

Georgia Department of Natural Resources

Environmental Protection Division-Land Protection Branch

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Judson H. Turner, Director

December 29, 2014

VIA E-MAIL AND U.S. MAIL

HERCULES INCORPORATED

c/o Timothy D. Hassett, Project Manager

500 Hercules Road

Wilmington, DE 19808-1599

Subject: First through Third Semi-Annual VRP Progress Reports [December 10, 2014 through September 15, 2014] and Revised Property Deed with Deed Notice
Hercules Incorporated, Savannah Plant, HSI Site No. 10696/VRP Site 1332420701
3000 Louisville Road, Savannah, Chatham County, Georgia 31415
(Tax Parcel Nos. 2-0734-01-001 and 2-0734-03-001)

Dear Mr. Hassett:

The Georgia Environmental Protection Division (EPD) has reviewed the subject documents for the two properties known as the Hercules Inc. Savannah Plant Site, HSI 10696. Said review has been conducted in reference to: 1) the January 10, 2014 EPD letter containing comments on the April 9, 2012 Voluntary Remediation and Investigation Plan (VIRP) and Voluntary Remediation Program (VRP) Application, 2) the Georgia Voluntary Remediation Act (the Act), and 3) the Georgia Hazardous Site Response Rules (the Rules). Based on said review, EPD has the following comments regarding the subject submittals.

JANUARY 10, 2014 EPD COMMENTS

1. **Comments #3, 14, 15, and 16** of the January 10, 2014 have been adequately addressed.
2. **Comment #1 of the referenced EPD letter:** Note that there is a slight discrepancy between the total acreage for the VRP properties indicated in Section 1 of the second and third progress reports (28.42 acres) and the sum of the acreages for the properties in the revised deed (29.09 acres). Please correct references to VRP property acreage accordingly in future submittals.
3. **Comment #2 of January 10, 2014 EPD letter:** This comment is should be addressed in the next semi-annual report. The requested tables and figures are needed for EPD's evaluation of achievement of contaminant delineation and compliance with cleanup standards.
4. **Comment #4 of January 10, 2014 EPD letter:** The bulleted items provided in Section 2 of the second and third progress reports are not adequate as they do not include all the information referenced in the comment. Furthermore, a bulleted item in Section 2 of the second and third progress reports state the referenced VIRP was approved by EPD on March 15, 2013. Note that although the site was admitted into the VRP, EPD issued several comments in the January 10, 2014 letter regarding the VIRP that should be addressed in order to ensure that the final CSR is complete; therefore, the VIRP was not accepted as submitted and stated in the referenced bulleted item. The issuance of said comments should be included as one of the bulleted items required by Comment #4 in the referenced letter.
5. **Comment #5 (Regulated Substances Released/ Contaminants of Concern; "COCs"):** Future submittals must include a table summarizing contaminants of concern with highest detected concentration identified by media, sample location, and sample depth (soil) or aquifer zone (groundwater). EPD considers those substances/parameters (including pH) included on Tables I through III attached to the January 10, 2014 EPD letter to be the contaminants of concern (COCs) for soil and groundwater at the site as of the submittal date of the April 9, 2012 VIRP. Note the following:
 - a. Corrosivity, reported as pH in standard units (SU), must be added as a "Contaminant of Concern (COC)" in the required table. Said measurements, which may be field measured, in soil and groundwater in the caustic substance release area are subject to delineation and cleanup requirements pursuant to the Rules and Act. Table 1 (*Risk Reduction Standards*, assumed to have been submitted *in lieu* of the required table) of the second and third progress reports does not include said "COC" or the associated acceptable delineation and cleanup criteria (see Parts b and c of Comment #10).

- b. 2-Methylnaphthalene is not a regulated substance listed in Appendix I of the Rules and is not considered to be a COC. Analytical results should be removed from tables and figures summarizing COCs and soil and groundwater analytical results.
 - c. Phenol and *bis*(2-chloroethyl)ether detected in groundwater during one or more of the last two groundwater monitoring events must be considered as potential COCs that are subject to delineation and cleanup requirements pursuant to the Act (see Comment #15 below) and should be included in the required table referenced above.
 - d. EPD recommends that all "PCB"-associated analytical results be summarized together on tables and figures with dioxin and chlorinated dibenzofuran results separate from those tables and figures summarizing other COC analytical results based on how delineation and cleanup standards were determined. When posting dioxin, chlorinated dibenzofuran, and "PCB"-associated results, please post in the following manner:
 - Individual Aroclor mixture results (only those Aroclors that have been detected in any environmental media at the site) on both tables and figures,
 - Individual non-dioxin-like PCB congener results (tables only) and their summation as total PCB results (both tables and figures),
 - Individual dioxin-like PCB congener results (tables only) and their individual 2,3,7,8-TCDD Toxicity Equivalency Factor (TEF)-adjusted concentrations (tables only),
 - Individual dioxin and chlorinated dibenzofuran results (tables only) and their 2,3,7,8-TCDD TEF-adjusted concentrations (tables only).
 - Summed 2,3,7,8-TCDD TEF-adjusted dioxin-like PCB congener, dioxin, and chlorinated dibenzofuran analytical results for comparison to the 2,3,7,8-TCDD delineation and cleanup standards on both tables and figures.
6. **Comment #6:** The referenced EPD comment has not been adequately addressed to date as the information requested has not been provided.
 7. **Comment #7:** Revised versions of the tables referenced in Part a. and the figures referenced in Part b.i. of this comment has not been submitted to date. Furthermore, not all items referenced in Part b.iii were depicted on the cross-sections provided in the second and third progress reports. Note that said information is necessary for EPD evaluation of conclusions regarding achievement of COC delineation and site compliance with cleanup standards.
 8. **Comments #8 and 9:** EPD will defer evaluation of the referenced EPD comments until: 1) all potential source areas have been investigated, 2) achievement of COC delineation has been delineated, and 3) human and ecological risk assessment activities and groundwater fate and transport modeling have been completed and results submitted with required figures and tables.
 9. **Comment #10:**
 - a. The use of monitoring well MW-F8 as a POD well for the application of Type 4 RRS as cleanup standards in soil in the former 50s and 60s tank/landfill area is inadequate as it is not located hydraulically downgradient of the area based on the shallow potentiometric surface maps provided in the VIRP and the second and third progress reports. Monitoring wells must be either selected from existing wells or installed, as appropriate, to the west and southwest as part of the monitoring network for this area. Furthermore, benzene must be added to the groundwater analytical suite in the required POD wells, due to elevated benzene concentrations detected in soil during past UST closure activities.
 - b. The progress reports indicate that monitoring wells MW-F6, MW-26, and MW-28 could not be accessed for groundwater depth measurements and/or sampling due to well head integrity issues. Please make repairs to said wells as soon feasible so that they may be accessed for the referenced purposes. If the wells cannot be repaired, please contact the site compliance officer, Ms. Carolyn Daniels, to discuss decommissioning and potential re-installation of said wells as appropriate. Note that monitoring well MW-26 is the only existing monitoring well available for establishing current groundwater conditions in or near the caustic release area and a Dowtherm oil release area based on past soil analytical results.

EPD will defer further comment on the current groundwater monitoring network until the figures and tables referenced in Comment # 3 above have been revised and submitted and Comment #10 below has been adequately addressed.
 10. **Comments #11 through #13:** EPD on Tables I through III in the January 10, 2014 EPD letter addressed to you. Copies Tables I through III attached to the January 10, 2014 EPD letter, annotated with hand written notations in blue ink, are attached to this letter and are referenced in the following comments.

- a. **Risk Reduction Standards:** Note that the attached tables only provided Type 1 RRS and general residential (highest of the values Type 1 and Type 2) and non-residential (the highest determined values between Type 3 and Type) RRS. The acceptable individual Type 2, Type 3, or Type 4 RRS values used to determine the general residential and non-residential RRS shown on attached Tables II and III were not provided by EPD. However:
- Acceptable Type 1 RRS are those listed on attached Table I. Table 1 of the second and third progress report *incorrectly* lists the general residential RRS shown on attached Tables II and III as Type 1 RRS.
 - It appears that the values summarized under the column labeled as "Type 4 RRS", which were not provided on the attached tables, on Table 1 of the second and third progress reports appears to be a mixture of values from multiple columns on attached Tables II and III and do not match the general residential or non-residential RRS provided on attached Tables II or III. Please see Comment # 10.b below regarding the use of general residential and non-residential RRS as preliminary cleanup standards.
 - Corrosivity: Please see Comment #5a above.
 - Cresol and Xylene Isomers: Table 1 of the second and third progress reports incorrectly list RRS for the combined reported detected values of the m- and p-isomers of cresol and xylene as not applicable. If the detected concentrations two isomers of each of the two substances is reported as a combined value, the applicable RRS is the most stringent of the applicable RRS values for the individual isomers. For example, the Type 1 RRS for combined m- and p-cresol in groundwater 0.01 mg/L which is the Type 1 RRS for each of the individual isomers. The Type 1 RRS for combined m- and p- xylenes should be 0.001 mg/L, but will likely need to default to 0.002 mg/L since the standard PQL for combined reporting using EPA Method 8260 is 0.002 mg/L.
 - Phenol and bis(2-chloroethyl)ether: At a minimum, soil and groundwater Type 1 RRS must be determined for these substances detected in recently acquired groundwater samples, which should default to either background levels or laboratory detection limits defined in the Rules, as potential delineation standards. The determination of other residential or non-residential RRS will only be necessary if said substances are detected in soil and/or groundwater at concentrations exceeding their delineation standards.

EPD does not require a duplication of the attached Tables I through III summarizing individual RRS be provided in future submittals. *However, separate tables summarizing delineation and cleanup standards, with columns indicating the criterion used for their selection,* must be provided as discussed in Comments # 10 b. and c. below.

- b. **Delineation Criteria and Standards:** Acceptable criteria for selecting soil and groundwater contaminant delineation standards are listed in §12-8-108(1)(A)-(E) of the Act. Attached Table I (Acceptable Soil and Groundwater Type 1 RRS) summarizes the only RRS acceptable for application as COC delineation standards for soil and groundwater at the site as they are considered to be the default residential cleanup standards. Those values labeled as "Type 1 RRS" on Table 1 of the second and third VRP progress reports appear to be consistent with those listed as acceptable general non-residential RRS on the attached Tables II and III, some of which defaulted to Type 2 RRS, which are not one of the acceptable criteria for delineation standards pursuant to the Act.
- c. **Cleanup Standards:** Site-specific (Type 5 RRS) cleanup standards to be applied at specific locations within the site properties may be shown as "to be determined" on the required cleanup standards summary table(s) until such time as their values have been established. Note:
- Hercules *may* choose to apply Type 1 RRS, summarized on attached Table I, as cleanup standards for soil and groundwater at the site. However, those columns marked as "Column A" in ink on attached Tables I and II are the general residential RRS, which default to higher Type 2 RRS values for some COCs, that are acceptable for use as soil and groundwater cleanup standards at the site regardless of property use. Said values were provided by EPD since continued validation of property usage and an environmental covenant limiting property usage to non-residential purposes will be required until site compliance with soil and groundwater non-residential RRS is demonstrated. It appears that said RRS are incorrectly labeled as "Type 1 RRS" on Table 1 of the second and third progress reports.
 - Hercules *may* choose Type 4 RRS, which were not provided in the attached tables, as cleanup standards for soil and groundwater at the site. However, acceptable general non-residential RRS, which default to the highest values for acceptable Type 3 and Type 4 RRS, are provided on attached Tables II and III. The values summarized under the column labeled "Type 4 RRS" on Table 1 of the second and third progress reports incorrectly mixed values from several columns on the attached Tables II and III.
 - Groundwater: Acceptable general residential RRS for groundwater are listed in the column marked with blue ink as "Column A" on attached Table II.

- If the *general non-residential RRS* are to be applied as cleanup standards for soil, Hercules must determine if they will apply non-residential RRS to: 1) surface (0 to 2 ft bgs) and subsurface (>2 ft bgs) soil separately or 2) soil within the entire vadose zone (from ground surface to the water table), see Comment #13.d. of the January 10, 2014 EPD letter.
 - Columns B1 and B2 of attached Table III are the acceptable non-residential RRS for surface and subsurface soil, respectively, if the first option is chosen, in which case soil analytical results must be separated accordingly on associated tables and figures in future submittals.
 - Column C of attached Table III lists the acceptable non-residential RRS to be applied to soil in the entire vadose zone if the second option is chosen. It appears that Hercules has selected the second option based on a review of Table 1 in the second and third progress reports, which incorrectly refers to “Type 4 RRS” and incorrectly defaults to the *least* stringent of the non-residential values for surface and subsurface soils.

Note that responses to several of the parts of this comment may require revisions to conclusions regarding achievement of COC delineation and/or compliance with cleanup levels in soil and groundwater and will require revisions to multiple figures and tables summarizing soil and groundwater conditions.

11. Comment 15. of the January 10, 2014 EPD letter:

- a. Comment # 15.c.i has not been addressed as neither a revised Table 3a of the VIRP or narrative addressing the apparent discrepancy have been submitted to EPD.
- b. Discrepancies on tables and figures noted in Comments #15.b. and 15.c.iii continue to be perpetuated in the second and third progress reports. For example:
 - The notation regarding the analytical reporting limit, assumed to be representative of background levels, for *bis(2-chloroethyl)ether* in groundwater is incomplete on Table 5a of the third progress report.
 - The qualifiers <, U, UC, and UC156 next to several of the PCB and/or asbestos groundwater analytical results are not provided in the foot note notations for Table 5b in the third progress report.

ADDITIONAL GENERAL COMMENTS

12. Field Procedures and Documentation (Groundwater Sampling):

- a. Groundwater purging techniques described in Section 3.2 of the second and third progress reports are not consistent with current US EPA Science and Ecosystem Support Division (ESD) standard operation procedures (SOPs) as outlined in SESDPROC-301-R3 (*Groundwater Sampling*) effective March 6, 2013. Furthermore, stabilization criteria listed for several parameters on associated field sampling records are not consistent with ESD SOPs, *nor are they consistent with the criteria described in the referenced progress report narratives*. Please adjust field purging methods and associated field records and narratives accordingly in the future.
- b. Several pieces of critical information are missing from the narratives describing groundwater purging and sample collection techniques and/or the associated field sampling records. In the future, *all* of the following information must be included on field sampling records, at a minimum, provided in future submittals documenting groundwater sampling activities:
 - A description of the method used to purge the well as described in SESDPROC-301-R3 or subsequent version thereof, *including pump type* (i.e., peristaltic, bladder, submersible), and *specific method by which the final water samples were withdrawn from the wells* (i.e. peristaltic pump/vacuum jug for SVOC analysis, peristaltic pump/“straw method” for VOCs, submersible pump or bailer, etc.),
 - *Volume (in gallons) of water initially in the well* and final volume (in gallons) of water purged,
 - Purge rate, initial depth to water prior to insertion of the purging device, depth (in feet) to water during the purge process, *depth (in feet) to the pump intake during purge process*, stabilization parameter measurements during purge process, and *the intake depth of the sampling device*.
 - Composition of pump delivery tubing, bladders (for bladder pumps), or bailers used to collect samples.

13. EPD received two paper copies of the third semi-annual progress report along with two electronic copies on compact discs (cds). Only one paper copy of submittals greater than 25 pages total are required when two cd copies are provided.

14. EPD noted several apparent discrepancies, errors, inconsistencies, and/or omissions within the subject submittals in addition to those mentioned in comments above. For example: *Indenof1,2,3-cdIpyrene*, a site COC, is misspelled in the RRS summary tables and in the legends and analytical summary tables on Figures 5a and 5b of second VRP progress report and on Figure 5b of the second VRP progress report.

Mr. Timothy Hassett
Former Hercules Inc. Savannah Plant, 3000 Louisville Road, Savannah, Chatham County, GA, HSI 10696/VRP1332420701
December 29, 2014
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If you have any questions regarding the comments contained herein and in the January 10, 2014 EPD letter, please contact Carolyn L. Daniels, P.G. of the Response and Remediation Program at (404) 657-8646.

Sincerely,

A handwritten signature in black ink, appearing to read "David Reuland". The signature is fluid and cursive, written over a light blue horizontal line.

David Reuland
Unit Coordinator
Response and Remediation Program

Attachments: Tables I through III (Approved RRS Summaries) with hand written notations

File: 242-0236 (VRP1332420701/HSI No. 10696)

c: Ms. Johnnie M. Quiller, Solenis LLP (via mail)

Mr. David M. Wilderman, P.G., Arcadis U.S., Inc. (via mail and email)

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