GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Land Protection Branch
2 Martin Luther King, Jr. Drive
Suite 1054, East Tower
Atlanta, Georgia 30334
404-657-8600

June 28, 2017

VIA U.S. MAIL AND EMAIL

Hercules, LLC
c/o Timothy D. Hassett, Project Manager
500 Hercules Road
Wilmington, DE 19808-1599

Subject: Semi-Annual Progress Report #8 dated March 15, 2017
Response to EPD Comment Letter dated January 5, 2017
Hercules Inc., HSI No. 10696
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 Voluntary Remediation Program (VRP) Semi-Annual Progress Report #8 dated March 15, 2017 for the referenced site. This report presented the Hercules, LLC (Hercules) responses to the EPD comment letter dated January 5, 2017. EPD has the following comments on the Hercules responses:

1. **Response to Comment #1 of January 5, 2017 EPD Letter: Ecological Risk Assessment**
   a. **Response to Comment #1 of May 11, 2016 EPD Letter:** The response to the referenced May 11, 2016 comment is acceptable. EPD accepts the 2015 Region 4 EPA sediment quality benchmark (SQB) of 0.0003 mg/kg for dioxin TEQ based on the regional equilibrium partitioning (EqP) approach and concurs that based on comparison of sediment dioxin TEQ detections to the updated SQB further chemical refinement is not warranted.
   b. **Response to Comment #2 of May 11, 2016 EPD Letter:** EPD concurs with the proposed revision and the response to the referenced comment is acceptable.
   c. **Response Comment #3 of May 11, 2016 EPD Letter:**
      i. **3a**: Please refer to Part a. of this comment.
      ii. **3b**: The supporting chemical-specific parameter values were modified appropriately; however, the EqP equation presented differs from Region 4 EPA's recommended EqP model-based approach to developing alternate sediment quality benchmarks for organic constituents (EPA 2015). The difference appears to be due to the determination of porosity. EPD derived an SQB of 0.552 mg/kg using the following default equation from Region 4 EPA's Draft Ecological Risk Assessment Guidance (2015; see Equation 3):

$$SQBsed = WQB \times [Koc \times foc + (\Theta m/pw)]$$

Where:

SQBsed = EqP-based sediment SQB normalized to 1% organic carbon (µg/kg 1% OC)
WQB = water quality benchmark (µg/L)
Koc = organic carbon partitioning coefficient (L/kg)
foc = fraction of organic carbon (0.01 for 1% OC)
Θm = 0.3 (assumed 30% moisture of sediment by mass)
pw = 0.9982 density of water at 20˚C

Acetone SQBsed = 1.7 mg/L x [(2.4 L/kg x 0.01) + (0.3/0.9982)] = 0.552 mg/kg

d. **Response to Comment #4 of May 11, 2016 EPD Letter:** EPD concurs with the proposed revision and the response to the referenced comment is acceptable.

2. **Response to Comment #2 of January 5, 2017 EPD Letter:** Soil concentrations must be protective of groundwater to comply with cleanup standards under the Rules for Hazardous Site Response (Rules) and the VRP Act. Section 12-8-108(6) of the VRP Act provides that any cleanup standard promulgated pursuant to Code Section 12-8-93 may be used. Code Section 12-8-93 refers to the Hazardous Site Response Act (O.C.G.A §12-8-90 *et seq.*). The cleanup standards promulgated pursuant to the Hazardous Site Response Act are the Risk Reduction Standards (RRS) of Section 391-3-19-.07 of the Rules. Part of the criteria for evaluating RRS for soil involves protection of groundwater, in addition to criteria for direct contact. Section 12-8-108(5) of the VRP Act further provides that compliance with site-specific cleanup standards for soil may be based on soil concentrations for protection of groundwater criteria at an established point of exposure for groundwater defined under the VRP Act. While controls such as groundwater use restrictions can be used to restrict exposure on VRP properties, the location of the groundwater point of exposure is defined in Section 12-8-102(b)(11) of the VRP Act. Options for evaluating protection of groundwater criteria were discussed during our meeting on March 30, 2017. EPD expects that protection of groundwater criteria will be addressed in subsequent reporting.

3. **Response to Comment #3 of January 5, 2017 EPD Letter: Risk Reduction Standards**

   a. **3a and 3b:** Proposed revisions to the tables and analytical suite referenced in your responses are acceptable as long as 3c of the January 5, 2017 EPD comment is adequately addressed (see below). Please provide the updated tables referenced in your responses in the next regularly scheduled submittal.

   b. **3c:** The EPD tables provided in the January 14, 2014 email referenced in your response to this comment did not include RRS for either bis (2-chloroethyl) ether or phenol as they were not included as substances detected at the site at that time. The May 11, 2016 EPD letter included only *groundwater* Type 1 through Type 4 RRS that could be used for bis (2-chloroethyl) ether and phenol. Any RRS values to be applied to these substances in soil based on your responses referenced in Part a. of this comment should include documentation for their derivation.

4. **Response to Comment #4 of January 5, 2017 EPD Letter: Groundwater Sampling Procedures:** Arcadis is correct in stating that calculation of the volume of water standing in a well is not necessary for determining adequacy of purging efforts when using the purging method described in Section 3.2.2 of the USEPA Science and Ecosystem Support Division (SESD) guidance document SESDPROC-301-R3 (effective March 3, 2013). However, EPD usually requests that said calculations be conducted (and results recorded) by field personnel in the event the planned purging method at any single well has to be switched to the traditional multiple well volume purge method due to unforeseen field conditions.

5. **Response to Comment #5a of January 5, 2017 EPD Letter: Planned Delineation and Remedial Actions:** As indicated in the original EPD comment, historical groundwater analytical results may be used for vertical delineation of the extent of PCBs (Aroclors and congeners) and 1,1-biphenyl in soil if collected in the appropriate locations. Should Hercules wish to use said historical data, a table summarizing the data used for this purpose should be submitted with their conclusions. The area reportedly delineated by the historical groundwater data should be clearly noted/identified on the requested table and associated analytical summary figure(s). Note:

   a. Groundwater samples used for this purpose should be, or have been, collected at the soil sample locations being delineated or within approximately 100 ft hydraulically downgradient of the soil sampling locations. Therefore, since there is a significant groundwater "gap" (Dundee Canal) that hydraulically divides the eastern and western portions of the VRP properties, analytical results for groundwater samples collected east of the canal may not be used to delineate soil contamination west of the canal.

   b. Based on the information provided in the progress reports to date, it does not appear that a significant number of groundwater samples were collected and analyzed for the referenced substances.

   c. Furthermore, implementation of institutional controls to prevent unacceptable human exposure to contaminants does not relieve Hercules from the duty to delineate the extent of contamination in both soil and groundwater.

   EPD recommends that the evaluation of the soil leaching to groundwater exposure pathway requested in Comment #2 of this letter be conducted before selection of groundwater sampling locations for vertical delineation of soil contamination, as the delineation standards (Type 1 and 2 RRS) for soil contamination are likely to change as a result and comparison with soil analytical results may not require the use of groundwater analytical results for delineation.

Please provide your responses to the above comments with the next semi-annual progress report due by September 15, 2017. If you have any questions, please contact Ms. Carolyn L. Daniels, P.G. at (404) 657-8646.

Sincerely,

David Hayes
Unit Coordinator
Response and Remediation Program

c: David Wilderman, P.G., Arcadis (via email)
Johnnie Quiller, Solenis (via email)

File: 242-0236 (VRP)

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