UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8960

May 25, 2016

Ms. Tracey Duncan
Federal Facility Agreement Manager
United States Department of Energy
Portsmouth/Paducah Project Site Office
5501 Hobbs Road
Kevil, KY 42053

RE: EPA Comments: Addendum to the Final Characterization Report for Solid Waste Management Units 211-A And 211-B Volatile Organic Compound Sources for the Southwest Groundwater Plume at the U.S. Department of Energy, Paducah Gaseous Diffusion Plant (DOE/LX/07-1288&D2/A1/R1), Secondary Document, transmittal dated April 25, 2016 (PPPO-02-3444761-16)

Dear Ms. Duncan,

The U. S. Environmental Protection Agency Region 4 has reviewed the Department of Energy's (DOE) responses to Agency comments and the revised *Addendum to the Final Characterization Report for Solid Waste Management Units 211-A And 211-B Volatile Organic Compound Sources for the Southwest Groundwater Plume at the U.S. Department of Energy, Paducah Gaseous Diffusion Plant* (DOE/LX/07-1288&D2/A1/R1). Several concerns remain outstanding on this Secondary Document and EPA is not able to provide approval of the D2/A1/R1. In the alternative, EPA is providing comments as an enclosure to this letter to ensure that the issues of data quality and usability, and the uncertainty in local groundwater flow direction in the vicinity of 211-B, are considered by the DOE, KDWM, and EPA during development of subsequent Primary Documents for these SWMUs and remedial decision-making (as anticipated by Section XX (B), *Review/Comment on Draft/Final Documents – General Process for Document Review*, of the Federal Facility Agreement).

If you have any questions about this correspondence, please do not hesitate to contact me at (404) 562-8547 or via electronic mail at corkran.julie@epa.gov.

Sincerely,

Julie L. Corkran

Julie L. Corkran, Ph.D.
Federal Facility Agreement Manager
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Enclosure

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U. S. Environmental Protection Agency (EPA) Region 4
Evaluation of:

DOE Responses (April 2016) to EPA Comments (March 6, 2016) on the Addendum to the Final Characterization Report for Solid Waste Management Units 211A and 211B, Volatile Organic Compound Sources for the Southwest Groundwater Plume (DOE/LS/07-1288&D2/A1) dated December 2015 (draft Appendix H)

and

Addendum to the Final Characterization Report for Solid Waste Management Units 211 A and 211B, Volatile Organic Compound Sources for the Southwest Groundwater Plume (DOE/LX/07-1288&D2/A1/R1) Redline dated April 2016 (Final Appendix H)

Paducah Gaseous Diffusion Plant, Paducah, Kentucky
EPA ID KY8890008982

Response to EPA General Comment 1:

The DOE response only partially addresses the comment.

The quality of the data, the sufficiency of the record-keeping, and the interpretation of the records, in support of answering questions about data collection in support of data interpretation and decision-making remains a concern for EPA. The second bulleted item under General Comment 1 requested revision of Section H. 7 *(Uncertainty Evaluation)* to describe the scope and magnitude of the sample collection protocol deviation and the resulting impacts on the representativeness and usability of the VOC data. The response indicates Section H.7 has been revised to address the impact of the sample protocol (i.e., one use of a cup for VOC sample collection).

EPA notes that the draft report (D2/A1) initially asserted that *"In a few cases where the entrained sediment load was greatest, the discharged groundwater was first collected in a precleaned, stainless steel cup and then pouted in the samples vials."* In the revised (D2/A1/R1) report, the text has been changed to reflect that DOE deviated from approved sampling protocol for a single sample: 211-A-046 at 80 ft depth. EPA's review of the Geologist's logbooks does not provide defensible lines of evidence that the sample 211-A-046 at 80ft depth was the only sample for which DOE did not follow established standard operating procedures for collecting VOC water samples. Key entries from the logbooks illustrating the lack of certainty regarding how the VOC water samples were collected are summarized below:

- Borehole 046 was the first borehole advanced and sampled (June 23-24, 2015).
- On June 23, the notation for the sample at the 65 ft depth (the first depth sampled) states: *Pump screen clogged – stop pumping. Volume pumped was very small. Elect to collect sample when pumping resumes – turbidity/sediment too great at this depth to accommodate purge/sample protocol with pump.*
- EPA notes that the first sample depth from the first borehole, DOE concluded that the SOP for purging and sampling with the pump could not be followed. The notation for the 65 ft depth in 211-A-046, however, does not state how the sample was collected, just that the SOP could not be followed.
- On June 23, no notation was made in the Geologist log book regarding how the sample was collected after the borehole was advanced to 75 ft depth.
- On June 24, for the 80 ft depth in Borehole 46, the Geologist log book notes: *purged 20 gallons (total). As with previous samples, water is too turbid to sample through flow cell. Sample collected in a cup and transferred to VOA vials.*
- On June 24, for the 85 ft depth in Borehole 46, the Geologist log book notes: *sample too turbid for flow cell – collected from discharge stream of pump.*
- It is EPA's view that the sample collection notation at 85 ft depth, made just an hour after the notation for the 80ft depth, is simply short-hand for "sample too turbid to sample through flow cell – collected in a cup from discharge stream of pump and transferred to VOA vials."
- On June 24, no notations were made by field personnel (while the Geologist was at lunch) regarding turbidity or sample collection method for the 90ft depth. Upon return to the site, a notation was made only regarding purge volume and that the sample had been collected.
- On June 24, for the 95 ft depth, the Geologist log book notes: *collect sample (water is too turbid for use of flow cell) from discharge stream of pump.*
- Again, it is reasonable to conclude that his notation is simply short-hand for "sample too turbid to sample through flow cell – collected in a cup from discharge stream of pump and transferred to VOA vials."
- Despite multiple log book entries regarding high turbidity and the pump screens clogging with sediment at multiple depths at the remaining boreholes between June 24 and July 7, 2015, the Geologist logbook does not include any notations about *how* samples were collected.

Also, although reported in the logbook as turbid and noted in the revised report as having an excessive entrained sediment load, sample 211-A-046 at 80 ft depth is <u>not</u> one of the 24 (out of 42) samples that maxed out the turbidity meter in the field. Sample 211-A-046 (80ft) turbidity is reported (in the Attachment to Appendix H) at 2000 NTU while a value of 5999 is reported (footnote) as the upper limit of the range of the instrument. Furthermore, thirty-five (35) of the

42 samples collected are reported with turbidity readings greater than or equal to that of sample 211-A-046 at 80 ft depth. These thirty-five samples are from 211-A "upgradient" boreholes (48, 46, 45), 211-A "downgradient boreholes (47, 49) and the 211-B "downgradient" borehole (21) at target depth intervals ranging from 65 to 100 ft. Nevertheless, a sample is singled out by DOE in the revised report (D2/A1/R1) as the only sample for which a deviation to the SOP for purge and sample collection for VOC analysis was used.

Although DOE has revised the report (Section H.6) to advise the user that the project data have been attributed with the QUAL (qualitative) code in the Paducah OREIS, based on review of the information provided by DOE, the uncertainty regarding the sampling protocol deviations during the field work are likely to extend beyond sample 211-A-046 at 80 ft depth.

Further, DOE's text revision that the sample "*collection process was intentionally timely, requiring only a few minutes*" for sample 211-A-046 at 80 ft is not supported by any information in the logbooks that were provided for Agency review: no information was provided to support this revision to the report text. (EPA assumes that <u>all</u> sampling for VOCs is executed by field personnel in a timely fashion to reduce potential loss of the volatile target constituents to the atmosphere.)

EPA notes that the revised report states that "the investigation schedule necessitated a one-hour limit to the groundwater purge and sampling effort for most sampling intervals" and that there was "limited availability of the drill rig." The Geologist logbook indicates that a decision was made during the course of the investigation to further reduce the purge time to 50 minutes. Given DOE's statements in conference calls on 211A and 211 B that sediment interference with sampling collection had been encountered at an earlier PGPD project employing Hollow Stem Auger (HSA) drilling, the investigation schedule should have been planned to ensure sufficient time was budgeted to implement the approved Work Plan and project specific QAPP in a manner consistent with the standard operating procedures for both purge activities and sample collection to ensure representativeness and usability of the collected data (VOCs and water quality data). DOE's decision to execute multiple sampling events for more than one project and in different locations at the PGPD during a single field mobilization event is not an excuse for not budgeting adequate time, with contingencies, to ensure that data quality objectives are met for all field sampling projects. It is also important to point out that EPA and KDWM were left out of the decision making progress and were being told that SWMU 211-A/@11-B project was progressing along without being informed of time constraints and the impacts of those time constraints.

Response to EPA General Comment 3:

The DOE response only partially addresses the comment.

The response indicates text has been added to the report to briefly discuss potentiometric surface trends that were the basis for the decisions concurred upon during scoping sessions. Additionally, a map of the most recent Regional Gravel Aquifer (RGA) potentiometric surface used during the scoping session has been provided in the revised (D2/A1/R1) report. The new text and potentiometric surface map supports that the groundwater flow direction in the general location of SWMU 211-A is to the north of C-720. However, no groundwater monitoring well elevation data has been presented for locations southeast, south, or southwest of C-720 (i.e., SWMU 211-B) that would allow for triangulation of the groundwater elevation data across C-720, or other lines of evidence provided, supporting a northerly flow direction at SWMU 211-B. In addition, the plume map updates provided by DOE on a bi-annual basis indicate that the southwest plume has a westerly flow component that is not reflected in the potentiometric maps provided in the revised (D2/A1/R1) report for SWMUs 211 A and 211-B. As such, uncertainty remains regarding the groundwater flow direction at SWMU 211-B.

Response to EPA General Comment 4:

The DOE response does not adequately address the comment.

The response indicates the (VOC) analyses of the SWMUs 211-A and 211-B samples are not considered screening level data. Collection of samples from a direct push technology (DPT) system, as planned, or a hollow stem auger (HAS) system, the approved alternative, was consistent with the project Work Plan and QAPP, which was agreed to for decision making. However, since the groundwater samples were not collected in accordance with the U.S.EPA Region 4, Field Branches Quality System and Technical Procedures for Science and Ecosystem Support Division (SESD) Field Branches, the groundwater results should be considered screening level data only.