



# Florida Department of Environmental Protection

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April 3, 2012

Mr. Scott Miller  
Remedial Project Manager  
United States Environmental Protection Agency  
Region IV, Superfund North Florida Section  
61 Forsyth Street, SW  
Atlanta, Georgia 30303

RE: February 2012 Revised Insitu Geochemical Stabilization Hawthorn Group Pilot Study Work Plan, Cabot Carbon/Koppers Superfund site

Dear Scott:

Thank you for the opportunity to provide DEP review comments on the revised Insitu Geochemical Stabilization (ISGS) Hawthorn Group Pilot Study Work Plan for the Koppers portion of the referenced Superfund site. Revisions to the work plan including the revised project performance milestones and goals table reflect many of the areas discussed in our December 2011 stakeholders meeting. We look forward to completion of DNAPL characterization, installation of DNAPL recovery wells and appropriate performance and compliance monitoring wells, and implementation and performance monitoring of the ISGS pilot test, to support evaluation of its effectiveness as a final site remedial technology. To that end we offer the following comments.

## Phase I DNAPL Characterization:

- We are pleased to see that the DNAPL delineation and treatment will address both free-phase and residual DNAPL sources. We note that the work plan continues to recommend a targeted treatment approach. As commented previously, all DNAPL should be treated and we recommend a broader delivery across the Upper Hawthorn Group (UHG) profile. However, we anticipate that the final treatment approach will be based on the characterization data.
- We understand that the number and location of performance and compliance monitoring wells will be finalized following review of the Phase I Characterization data report. Monitoring will include a baseline monitoring event prior to the Phase II pre-demonstration ISGS test. Monitoring wells, including surficial, UHG, and Lower Hawthorn Group wells, anticipated for performance and/or compliance monitoring should be included in the scope of

baseline sampling. Although it is not stated in the text of the work plan, we understand pursuant to our December 2011 meeting and as indicated in the footnote of Table 1, project performance milestones and goals, that installation of Lower Hawthorn Group (LHG) wells will be addressed after completion of characterization.

- Appendix D- The work plan proposes to substitute more coarse grained (non-site related) materials into the test columns if the columns filled with site soil become plugged from exposure to the various reagent concentrations. It remains unclear how the proposed substitution will provide representative, site specific measurements of the permeability changes associated with each reagent concentrations. We recommend that this approach not be used.

#### Performance monitoring-

- Fundamental to the demonstrated success of the pilot is an adequate monitoring system to show what happened and support evaluation of performance of the ISGS technology. An understanding of the extent and degree of LHG contamination is a critical component of the conceptual site model in this area and essential for confirmation of the overall effectiveness of the site remedy. As discussed in previous comments, baseline sampling and subsequent performance/compliance monitoring should include the installation and monitoring of LHG wells. These wells would be used to 1) determine the vertical extent of groundwater contamination and DNAPL and provide baseline sampling data prior to injection activities, and 2) monitor any vertical movement of ISGS injectate during and following injection activities. DEP recommends a minimum of 3 LHG monitoring wells in the Process area including a location east of HG-15S in the area of UHB-9/LHB-2/LHB-10.
- DEP recommends the installation of an Upper Floridan Aquifer (UFA) monitoring well(s) in or immediately east of the process area. Significantly elevated UHG and LHG groundwater contaminant concentrations present immediately off the Koppers property support the need for UFA well(s) in this area. We anticipate that data from the new LHG wells will also support this recommendation.
- The work plan appears inconsistent in its description of the anticipated locations for additional Upper Hawthorn Group (UHG) monitoring wells -, eg, UHG wells down gradient of the treatment area and/or within the former process area. DEP recommends installation of interior UHG monitoring wells within the treatment area in addition to the DNAPL recovery wells and UIC ZOD wells, in order to provide further documentation of the response to ISGS treatment and trends in groundwater quality improvement. We request that the work plan or post-

Phase I interim report also discusses how the proposed well network will be designed such that the entire thickness of the UHG can be effectively monitored.

- Well construction - We recommend the use of permanent isolation casing in UHG recovery well construction to seal off the surficial aquifer. We question the use of multi-screened UHG recovery wells, particularly if DNAPL recovery rates will be used to evaluate the effectiveness of ISGS. At a minimum, we recommend sealing off the annulus behind blank casing sections between individual screens with bentonite in these recovery wells to force DNAPL into the screened sections rather than allowing migration down the annulus sand pack.
- Monitoring well sampling- The work plan proposes to collect "volume averaged samples" based on 1200 gallons of water recovered from each UHG monitoring well, during baseline as well as performance monitoring events. We question whether or not this method will provide representative groundwater quality samples that will allow evaluation of ISGS performance including trend analysis or comparison to either historic groundwater data or other data being collected at the site. We recommend the continued use of conventional sampling methods. If averaging is desired, multiple discrete samples could be collected and analyzed individually for each well and those results averaged.
- (0-6 month) Immediate term- The work plan proposes the collection of 15 cores for visual confirmation of ISGS/DNAPL contact and encrustation following the full scale ISGS pilot injections. Please clarify how those 15 locations will be determined in order to ensure that they are adequate to provide a representative picture of ISGS distribution, contact and response over the entire treatment area.

### Reporting/Schedule

- The work plan proposes submittal of 3 reports during the 5 year pilot test. DEP recommends that data reports with conclusions and recommendations be provided at the completion of each performance monitoring phase.
- The work plan is open ended with regard to monitoring beyond the 5 year performance period and does not appear to provide a means of closure with regard to final evaluation and confirmation of ISGS as the selected alternative, which we understood was the intent of the pilot. The work plan does, however, identify five performance criteria that will apply and be further evaluated during the post-5 year period. These include: 1) ongoing containment and stabilization of free-phase DNAPLs, 2) the long-term geochemical stability of precipitate shells, 3) reductions in down gradient dissolved-phase PAH concentrations, 4) permeability reduction in treatment zones, and 5) reduced groundwater flux

through treatment zones. If these are the criteria on which to base success of the ISGS treatment technology at the site and the purpose of the pilot is to confirm its applicability and effectiveness, DEP recommends that the appropriate testing and evaluation of those performance criteria be conducted during the last year of the (36-60 month) Long Term Performance Monitoring period and provided in a final ISGS pilot study report. This report would summarize the results of the pilot and draw conclusions regarding its demonstration of the effectiveness and applicability of the ISGS technology as the final selected remedial technology for this area of the site. DEP recommends that the methods of evaluation of these criteria be identified in the work plan.

### UIC Requirements and Zone of Discharge (ZOD)

- As noted in the revised work plan, a permit is not required under Superfund for work conducted on site; however, documentation demonstrating that the technical and substantive requirements of a permit will be satisfied is required.

The previous ISGS pilot injection for the surficial aquifer was authorized via a site-specific Variance and DEP-approved pilot work plan and included submittal of the UIC Memo Summary to ensure consistency and compliance with substantive UIC regulatory requirements (Chapters 62-520.310 and 62-528.600) and the terms of the site-specific Variance. Similarly, a final UHG pilot work plan and updated UIC Memo Summary is necessary to ensure appropriate monitoring and compliance with UIC requirements prior to implementation of the UHG pre-demonstration and full scale pilot injections. We anticipate that updates to the work plan and/or the UIC Memo may be necessary before both the pre-demonstration and full scale pilot phases and will consider previously collected site data.

- We note the following in review of this revised work plan:
  - The proposed UIC monitoring scope is not comprehensive. Monitoring should include surficial, UHG and LHG monitoring wells to demonstrate compliance with ZOD and absence of migration into unauthorized aquifers.
  - UIC compliance monitoring frequency is not identified in the work plan.
  - As noted previously, we recommend the UHG ZOD monitoring well(s) include a location east of HG 15S. A LHG well should also be installed to confirm compliance and absence of vertical migration.
  - Please identify the monitoring wells to be included in baseline sampling for UIC compliance including background wells.
  - The work plan has proposed an ISGS migration contingency plan that proposes use of the surficial recovery system to address migration east of

the property boundary. It is unlikely that this will effectively address UHG migration beyond the ZOD.

**Please refer to the September 30, 2011 comments for further detail and recommendations as it relates to UIC. They are provided below for your convenience.**

Any changes in the ISGS reagent composition since the authorizing variance was issued should also be identified and monitored as required. If changes in reagent formulation result in injection of chemicals at concentrations above primary, secondary or minimum criteria, the constituents that exceed standards must be identified and a new variance may be required.

The ISGS pilot work plan and UIC Memo Summary should clearly identify the following: the specific authorizing Variance; the proposed radius of the temporary zone of discharge (ZOD); specific locations, screen intervals/depths of proposed compliance monitoring well points; and frequency of sampling and proposed analytes, consistent with the Variance and UIC requirements. Please note that UIC groundwater monitoring is required beyond the 1 year minimum duration if UIC analytes have not returned to standards or background within that time frame.

UIC monitoring should include ZOD compliance wells in the UHG as well as monitoring wells in the surficial aquifer and LHG to monitor and mitigate potential ISGS constituent migration into other aquifers. DEP recommends that the UHG ZOD network proposed in Figure 7 include a compliance well down gradient of HG-15S. The work plan and UIC memo should also identify specific locations proposed for compliance wells in the surficial and LHG. This should include monitoring points within the footprint of the treatment area (*added 4/3/2012, where feasible*) as well as down gradient to document behavior of ISGS injectate and any observed day lighting or vertical migration across aquifers, indicating a possible need to modify UHG injection rates. Note that UIC requires baseline sampling including background wells prior to injection activities.

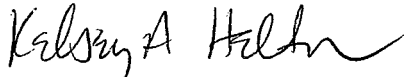
Surficial aquifer monitoring points may include MW25A/B, MW23AR/BR, and M-2A/B, M31 and M-30A/B as well as a surficial monitoring well in the vicinity of UHB-9/LHB-2/UHB-10. We also recommend monitoring of HG-6S/D and HG26S/D on a minimum quarterly basis before and after all injection events. Should purple colored groundwater be observed, UIC indicator analytes should be included in lab analysis. Unpermitted migration laterally or vertically should trigger an evaluation of corrective action including but not limited to additional monitoring.

The work plan has proposed that ZOD wells may not be needed in the surficial aquifer as the groundwater recovery system is located within 150 feet down gradient of the proposed area of injection. Compliance sampling of existing monitoring or recovery wells at the Koppers property boundary is sufficient to demonstrate UIC compliance. However, if monitoring of reagent constituents indicates that one or more are present in these boundary wells at concentrations above standards, installation and monitoring of a down gradient ZOD compliance well(s) will be necessary to demonstrate that unpermitted migration is not occurring.

The draft work plan has proposed to notify "any interested parties" of the upcoming injections by issuing a Fact Sheet. Given the heightened interest of area residents, we support that proposal and recommend that either EPA or Beazer update the public on the upcoming ISGS pilot test activities via distribution of a Fact Sheet to individuals and regulatory agencies on EPA's site mailing list, after the work plan has been finalized and prior to injection activities at the site.

Thank you for consideration of these comments. Please call me at 850-245-8969 if you would like to discuss these comments further.

Sincerely,



Kelsey A. Helton  
Bureau of Waste Cleanup

cc: Zoe Kulakowski, DEP  
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