

Cabot Remedial Design Work Plan
GRU Comments
September 15, 2017

This document provides GRU's comments to the Remedial Design Work Plan dated August 2017. GRU appreciates Cabot's collaborative, working group approach to moving forward at this Superfund Site.

Comments #1 through #14 address the RD Work Plan specifically. Comments #15 through #32 summarize comments made by GRU on January 20, 2015 and August 5, 2016 to the Focused Feasibility Study. GRU includes those comments here because we believe they have not been fully addressed, they are still pertinent to the investigation and remediation at the Cabot Site, and because we are not sure they have been conveyed to Geosyntec. The RD Work Plan is silent on most of these comments.

It may be appropriate for Cabot to address some of our comments to the RD Work Plan in the PDI WP but GRU believes they need to be conveyed now so Cabot and others are aware of GRU's position and so we do not lose track of them.

GRU's comments to the RD Work Plan are:

1. Section 1.1 – It should be acknowledged that, even with optimization, attaining GW cleanup goals in the surficial aquifer will be a very long-term process.
2. Section 2.2 – The RD Work Plan states that one RAO is to “Restore groundwater quality in the downgradient plume to achieve health-based criteria, as appropriate”. The paragraph following the bullets includes the statement “The effectiveness of the remedy in the context of groundwater RAOs will be evaluated based on its ability to reduce the footprint of the groundwater plume over time and decrease concentrations within the plume to eventually attain health-based criteria and meet GCTLs at the downgradient Site boundary”. GRU asks:
 - a. What does the qualifying language “as appropriate” mean?
 - b. Is the RAO to achieve health-based criteria at the property boundary – and is it acceptable to exceed health-based criteria up to the property boundary?

3. Section 2.1.5 – It can be said that removal and natural attenuation of COCs in much of the surficial aquifer was rapid relative to the rate of removal and natural attenuation in the HG; however, it was not rapid. COC concentrations in the surficial still exceed GCTLs and DNAPL has recently been observed in the surficial aquifer vadose zone at the west side of the Chevrolet dealership property.
4. Section 2.1.5 – The RD WP states, “Groundwater quality effects associated with the Former Processing and Storage Area are localized and attenuate within a short distance”. The remedy employed at the Cabot Site must address full extent of groundwater contaminants in all aquifers. Figures in the FFS confirm that contaminant plumes have not been adequately constrained. See the naphthalene and benzene plume maps in particular. GRU believes that additional characterization of groundwater contamination is required before the groundwater remedy can be designed. We do not see additional groundwater characterization described in this RD Work Plan.
5. Section 2.2.4, Part II: Groundwater Extraction – The RD Work Plan states, “Extraction within the containment system will mitigate the vertical migration from the UHG into underlying aquifers...” The word “mitigate” is ambiguous. It should be understood that GW extraction from within the containment will reduce but not eliminate the 25 - 30 ft head difference and downward migration between the UGH and the LHG.
6. Section 2.2.4, Part II: Groundwater Extraction – The RD Work Plan states “The extraction system will operate until it meets performance metrics that will be established during the RD” and LHG groundwater extraction and treatment will be used as a contingency measure in the unlikely event that concentrations in the LHG do not attenuate in response to the UGH remedy. GRU asks:
 - a. When will Cabot’s proposed performance metrics be shared with stakeholders? GRU believes that waiting until the 50% design stage is too late.
 - b. Given that the MHG clay may significantly retard vertical migration from the UHG to the LHG, how long does Cabot propose waiting to evaluate the response of LHG COC concentrations to the UGH remedy?

7. Section 3.3 – One of the Preliminary Design Investigation objectives must be to finalize groundwater characterization at the site.
8. Section 3.3 – The PDI Work Plan will included details regarding borings for the vertical barrier wall design. When will the alignment/footprint of the slurry wall be determined? Can Cabot share that with stakeholders now?
9. Section 3.4.1, Part I: Containment - How will the geotechnical borings be drilled? At what interval will soil samples be collected? Are these the same as the SPT borings discussed in the 3rd sub-bullet? (This comment may be more appropriately addressed in the PDI Work Plan; however, certain details regarding the borings are provided in this RD Work Plan so GRU is providing these comments now so they can be recorded.)
10. Section 3.4.2, Part 2: Groundwater Extraction – The RD Work Plan proposes conducting a step-drawdown test at HG-28S. Was the pre-sampling purge rate in that well sufficient to conduct a step-drawdown test?
11. In making our comments to the FFS, GRU agreed that there was sufficient knowledge to complete that document. However, GRU took the position that additional groundwater investigation will be required to meet two objectives for the remedial design and long-term monitoring of remedial performance:
 - a. Delineation of the dissolved-plume boundaries and characterization of additional sources to facilitate remedial design.
 - b. Installation of additional permanent wells for monitoring of plume migration and the attainment of remedial actions goals. Some of these well locations could also satisfy the objective 1, above.It is now time to plan for that investigation.
12. Section 3.4.2, Part 2: In order to design a groundwater extraction system that will operate after the Cabot and Koppers containment systems are in place – Cabot must know what the future flow fields look like. Current flow directions in the Surficial and the UHG, and potentially in the LHG will be highly altered from that observed today.

As GRU stated previously - Cabot must conduct appropriate modeling of groundwater flow in the surficial aquifer, and the Upper and Lower Hawthorn Group. The model should take into account the upgradient barriers to flow that will be caused by the Cabot barrier wall and the much larger Koppers barrier wall. The model should also account for vertical flow through the Upper, Middle, and Lower Hawthorn Clays. Understanding flow fields downgradient of the slurry wall will be important in remediating and monitoring the dissolved plume outside the containment wall.

13. Section 4.2.1 – GRU strongly believes that results of the PDI must be available to stakeholders before Cabot submits the 50% design document. Periodic updates and meetings/conference calls should be part of the plan and schedule.
14. Schedule
 - a. GRU suggests a decision point where Cabot, EPA, and stakeholders agree on slurry wall alignment and other details before reaching 50% design stage.
 - b. The schedule contains no provision for additional characterization of groundwater contamination at the site. As stated previously, GRU strongly believes this must be completed before the groundwater remedy can be designed.

**Cabot Focused Feasibility Study
GRU Comments
January 20, 2015 and August 5, 2016**

15. Throughout the FFS Cabot states that the document addresses “pine tar-related” contaminants or impacts and in Section 4.3.2 identifies those contaminants as phenol, cresols (2-methylphenol, and 3&4-methylphenol) and 2,4-dimethylphenol). GRU does not believe that Cabot is free from responsibility for any of the BTEX and naphthalene detected in the comingled Cabot/Koppers plume. GRU believes that the FFS should address all contaminants that exceed cleanup criteria within the Cabot portion of the Superfund site.

16. Specifically regarding GCTLs - the FFS states “Florida GCTLs that are based on organoleptic end points are not appropriate groundwater CUGs for remedial action at the site.” Cabot has proposed alternatives to the established Florida Groundwater Cleanup Target Levels (GCTLs) for several “key pine processing-related COCs”. Those COCs are phenol, cresols (2-methylphenol, and 3&4-methylphenol) and 2,4-dimethylphenol. GRU disagrees with Cabot’s position regarding organoleptic end points and believes that the most stringent criteria, whether health-based or organoleptic, should be enforced at this site. We understand that FDEP has not calculated organoleptic GCTLs for 3&4-methylphenol and 2,4-dimethylphenol. We believe that must be done and that the lower of the organoleptic and the health-based GCTLs should drive cleanup.
17. GRU believes it is appropriate to specify different temporary points of compliance for different aquifer zones. For example, if EPA believed it was warranted, HG-37S could be a temporary point of compliance for the Upper Hawthorn while another well could be the point of compliance for the Lower Hawthorn.
18. Data for LHG groundwater should be plotted on the Base-UHG maps (being differentiated from the UHG data) so the reader can easily identify plume trends above and below the Middle Hawthorn Group confining unit (see GRU’s annotated maps). The plume in the LHG is higher concentration than that in the UHG at some locations.
19. ITW-13 and ITW-14 and the NE Lagoon should be plotted on all appropriate maps, even if the Cabot does not intend to address that source.
20. The FFS states: “At the few locations with exceedances, the PAH concentrations are expected to attenuate and attain background concentrations or comply with the PAH Threshold Effects Concentration...” How long does Cabot believe it will take PAH concentrations to attenuate to background concentrations?
21. Not all parties agree that all, or most, of the constituents in HG-29D arise from leakage along the boring. Regardless, HG-29D should be shown and data posted, but could be flagged with an

appropriate qualifier. Cabot did not address this comment. GRU continues to believe the HG-29D data should be shown and could be flagged/qualified.

22. The barrier wall alternatives will not provide vertical containment of contaminant migration. Therefore, monitoring must be robust in the LHG and sufficient to allow detection of contaminants moving vertically from the UHG into the LHG or laterally within the LHG. The footprint of Cabot-related constituents in the LHG appears smaller than the footprint in the UHG but there are fewer monitoring locations in the LHG. There is clear evidence of migration laterally through the LHG from Koppers over distances of hundreds of feet, and comparable migration might occur from Cabot. There is also evidence of migration to the FLA from Koppers, by DNAPL creosote at least, and perhaps dissolved constituents. Given the size of the combined footprint of Koppers/Cabot constituents in the LHG, monitoring must also be sufficient and robust in the FLA downgradient of this footprint. See also GRU's Comment #32 regarding additional FLA monitoring.
23. The FFS should accommodate remediating all contaminants at the site to the currently enforceable cleanup standards. That includes contaminants both upgradient, cross-gradient, and downgradient of the Former Cabot Lagoons and includes BTEX and naphthalene.
24. The FFS states that Cabot will continue monitoring GW quality in the downgradient plume until "the State's organoleptic GCTLs have been met." GRU needs confirmation of this statement in light of Cabot's recalculation of the phenol cleanup goal using health-based criteria. The GCTL for phenol=10 µg/L (organoleptic criterion), but there are no organoleptic criteria established by FEDP for 2-, 3-, or 4-methyl phenol, or 2,4-dimethyl phenol because there are already low concentration health-based criteria for these compounds. If health-based criteria were raised, organoleptic criteria for these compounds would likely be in the low µg/L range but these have not yet been established by the State.
25. During the December 15, 2015 meeting, FDEP expressed the opinion that Cabot must document that the dissolved plume is stable or shrinking. GRU agrees with FDEP's position and believes

it is necessary to determine the process(es) that contribute to plume stability. Because biodegradation is likely to be a component of the remedial strategy proposed for the Cabot Site, GRU believes Cabot should document that degradation is occurring in this dissolved plume and if it would be feasible to enhance the rate of natural degradation. Cabot should determine if there are biodegradation or other indicator compounds that can be monitored in order to provide additional lines of evidence to support the degradation rates and/or process.

26. MNA is proposed for LHG in all remedial alternatives. How will Cabot confirm that natural attenuation is occurring in the LHG
27. GRU believes that containment of contamination in the surficial aquifer and the Upper Hawthorn Group at the Cabot lagoon source area is a reasonable component of a remedial alternative – with the following understandings/caveats:
 - a. Groundwater extraction from within the containment will be required to assure an inward hydraulic gradient (lower hydraulic head inside the wall relative to head outside the wall) so horizontal leakage through the barrier will always be from the outside of the wall into the containment area. Water can enter a containment area by leakage through the vertical barrier wall and by infiltration through the impermeable cap. This pumping will be required until COC concentrations inside the wall reach GCTLs.
 - b. Treatment/mass reduction of groundwater containing high-concentrations of COCs inside the wall will be required. That pumping will reduce the long-term threat - over multiple decades - of highly contaminated groundwater flowing across the Middle Hawthorn Clay.
 - c. Substantial downward gradient, from the Upper Hawthorn Group to the Lower Hawthorn Group exists at the former lagoon source area and cannot be reversed by pumping inside the barrier wall.
 - d. Treatment of the dissolved plume downgradient of the barrier wall will be required.

28. Cabot should commit to evaluating and, if appropriate, implementing future technologies that may be able to treat the highly contaminated source area (reduce contaminant mass) within the barrier wall.
29. Cabot must conduct appropriate modeling of groundwater flow in the surficial aquifer, and the Upper and Lower Hawthorn Group. The model should take into account the upgradient barriers to flow that will be caused by the Cabot barrier wall and the much larger Koppers barrier wall. The model should also account for vertical flow through the Upper, Middle, and Lower Hawthorn Clays. Understanding flow fields downgradient of the slurry wall will be important in remediating and monitoring the dissolved plume outside the containment wall.
30. Regarding the proposed groundwater extraction system outside the containment area, the FFS states “it is estimated that the P&T system will be operated until the mass removal rate achieves an asymptote...” Does Cabot assume the asymptote will be very near the cleanup goal? What if the asymptote is not near the cleanup goal? Please clarify.
31. Substantial concentrations of phenolics were reported at WS-27, WS-28, and WS-29 just west of the interceptor trench and associated with the former Northeast Lagoon. Will the interceptor trench be operated until these areas have attenuated? Will additional wells be added to monitor this area?
32. The location of CFW-1 was selected to be in an area of low COC concentrations within the Hawthorn Group with the understanding that the direction of groundwater flow within the Upper Floridan Aquifer was essentially to the north. Contaminants detected in groundwater samples collected from CFW-1 exhibit a strong Koppers fingerprint – and that indicates an eastward component of groundwater flow in the Upper Floridan Aquifer at that location. If there is an eastward component of flow near the lagoons, then CFW-1 is not downgradient of that potential source. GRU believes that an Upper Floridan well is required downgradient of the former Cabot Lagoons. We believe that this is particularly

important in light of the apparent eastern flow component and the fact that a substantial contaminant mass will remain in the UHG for many years that has the potential to migrate downward into the LHG and Floridan Aquifer. (The barrier wall cannot address the potential for downward migration).