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

December 19, 2019

Mr. Brian T. Hennessey
SRS Remedial Project Manager
Infrastructure and Area Completion Division
U.S. Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

RE: EPA Comments on the Contaminant Migration Model for the A-Area Miscellaneous Rubble Pile (731-6A) Operable Unit (U), SEMS Number: 30, SRNS-RP-2018-01190, Revision 0, January 2019, Savannah River Site, Aiken, South Carolina

Dear Mr. Hennessey,

The U.S. Environmental Protection Agency, Region 4 (EPA), has reviewed the Contaminant Migration Model for the A-Area Miscellaneous Rubble Pile (731-6A) Operable Unit (U), SEMS Number: 30, SRNS-RP-2018-01190, Revision 0, January 2019. EPA comments are attached.

If you have any questions or require additional information, please contact me at (404) 562-8513.

Sincerely,

JENNIFER TUFTS
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Date: 2019.12.19 13:25:58 -05'00'

Jennifer Tufts
Remedial Project Manager
Superfund Division

ec: C.L. Bergren, SRNS-ACP
Susan Fulmer, SCDHEC

EPA Comments on the Contaminant Migration Model for the A-Area Miscellaneous Rubble Pile (731-6A) Operable Unit (U), SEMS Number: 30, SRNS-RP-2018-01190, Revision 0, January 2019, Savannah River Site, Aiken, South Carolina

I. GENERAL COMMENT

The predictive modeling results of the Vadose Zone Contaminant Migration Model Multi Layered (VZCOMML) indicate tetrachloroethylene (PCE) and trichloroethylene (TCE) would be below Maximum Contaminant Levels (MCLs) at the downgradient receptor (i.e., monitoring well located at the edge of the waste unit). However, the conclusion that the A-Area Rubble Pile (ARP) Operable Unit (OU) Trenches Area no longer pose a threat to human health and the environment is uncertain based on the following concerns:

- The VZCOMML model incorporates soil properties based on the United States Department of Agriculture (USDA) soil classification system and not according to the Unified Soil Classification System (USCS). It is noted the USDA soil classification system is based generally on particle size whereas the USCS is based on additional soil properties (i.e., plasticity and compressibility). As such, any predictive modeling based on particle size alone could produce misleading results as physical properties of the finest soil fractions depend on many factors which potentially impacts contaminant fate and transport other than particle size (e.g., plasticity). Therefore, it is not certain whether similar results would be produced if the VZCOMML incorporated the USCS soil properties rather than the USDA soil properties.

- It is not clearly understood what soil classification system and description methods were used in the field to log the soil boring MSS12SB. Additionally, it is unclear what soil classification system was utilized for or any of the previous soil borings installed at the ARP OU or for the previous vadose zone Seasonal Soil Compartment Model (SESOIL, WSRC, 2000). Furthermore, it is unclear whether the USDA soil classification and description methods incorporated in the VZCOMML were determined in the field or in the laboratory. Since soil properties are based on a particular soil classification system, failure to consistently follow standard soil classification and description methods or indiscriminately using different classification systems could result in their misuse and/or poor quality data. For example, there is a significant difference between a USCS silty clay and a USDA silty clay. Laboratory soil testing/classification results should be used for modeling purposes.

- The ARP OU hydrogeologic conceptual model (HCM) indicates once in the vadose zone, contaminants are vertically directed downwards by gravity through the vadose zone with the attenuation of the leachate controlled by properties of each of the contaminants and soils. The updated HCM is based on lithologic information obtained only from soil boring MSS12SB and resulted in five modeled layers instead of two. As such, the VZCOMML was generated based on the updated HCM using five modeled layers to simulate the vertical migration of contaminants through the vadose zone. However, it is noted MSS12SB is located approximately 80-ft and 100-ft west of the unit boundary and Trenches Area boundary, respectively. Therefore, it cannot be assumed the soil type(s) at one site is/are comparable to another site based on the origin of geologic material (or proximity). Currently, is it uncertain whether the five modeled layers based on the lithologic descriptions at MSS12SB only, are representative of lithologic soil conditions as previously described for areas directly beneath the Trenches Area.

- It is noted the third primary factor that was changed in the model considers a lower water table elevation based on more recent water table data. The text indicates the lower water table elevation creates a greater vadose zone transport distance resulting in longer travel times and increased attenuation of contaminants. Currently, no historical or recent groundwater table elevation data is presented. As such, it is not known what increase in water table elevation would need to occur to invalidate the results of the current fate and transport model. Since the mixing zone thickness would likely change as the water table elevation changes, it is not clear if

the updated remedial goals for TCE and PCE would remain effective and protective in the long-term.

Revise the Contaminant Migration Model for the A-Area Miscellaneous Rubble Pile (731-6A) Operable Unit (U), SEMS Number: 30, SRNS-RP-2018-01190, Revision 0, January 2019 (Model Report) to address these concerns to ensure the vadose zone contaminant migration model is representative of soil properties and valid for the subsurface geology located directly beneath the Trenches Area.

II. SPECIFIC COMMENTS

1. **Section 1.0 Introduction, Page 2 of 42:**

   The text states the domed 0.3 meter (1 foot) soil cover also limits infiltration, reducing the source mass flux from the ash zone to the unsaturated zone. However, according to Figure 1-3. ARP OU SVE and Vadose Zone Monitoring Well Locations, Page 7 of 42, not only is the extent/location of the soil cover shown but also the location/extent of a soil cap as defined by the black dotted line drawn around the Trenches Areas. However, the existence of a soil cap installed over the trenches area is not discussed in the text. Revise the text as appropriate to address this issue.

2. **Figure 1-2 ARP OU (731-6A) Subunits, Page 6 of 42:**

   The symbols designating the locations of RWM-6 and MS S-12SB in the figure have not been defined in the figure legend. The text indicates RWM-6 is a recovery well and MS S-12SB is a soil boring. Revise the figure legend to address this issue to ensure the purpose of RWM-6 and MS S-12SB is clearly defined and understood.

3. **Section 2.2.1 Infiltration and Surface Runoff, Page 11 of 42:**

   The text states the average annual infiltration is 43 centimeters (cm) or 17 inches (in), which is calculated by using the measured annual rainfall of 122 cm or 48 in (measured in 1991 at the Savannah River Technology Center gauging station in the A/M Area). It is not clearly understood why the 1991 annual rainfall value of 122 cm or 48 inches was utilized to calculate the average annual infiltration rate rather than more recent rainfall data. Revise the Model Report to address this issue to ensure the most appropriate annual rainfall values are utilized.

4. **Section 2.2.3 Subsurface Flow System, Page 12 of 42:**

   The text indicates the ARP is within the zone of capture of recovery well RWM-6, located approximately 15 meters (50 feet) west of ARP and adjacent to the A-014 Outfall. The text also indicates groundwater flow in the M-Area aquifer zone beneath the ARP is to the west toward the recovery well when it is actively pumping. Based on the text, the M-Area groundwater flow direction is being influenced by the actively pumping recovery well. Currently, the Model Report does not present a potentiometric surface map with flow directions prepared for the M-Area aquifer water table. Additionally, it is not known whether the pumping recovery well is also impacting and potentially facilitating contaminant migration from the vadose zone to the water table mixing zone and if this issue was considered in the updated model. Revise the Model Report to address this issue.