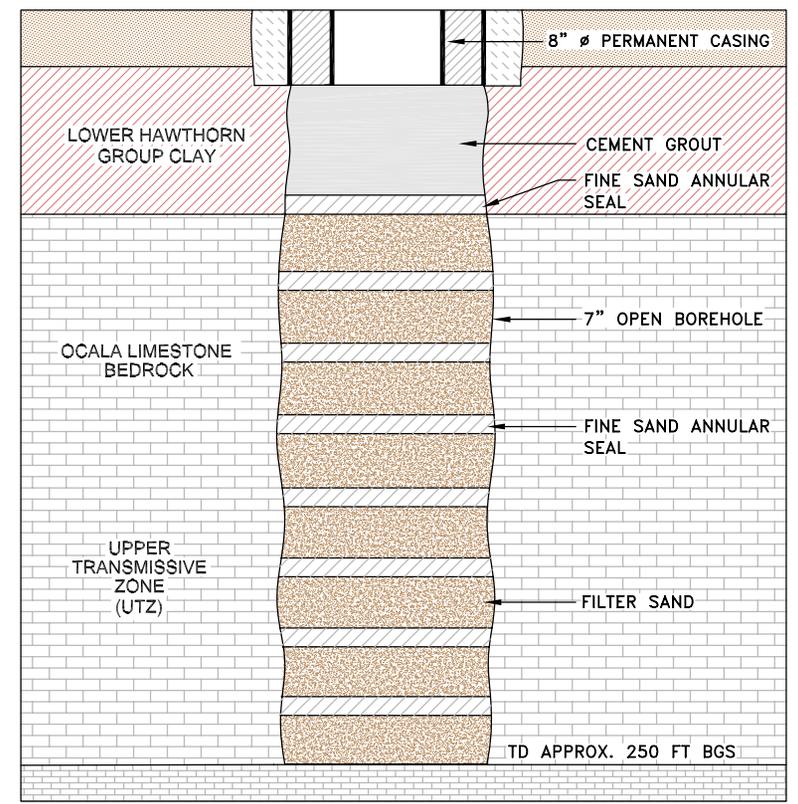


Figure 1. Temporary abandonment design for boreholes extending into the Upper Floridan Aquifer.



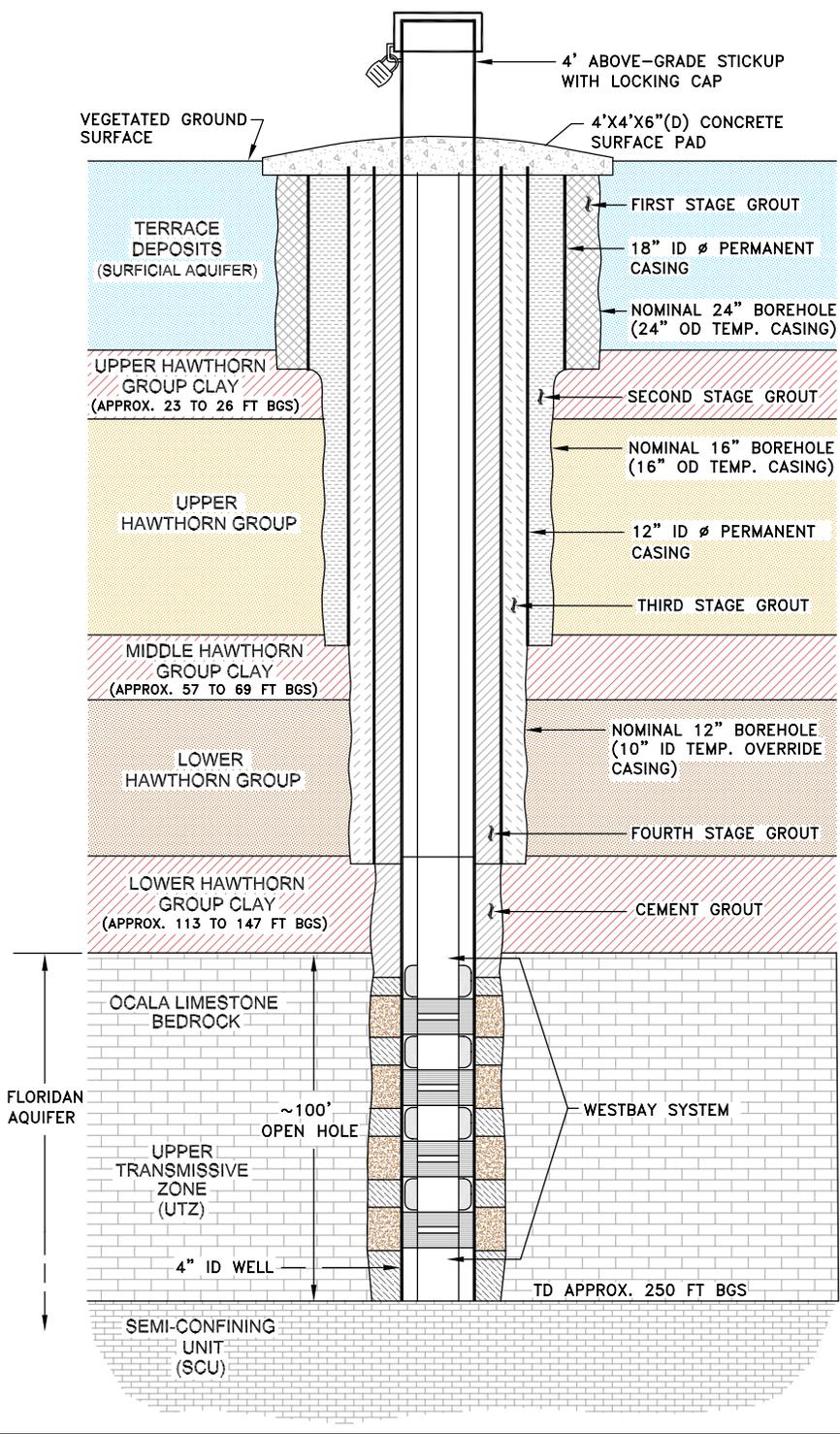


Figure 2. Proposed alternative quadruple-cased Floridan aquifer well for the Upper Transmissive Zone, with multi-level screens and sampling system.

