F.0615.029.0070

DOE-18-0057

I-22133-0032

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Remediation - Oak Ridge
761 Emory Valley Road
Oak Ridge, Tennessee 37830

January 16, 2018

Mr. John Michael Japp
DOE FFA Project Manager
P.O. Box 2001
Oak Ridge, TN 37831-8540

Dear Mr. Japp

TDEC Comment Letter
Phase 1 Field Sampling Plan for the Proposed Environmental Management Disposal Facility for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal, Oak Ridge, Tennessee DOE/OR/01-2739&D2, December 2017

The Tennessee Department of Environment and Conservation (TDEC) – Division of Remediation (DoR) reviewed the subject Field Sampling Plan (FSP) that was received on December 20, 2017 pursuant to the Federal Facility Agreement (FFA) for the Oak Ridge Reservation (ORR). The FSP presents the U.S. Department of Energy (DOE) - Oak Ridge Office of Environmental Management (OREM) plan for characterizing Site 7c pursuant to the Dispute Resolution Agreement (DRA) signed on December 7, 2017. Site 7c, also known as the Central Bear Creek Valley (CBCV) site, is the location that will be identified in the Proposed Plan for a future Environmental Management Disposal Facility (EMDF). The DRA also specifies that the official public comment period will be after data collection and analysis that confirms Site 7c remains the preferred site.

The DRA memorializes the FFA parties' agreement to resolve the dispute over the remedial investigation/feasibility study (RI/FS). The DRA states that the Proposed Plan will include a TDEC/EPA-approved FSP as an appendix and that the FSP shall reflect mutual agreement of the parties to implement data collection identified in the "Statement of Work" provided by EPA and TDEC for Site 7c. The "Statement of Work" identified in the DRA is the *Statement of Work [SOW] to Expedite Groundwater*

'18 JAN 18 PM2:24

RECEIVED
FEB 12 2018

RECEIVED FEB 01 2018

DOE IC

Characterization, Central Bear Creek Valley Site 7c transmitted by EPA to OREM through email on August 8, 2017. The e-mail transmittal, SOW, and DRA are enclosed for reference.

This letter and the comments in Attachment A present TDEC's evaluation of the completeness of the D2 FSP with respect to the DRA and the SOW. TDEC expects OREM to resolve TDEC and EPA comments in the FSP so that it may be approved and attached to the Proposed Plan. After a January 5, 2018 DRA clarification call among the principals, it was confirmed that, consistent with the signed DRA, public comment on the Proposed Plan will occur after OREM completes the data collection identified in the EPA/TDEC-approved FSP and the data are in the administrative record and available for public review.

When preparing the SOW, EPA and TDEC were tasked with documenting the minimum site-specific geologic and hydrologic characterization data that EPA and TDEC believe are needed to evaluate the suitability of CBCV Site 7c with respect to siting criteria applicable or relevant and appropriate requirements (ARARs). The SOW included the following ARARS previously identified in the July 24, 2017, letter from EPA and TDEC.

- TDEC 0400-20-11-.17(1)(h) provides that the hydrogeologic unit used for disposal shall not discharge groundwater to the surface within the disposal site.

- Toxic Substances Control Act (TSCA) 40 CFR 761.75(b)(5) provides that the landfill shall be located in an area of low to moderate relief to minimize erosion and to help prevent landslides or slumping.

- TSCA 40 CFR 761.75(b)(3) provides that the bottom of the landfill liner system or natural in-place soil barrier shall be at least 50 feet above the historical high water table, and there shall be no hydraulic connection between the site and standing or flowing surface water.

TDEC rules chapter 0400-20-11 defines "Disposal site" as *"that portion of a land disposal facility which is used for disposal of waste. It consists of disposal units and a buffer zone."*

TDEC 0400-20-11-.17(3)(h) identified in Table G-5 of the D5 version of the EMDF RI/FS states *"A buffer zone of land must be maintained between any disposal unit and the disposal boundary and beneath the disposed waste. The buffer zone shall be of adequate dimensions to carry out environmental monitoring activities specified in paragraph (4) of this rule and take mitigative measures if needed."*

SOW page 5 states *"[t]his SOW assumes that neither the disposal area nor the associated buffer zone overlies the Maynardville Limestone or the Maynardville-Nolichucky contact. If any portion of the disposal area or buffer zone overlies the Maynardville Limestone or its contact with the Nolichucky shale, additional site characterization will be required to demonstrate compliance with additional ARARs complicated by groundwater movement in a karst environment."*

The FSP identifies the outside perimeter of the landfill berms and does not identify the boundary of the buffer zone. The outside perimeter of landfill berms and buffer zone are not the same. Further, the SOW requires surface water discharge (flow) monitoring where the northern tributaries (NTs) both enter and leave the buffer zone to help quantify groundwater discharge to surface water within the disposal site. The FSP must specify how stream flow (discharge) monitoring locations relate to the buffer zone.

During the December 7, 2017 discussions leading to signing the DRA, it was recognized that it is impractical to monitor the entire 2018 wet season (January through April) at Site 7c as specified in the SOW because piezometers had not been installed. Therefore, the principals agreed that appropriate piezometers/wells from similar locations in Bear Creek Valley (BCV) would be identified and used to evaluate January and February 2018 data. OREM would install the Site 7c piezometers identified in the SOW and collect March and April 2018 data to compare with the similar BCV wells. It was also agreed that data collection will also continue at least through the Record of Decision. TDEC agreed if water level fluctuations in the piezometers installed at Site 7c are comparable to fluctuations in the piezometers/wells used for comparison, then January and February 2018 data from the comparison wells could be used to estimate January and February 2018 water levels at Site 7c. If March and April 2018 water level fluctuations are not comparable, then there will have to be additional discussion and agreement. TDEC expects OREM to identify comparable wells and ensure the wells are instrumented so that January and February water levels at Site 7c may be inferred if March and April 2018 data are found to be comparable.

As stated on page 3 of the SOW *"In order to obtain data on water level fluctuations through one wet season and to use that data to estimate historical high water table fluctuations pursuant to 40 CFR 761.75(b)(3), DOE must 1) perform continuous water-level monitoring at CBCV Site 7c piezometers, 2) identify appropriate monitoring wells/piezometers from similar locations in Bear Creek Valley that DOE will use to correlate with the CBCV Site 7c to establish historic high water levels, 3) demonstrate these wells are comparable to CBCV Site 7c piezometers, and 4) estimate historical high water table fluctuations."* As noted above, TDEC agreed that Site 7c data from March/April 2018 may

be supplemented with data from comparable locations in BCV to estimate January/February 2018 conditions at Site 7c.

Pursuant to the DRA, the *"field investigation, and EPA/TDEC's review of the results thereof, shall be conducted prior to execution of the Record of Decision (ROD) and shall be used in selecting the remedy"*. Further, the DRA specifies that the ROD will determine the final version of ARARs and to-be-considered (TBC) requirements preliminarily reflected in RI/FS Appendix G (and waivers with justification, if necessary) considering new information gathered after the Proposed Plan and all public comments received. This new information includes results of the field investigation since the DRA anticipates issuing the Proposed Plan approximately 60 days after executing the agreement.

TDEC will also use the data in independent verification of modeling referenced in DRA item 5, verifying that CERCLA criteria are met, and evaluating ARARs referenced in DRA item 6.

Questions or comments regarding the contents of this letter should be directed to Brad Stephenson at the above address or by phone at (865) 220-6587.

Sincerely

Michael Hoggan for

Randy Young
FFA Manager

Enclosures: Attachment A, TDEC Comments
Attachment B, *Statement of Work to Expedite Groundwater Characterization, Central Bear Creek Valley Site 7c,* August 8, 2017
Attachment C, Dispute Resolution Agreement, December 7, 2017

cc: John M. Japp, DOE - OREM
Dave Adler, DOE – OREM
Patricia Halsey, DOE - OREM
Carl Froede, EPA
Connie Jones, EPA
Rich Campbell, EPA
Pete Osborne, SSAB
Amy Fitzgerald, ORRCA
Ron Woody, ORRCA
Traci Cofer, ORRCA
Shari Meghreblian, TDEC

ATTACHMENT A: TDEC Comments

Document Name: *Phase 1 Field Sampling Plan for the Proposed Environmental Management Disposal Facility for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal, Oak Ridge, Tennessee (DOE/OR/01-2739&D2), December 2017*

This attachment and the accompanying letter present the Tennessee Department of Environment & Conservation's (TDEC's) evaluation of the completeness of the Field Sampling Plan (FSP) with respect to the *Draft Statement of Work [SOW] to Expedite Groundwater Characterization, Central Bear Creek Valley [CBCV] Site 7c*. The Environmental Protection Agency (EPA) and TDEC provided the SOW to the U.S. Department of Energy (DOE) - Oak Ridge Office of Environmental Management (OREM) on August 8, 2017. As part of OREM's formal dispute of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Remedial Investigation/Feasibility Study (RI/FS) for the Environmental Management Disposal Facility (EMDF), OREM requested the SOW to clarify the minimum characterization effort necessary for Site 7c. The letter and this attachment compare data collection in the FSP and the SOW with the intent of aligning timing and manner of data collection and its analysis reflecting mutual agreement of the FFA parties as expressed in the DRA.

General Comments

The following general comments present TDEC's evaluation of whether the FSP reflects "*data collection identified in the 'Statement of Work' provided by EPA and TDEC for Site 7C*" (Dispute Resolution Agreement [DRA], December 7, 2017). Each general comment summarizes a specific requirement set forth in the SOW, along with a determination of whether the D2 FSP meets the requirement.

1. **As stated in the SOW and pursuant to 40 CFR 761.75(b)(3), OREM must obtain continuous data on water level fluctuations at Site 7c during March/April 2018 and use those data along with water-level and precipitation data collected over longer periods at comparable locations in Bear Creek Valley (BCV) to estimate historical high water table fluctuations at Site 7c.**

   Revise the FSP to reflect this data collection requirement identified in the SOW (page 3).

   Section 6.1, Groundwater Evaluation says that "*monitoring will continue for at least one year to ensure seasonal high water levels are captured*". TDEC 0400-20-11-.17(4)(a) requires a preoperational monitoring program of at least 12 months. TSCA 40 CFR 761.75(b)(3) requires estimating the historical high water table. The SOW required determination of the historical high water table because the historical high water table includes both this year's

high water table and past high water tables in determining whether waivers are needed and justifiable.

The immediate concern is determining whether there would be a hydraulic connection between the site and standing or flowing surface water and, if so, whether a waiver from this TSCA siting requirement is required and justified. Another immediate concern is determining whether the hydrogeologic unit used for disposal would discharge groundwater to the surface within the disposal site and, if so, whether a waiver from this siting requirement is required and justified.

FSP Table 1 also states *"If the predicted post-construction groundwater table is above the geologic buffer, then the design elevation must be increased or a French drain or other groundwater control system must be included in the design... If the predicted post-construction groundwater elevations and flows using the* ***planned*** *French drains are insufficient to lower the groundwater table to this allowable level..."* (text bolded for emphasis). French drains as specified here would provide hydraulic connection between the site and standing or flowing surface water and would discharge groundwater to the surface within the disposal site. Use of French drains as specified here would require ARAR waivers that must be justified.

Section 6.1 says that *"EMWMF [Environmental Management Waste Management Facility] piezometer data will be used to predict groundwater elevations at the CBCV [site] by noting the magnitude of the change during wet season, and applying a similar factor to EMDF piezometer readings."* Analyses of March and April 2018 data will be required to determine whether piezometer data from other BCV locations may be comparable to Site 7c. Further, EMWMF piezometers are newly instrumented and will not characterize the historical high water table. In order to estimate historical high water levels, the FSP should specify that OREM will identify monitoring wells and piezometers in BCV which have or previously had continuous water level monitoring data; the time period such data was collected; the topographic and geologic environment for each monitoring well and piezometer; and the rationale for whether OREM considers the monitoring well or piezometer comparable with piezometers installed at Site 7c. Continuous water level monitoring intervals should be compared with annual rainfall to determine whether each data collection period related to drought, normal precipitation, or above-average rainfall. OREM should also consider making the FSP more specific. For example, it might indicate that OREM will overlap graphs from Site 7c and other BCV locations to support decisions regarding whether the locations are comparable and what constitutes a *"similar factor"*.

2. **OREM must demonstrate that BCV wells used to support an estimate of historical high water table fluctuations at Site 7c are comparable to Site 7c piezometers.**

Revise the FSP to reflect this data collection requirement identified in the SOW (page 3).

Analyses of March and April 2018 data will be required to determine whether 2018 wet season piezometer or monitoring well data in BCV may be comparable to Site 7c. This is a different question than identification of the historical high water table. Also, see discussion in General Comment 1.

The FSP must specify which wells OREM will use, including depths, screen lengths, geologic formations, and any other information needed to demonstrate that the BCV wells/piezometers are comparable to the planned locations at Site 7c.

Site 5 well pair GWM-3 appear to be located on a knob in a similar geologic environment to Site 7c. OREM monitored water levels continuously during the Site 5 phase 1 investigation and should resume monitoring at the GWM-3 well pair unless that effort is already underway.

TDEC staff are optimistic that OREM can identify comparable wells/piezometers in BCV with an adequate combination of recent continuous records to characterize short-term fluctuations and older manual measurements to characterize historical seasonal/annual fluctuations. However, OREM must demonstrate that the wells proposed for use are comparable and that it has a plan for using data from those wells along with rainfall data to help estimate historical high water table fluctuations at Site 7c.

3. **Document precipitation recorded at stations monitored by operations personnel at the Environmental Management Waste Management Facility (EMWMF).**

   The FSP meets this data collection requirement identified in the SOW (page 3). No revision is required.

   There is a statement in Table 1 that OREM will use precipitation data from EMWMF for long-term monitoring of precipitation.

4. **Collect data during drilling and after piezometer installation to understand hydraulic properties (e.g., hydraulic conductivity) relative to the lithology and water bearing/transmission zones within the soil and rock underlying the site.**

   The FSP meets this data collection requirement identified in the SOW (page 3). No revision is required.

   There are statements in Table 1 Section 6.1 indicating that OREM will collect lithologic and hydraulic conductivity data during and after piezometer installation.

5. **Demonstrate how groundwater moves through the site and discharges to the ground surface and surface water, including geotechnical characteristics of natural materials at the site (e.g., horizontal and vertical hydraulic conductivity values).**

   The FSP meets this data collection requirement identified in the SOW (page 3). No revision is required.

   There is a statement in Table 1 identifying horizontal and vertical hydraulic conductivity as decision inputs.

6. **Collect, during drilling of the borings for piezometer installation, standard penetration test (SPT) data.**

   The FSP meets this data collection requirement identified in the SOW (page 3). No revision is required.

   Tables 3 and 4 indicate that SPT data will be collected in the deeper boring at each paired piezometer location.

7. **Use split spoons and Shelby tubes (or equivalent equipment) to log and sample soils and saprolite continuously throughout the deepest boring at each paired piezometer location.**

   Revise the FSP to reflect this data collection requirement identified in the SOW (page 3).

   Tables 1, 3 and 4 indicate that residuum core samples will be collected in the deeper boring at each paired piezometer location. However, the FSP must state that soil/saprolite will be logged continuously or clarify any rationale for logging only discrete intervals.

8. **Describe the material with sufficient detail to identify lithology, chert lenses, fractures, relic bedding, moisture and other features that may bear or transmit water.**

   Revise the FSP to reflect this data collection requirement identified in the SOW (page 3).

   The FSP must specify OREM will describe all geologic materials (soil, saprolite and bedrock) sufficiently to identify lithology, chert lenses, fractures/voids, relic bedding, moisture and other features that may bear or transmit water.

9. **Select intervals for geotechnical samples (e.g., horizontal and vertical hydraulic conductivity values) based on observed characteristics.**

   Clarify how D2 FSP meets this data collection requirement identified in the SOW (page 3).

   In the D1 FSP, Table 4 indicated that geotechnical data would be gathered from geotechnical borings, test pits, and hydrogeological and seismic borings. However, some of that language has been deleted from the table, which is Table 3 in the D2 FSP.

10. **Core any bedrock drilled with detailed observations to identify, quantify, and describe areas of fracturing, bedding, dissolution and other features that may transmit water.**

    Revise the FSP to reflect this data collection requirement identified in the SOW.

    The FSP indicates that bedrock will be cored to depths of approximately at least 10 feet below the top of bedrock (Tables 1 and 3) at multiple locations (Table 4). However, the FSP must specify that the core samples will be described in detail to identify, quantify, and describe areas of fracturing, bedding, dissolution and other features that may transmit water.

11. **Screen piezometers at depths that contain groundwater, based on information and observations made during drilling.**

    Revise the FSP to reflect this data collection requirement identified in the SOW (page 3).

    The FSP indicates on page B-15 that the screen setting shall be determined based on lithology, the interception of or lack of fractures, and the location of hydrogeological unit contacts. Revise this statement to clarify that the screen setting shall be at depths where groundwater is encountered, based on the interception of water-bearing fractures and other observations made during drilling.

12. **Survey horizontal position and ground surface at each piezometer within 0.1 foot and top-of-casing elevation within 0.01 foot.**

    Revise the FSP to reflect this data collection requirement identified in the SOW (page 4).

    The FSP must include a statement indicating that a Tennessee-licensed land surveyor will survey the horizontal position and ground surface elevation at each piezometer within 0.1 foot and the top-of-casing elevation of each piezometer within 0.01 foot.

13. **Instrument each piezometer to record hydraulic head (water level), temperature, conductivity, and pH at intervals of at least every 30 minutes.**

Revise the FSP to reflect this data collection requirement identified in the SOW (page 4).

In accordance with OREM's October 4, 2017 transmittal letter for the D2 FSP, OREM did modify the frequency of continuous groundwater measurements to 30-minute intervals for groundwater levels and temperature. However, Section 6.1 of the FSP says that conductivity and pH will be measured only twice—bi-weekly for four weeks.

The October 4, 2017 transmittal letter for the D1 FSP states that OREM will measure conductivity and pH manually because of difficulties and higher cost associated with continuous monitoring of these parameters. TDEC staff believe there is a benefit to measuring these parameters on a continuous basis. Even if the data are not perfectly accurate, the rate of change in values for these parameters over relatively short time intervals can provide valuable semi-quantitative information regarding interactions among precipitation, surface water, and groundwater. Such changes cannot be characterized with daily or weekly measurements.

14. **Collect the data described above from the following locations:**
    - **GW-978/GW-979**
    - **GW-982/GW-983**
    - **GW-986/GW-987**
    - **GW-988/GW-989**
    - **GW-992/GW-993**
    - **GW-994/GW-995**
    - **GW-998/GW-999**

The FSP meets this data collection requirement identified in the SOW (page 4). No revision is required.

These locations are included in FSP tables titled *Summary of subsurface sample collection location*; *Groundwater level, location specific target depths and tests*; and *Summary of subsurface sample collection locations*. These locations are also listed in Figures 5 and 14.

15. **Estimate the buffer zone boundary which shall not overlie the karstic Maynardville Limestone or its contact with the Nolichucky Shale.**

Revise the FSP to reflect this data collection requirement identified in the SOW (page 4).

The FSP includes numerous references to the geologic buffer that would underlie the proposed landfill, but it must also present an estimated boundary for the horizontal buffer zone around the proposed facility. A horizontal buffer zone is critical to reduce the threat of contaminating groundwater in the karstic Maynardville Limestone and to facilitate the detection and remediation of contaminants released to groundwater before they reach that sensitive groundwater unit. Definition of the buffer zone boundary is also critical for satisfying several requirements presented on pages 4 and 5 of the SOW, as reiterated below.

> *"The July 20th map (attached) does not identify the boundary of the buffer zone required for monitoring and potential future corrective action. DOE must estimate the buffer zone boundary which shall not overlie the karstic Maynardville Limestone or its contact with the Nolichucky Shale. [Footnote 2: DOE must identify the Nolichucky-Maynardville contact based on field observations that do not rely on regional geologic maps. It is particularly important to identify locations where the contact underlies any portion of the site, including locations where the contact crosses streams that flow through the site/buffer.] DOE shall measure the flow of surface water using standard flumes or weirs where any stream (e.g., NT-10, D-10W, and NT-11) enters and leaves the buffer zone. For streams originating within the site/buffer area, spring discharge or stream flow shall be measured as close as possible to the spring/seep zone.... DOE must engage a Qualified Hydrologic Professional [QHP] in accordance with TDEC 0400-40-17 to walk the site area, including the buffer zone, during the wet season and identify locations of springs and seeps. For any spring or seep where it is practical, DOE must measure flow, temperature, conductivity, and pH.*
>
> *DOE must evaluate NT-10, D-10W, and NT-11 at intervals of 50 feet or less within the disposal site including buffer zone by describing stream sections, including any observed springs or seeps, and measuring temperature, conductivity, and pH....*
>
> *This SOW assumes that neither the disposal area nor the associated buffer zone overlies the Maynardville Limestone or the Maynardville-Nolichucky contact. If any portion of the disposal area or buffer zone overlies the Maynardville Limestone or its contact with the Nolichucky shale, additional site characterization will be required to demonstrate compliance with additional ARARs [Applicable or Relevant and Appropriate Requirements] complicated by groundwater movement in a karst environment."*

16. **Identify the Nolichucky-Maynardville contact based on field observations that do not rely on regional geologic maps.**

Revise the FSP to reflect this data collection requirement identified in the SOW (page 4).

The FSP includes numerous references to the Nolichucky-Maynardville contact, but it must state explicitly that the contact will be identified based on field observations rather than relying on regional geologic maps like those on Figures 2 through 6. This is important because, as stated in footnote 2 on page 4 of the SOW, TDEC expects OREM to identify locations where the Nolichucky-Maynardville contact underlies any portion of the site, including locations where the contact crosses streams that flow through the site/buffer.

Table 1 identifies that a principal study question is: *"Where is the Maynardville contact and does it underlie a buffer zone surrounding the landfill?"* Table 1 also identifies bedrock stratigraphy as a decision input for determining *"the location of the Maynardville Formation"*. However, it is not clear how OREM proposes to identify the Nolichucky-Maynardville contact based on field observations.

Section 6.1, Groundwater Evaluation, says: *"The piezometer along the southern boundary of the disposal cell berms will provide downgradient groundwater elevations and will help locate the contact with the Maynardville Limestone."* Regional geologic mapping like that shown on Figure 14 suggest that the southernmost piezometer location is not likely to intersect the Maynardville Limestone, which dips (slopes) southeastward away from that location as shown on Figure 4.

17. Measure the flow of surface water using standard flumes or weirs where any stream (e.g., NT-10, D- 10W, and NT-11) enters and leaves the buffer zone.

Revise the FSP to reflect this data collection requirement identified in the SOW (page 4).

The FSP (Table 2) states that OREM will monitor surface water flow in the lower reaches of NT-10 and NT-11, including a second location along NT-11 south of the Haul Road, and two locations in D-10W. The locations described may be acceptable depending on how OREM defines the horizontal buffer zone. However, the number and/or locations of surface water monitoring stations may need to be revised, particularly for NT-10 and NT-11, to satisfy the SOW requirement. Just like groundwater level monitoring, OREM must characterize wet-season stream conditions and continue data collection at least through the ROD.

18. Measure spring discharge or stream flow for streams originating within the site/buffer area.

Revise the FSP to reflect this data collection requirement identified in the SOW (page 4).

The FSP (Table 1) states, *"D-11E drainage will be covered by the landfill and does not require a flow evaluation."* TDEC does not agree because OREM has provided no data to indicate that groundwater discharge to D-11E will cease as a result of landfill construction. The FSP must

state that flow and discharge will be measured along D-11E (shown on Figure 14) and any springs identified during the site walkovers along D-11E. Collection of this characterization information is critical for assessing the currently assumed landfill footprint.

19. **Establish downstream gaging stations locations on the Nolichucky Shale, not the Maynardville Limestone.**

The FSP meets this data collection requirement identified in the SOW (page 4). No revision is required.

Table 2 and Section 6.2.2 state that OREM will place surface water flow measurement stations in the Nolichucky Shale outcrop areas in the lower reaches of NT-10 and NT-11.

20. **Instrument each stream gaging station to record discharge (flow), temperature, conductivity, and pH at intervals of at least every 30 minutes.**

Revise the FSP to reflect this data collection requirement identified in the SOW (page 4).

In accordance with OREM's October 4, 2017 transmittal letter for the D2 FSP, OREM did modify the frequency of continuous surface water measurements to 30-minute intervals for flow and temperature. However, Section 6.2.2 of the FSP says that conductivity and pH will be measured only twice—bi-weekly for four weeks.

The October 4, 2017 transmittal letter for the D1 FSP states that OREM will measure conductivity and pH manually because of difficulties and higher cost associated with continuous monitoring of these parameters. TDEC staff believe there is a benefit to measuring these parameters on a continuous basis. Even if the data are not perfectly accurate, the rate of change in values for these parameters over relatively short time intervals can provide valuable semi-quantitative information regarding interactions among precipitation, surface water, and groundwater. Such changes cannot be characterized with daily or weekly measurements.

21. **OREM must engage a Qualified Hydrologic Professional (QHP) in accordance with TDEC 0400-40-17 to walk the site area, including the buffer zone, during the wet season and identify locations of springs and seeps.**

Revise the FSP to reflect this data collection requirement identified in the SOW (page 4).

During the autumn of 2017, TDEC offered the services of a staff QHP to support the stream characterization, and OREM accepted the offer. Subsequently, on January 10, 2018, OREM notified TDEC by email that a QHP from Oak Ridge National Laboratory (ORNL) will support

the effort, along with a hydrogeologist with extensive experience on the ORR. This is consistent with the SOW and needs to be documented in the revised FSP.

22. **Measure flow, temperature, conductivity, and pH at each spring/seep.**

    Revise the FSP to reflect this data collection requirement identified in the SOW (page 4).

    The FSP (Sections 6.2.1 and 6.2.2) states that electrical conductivity measurements will be performed to determine the potential influence from groundwater. The FSP must clarify that OREM will measure flow, temperature, conductivity, and pH at each spring/seep in addition to every 50 feet along the streams.

23. **Evaluate NT-10, D-10W, and NT-11 at intervals of 50 feet or less within the disposal site including buffer zone by describing stream sections, including any observed springs or seeps, and measuring temperature, conductivity, and pH twice during the wet season and twice during the dry season.**

    Revise the FSP to reflect this data collection requirement identified in the SOW (page 4).

    There are statements in Table 2 and Section 6.2.1 that OREM will identify seeps, springs, and other expressions of shallow groundwater during a wet-season (December-April) site walkover.

    However, in accordance with the SOW and OREM's October 4, 2017 transmittal letter for the D1 FSP, Revise the FSP to reflect OREM's commitment to complete at least *two* site walkovers during the wet season and *two* during the dry season to describe conditions. Also, clarify in Section 6.2.1 that the site walkovers OREM plans to complete southeast of the Haul Road are *part of* (not in lieu of) the walkovers to characterize conditions along NT-10, D-10W and NT-11.

    Finally, for consistency with the SOW, delete the phrase *"as access allows and is appropriate"* or clarify its meaning in Table 2 and Section 6.2.1. TDEC staff understand short reaches of the streams are in culverts under roadways, and description/measurement locations may be adjusted accordingly.

24. **Perform additional site characterization to demonstrate compliance with additional ARARs complicated by groundwater movement in a karst environment if any portion of the disposal area or buffer zone overlies the Maynardville Limestone or its contact with the Nolichucky shale.**

    Revise the FSP to reflect this data collection requirement identified in the SOW (page 5).

As discussed in General Comment 15, the FSP must present an estimated boundary for the horizontal buffer zone around the proposed facility. The FSP must also indicate whether any portion of the proposed disposal area or buffer zone overlies the Maynardville Limestone or its contact with the Nolichucky shale. Finally, in accordance with the SOW, the FSP must acknowledge that OREM will work with TDEC and EPA to scope additional characterization to demonstrate ARARs if any portion of the disposal area or buffer zone overlies the Maynardville Limestone or its contact with the Nolichucky shale.

Specific Comments

The following specific comments present TDEC's evaluation of whether the FSP complies with the DRA dated December 7, 2017. Some comments address other issues that require clarification or correction.

1. **Section 1 Introduction:** *"This Field Sampling Plan identifies the initial site characterization activities (Phase 1) that have been agreed to by the FFA parties to be included in the Administrative Record prior to the public comment period on the preferred EMDF alternative. Additional investigations will be conducted in the future.... Longer-term monitoring of groundwater and surface water...are not within the scope of this Field Sampling Plan."*

Revise the FSP to clarify how OREM will comply with the following agreement identified in the DRA (item 3):

> *"The FSP shall reflect mutual agreement of the parties to implement data collection identified in the "Statement of Work" provided by EPA and TDEC for Site 7C. The results and analysis of the field investigation in accordance with the FSP shall be included in the administrative record and the Proposed Plan public comment period shall be provided thereafter. This field investigation and EPA/TDEC's review of the results thereof, shall be conducted prior to execution of the Record of Decision (ROD) and shall be used in selecting the remedy."*

The FSP proposes to implement only a very limited *"initial"* characterization effort. It does not explain how OREM will fully implement data collection identified in the SOW to comply with the agreement.

2. **Section 2.3.2 CBCV Preliminary Investigation:** Revision of the section title from "Initial Investigation" in the D1 to "Preliminary Investigation" in the D2 is not consistent with the text inserted in Section 1: *"This Field Sampling Plan identifies the initial site characterization activities (Phase 1)..."*. What distinction is made by changing *"Initial"* to *"Preliminary"*? Regardless, revise the FSP to clarify how OREM will comply with the DRA if this FSP only proposes to implement an *"initial"* or *"preliminary"* characterization effort.

3. **Table 1 DQO Summary for Groundwater Data Acquisition:** *"If the predicted post-construction groundwater table is above the geologic buffer, then the design elevation must be increased or a French drain or other groundwater control system must be included in the design."*

It has not been demonstrated that the site would meet CERCLA threshold criteria, if the predicted post-construction groundwater table requires French drains to lower the water table below the geologic buffer.

4. **Table 1 DQO Summary for Groundwater Data Acquisition:** *"Locations of new water level measurement locations are shown in Fig. 14."*

Locations of existing water-level measurement locations should also be shown on a map. As noted by an OREM representative on December 12, 2017, the FSP must state clearly how data will be evaluated. OREM's use of water-level data from existing wells/piezometers in BCV will be critical to the evaluation.

5. **Section 5 Investigation Schedule/Approach:** *"However, the following sequence is anticipated for Phase 1 work...."*

The schedule in Section 5 of the FSP indicates that data collection will be limited to a period of four weeks or less at the end of the 2017-2018 winter wet season. This is not consistent with the SOW and the DRA. Multiple tasks are scheduled very generally as *"Spring 2018,"* indicating that OREM will collect little or no data during the winter wet-season. Revise the FSP to explain how OREM will comply with the DRA and SOW.

6. **Section 5 Investigation Schedule/Approach:** *"Monitoring (following piezometer installation) for 4 weeks".*

Data collection limited to a period of four weeks or less at/following the end of the 2017-2018 winter wet season is not consistent with the SOW and the DRA. Revise the FSP to comply with the DRA and SOW.

7. **Section 6.1 Groundwater Evaluation:** *"Piezometers are not needed near the main channels for NT-11 and D-10W because these are groundwater discharge locations and define the groundwater elevation."*

Delete this sentence, which adds no value to the FSP. Although these TDEC-requested locations were not included in the SOW, the original rationale for these locations was to evaluate groundwater gradients beneath the proposed landfill footprint adjacent to the streams—not to define groundwater elevations at the streams.

8. **Section 6.1 Groundwater Evaluation:** *"Groundwater elevation and temperature data will be initially collected by using downhole monitors placed in each piezometer. Data will be collected every 30 minutes and downloaded biweekly during this initial phase to obtain one month of data. In addition, pH and conductivity measurements will be collected on a bi-weekly basis from the piezometers. The initial phase (Phase 1) of site characterization includes 4 weeks of data collection."*

Data collection limited to a period of one month at the end of the 2017-2018 winter wet season is not consistent with the SOW and the DRA. Revise the FSP to comply with the DRA and SOW, including the SOW requirement to also instrument each piezometer to record conductivity and pH at intervals of at least every 30 minutes, not twice (bi-weekly for four weeks).

9. **Section 6.1 Groundwater Evaluation:** *"Groundwater elevations determined from depth-to-water measurements will be used to (1) estimate the groundwater surface elevations across the entire footprint of EMDF (and immediate areas upgradient/downgradient), and (2) assess and design the difference between the water table and the proposed geobuffer beneath all disposal cells."*

In accordance with the SOW and 40 CFR 761.75(b)(3), revise the FSP to clarify that decisions are based on the historical high water table. This parameter may be estimated by comparing to longer records throughout the valley, but it cannot be developed only from a limited set of depth-to-water measurements at Site 7c.

10. **Section 6.2.2 Surface Water Flow Measurements:** *"In addition, pH and conductivity measurements will be collected on a bi-weekly basis. The initial phase of characterization (Phase 1) will consist of the first 4 weeks of flow measurements."*

Data collection limited to a period of one month at the end of the 2017-2018 winter wet season is not consistent with the SOW and the DRA. Revise the FSP to comply with the DRA and SOW, including the SOW requirement to also instrument each stream gaging location to record conductivity and pH at intervals of at least every 30 minutes, not twice (bi-weekly for four weeks).

Further, the SOW includes surface water discharge (flow) monitoring where the northern tributaries (NTs) enter and leave the buffer zone to help quantify groundwater discharge to surface water within the disposal site. The FSP must specify how stream flow (discharge) monitoring locations relate to the buffer zone.

11. **Section 9 Data Reporting:** *"Up to 4 weeks of data will be considered part of the Phase 1 data collection to be provided prior to the public comment period."*

Data collection limited to a period of one month at the end of the 2017-2018 winter wet season is not consistent with the SOW and the DRA. Revise the FSP to comply with the DRA and SOW.

12. **Section 9 Data Reporting:** *"Up to 4 weeks of surface water data will be considered part of the Phase 1 data collection to be provided prior to the public comment period."*

Data collection limited to a period of one month at the end of the 2017-2018 winter wet season is not consistent with the SOW and the DRA. Revise the FSP to comply with the DRA and SOW.

13. **Page A-9, Section A.1 Introduction:** *"The Phase 1 approach is provided in the attached FSP."*

Delete this sentence because there is no FSP attached. The quoted statement is made in an *attachment to the FSP*. Moreover, the FSP indicates that the QAPP also applies to unspecified future work phases that are not described in the FSP.

14. **Page B-17, Section B.3 Hydrogeologic Investigation:** *"Downhole monitors will be placed in each piezometer and will collect groundwater level and temperature data every 30 minutes. Data will be downloaded quarterly and groundwater elevations in the well points will be obtained quarterly. In addition, pH and conductivity measurements will be collected on a bi-weekly basis from each piezometer."*

The phrase *"groundwater elevations in the well points will be obtained quarterly"* appears to contradict the previous sentence which states that *"monitors...will collect groundwater level and temperature data every 30 minutes"*. Clarify if this means that manual measurements will be made quarterly in addition to the continuous measurements at 30-minute intervals. Alternatively, the reference to *"well points"* may be a relic of planned monitoring locations that OREM removed in revising the FSP to include only the minimum work identified in the SOW.

Based on the importance of the planned characterization data, OREM should revise the FSP to indicate that data will be downloaded at least every two weeks so that problems like those encountered with recent (November 2017) continuous water level monitoring at EMWMF can be corrected in a timely manner.

15. **Page B-19, Section B.4 Surface Water Flow Measurement:** *"In addition, pH and conductivity measurements will be collected on a bi-weekly basis at the surface water flumes."*

Data collection limited to a period of one month at the end of the 2017-2018 winter wet season is not consistent with the SOW and the DRA. Revise the FSP to comply with the DRA and SOW, including the SOW requirement to instrument each stream gaging location to record

conductivity and pH at intervals of at least every 30 minutes, not twice (bi-weekly for four weeks).

16. **Page B-19, Section B.4 Surface Water Flow Measurement:** *"The flumes will be monitored on an every 30 minute basis, with data downloaded at least quarterly..."*

Based on the importance of the planned characterization data, OREM should revise the FSP to indicate that data will be downloaded at least every two weeks so that problems can be corrected in a timely manner.

ATTACHMENT B: *Statement of Work to Expedite Groundwater Characterization, Central Bear Creek Valley Site 7c* (August 8, 2017)

From: Campbell, Richard
Sent: Tuesday, August 8, 2017 10:31 AM
To: Blevins, John <john.blevins@orem.doe.gov>; Henry, Brian <Brian.Henry@orem.doe.gov>
Cc: Froede, Carl <Froede.Carl@epa.gov>; Chris P. Thompson (Chris.P.Thompson@tn.gov) (Chris.P.Thompson@tn.gov) <Chris.P.Thompson@tn.gov>; Andy Binford <Andy.Binford@tn.gov>
Subject: Statement of Work for Site 7c Characterization

John/Brian – attached is a draft Statement of work that was jointly developed by EPA and TDEC. Please look it over and provide any feedback you have. We are open to participating in a conference call to discuss.

Richard Campbell, PE
Chief, Restoration & DOE Coordination Section
US EPA Region 4
Office: (404) 562-8825
Cell: (404) 769-2611

Environmental Protection Agency
Tennessee Department of Environment and Conservation

STATEMENT OF WORK

To Expedite Groundwater Characterization
Central Bear Creek Valley Site 7c

August 8, 2017

BACKGROUND

The lack of site-specific characterization for the Department of Energy (DOE) proposed Environmental Management Disposal Facility (EMDF), particularly for the Central Bear Creek Valley (CBCV) Site (Site 7c), is one of the primary reasons that the Environmental Protection Agency (EPA) and the Tennessee Department of Environment and Conservation (TDEC) cannot approve DOE's draft Remedial Investigation/Feasibility Study (RI/FS) report. Site-specific geologic/hydrologic data are needed to determine the long-term protection of human health and the environment from future release.

As part of the formal dispute resolution process, the Senior Executive Committee (SEC) met on July 27, 2017, and tasked EPA and TDEC personnel with developing this statement of work (SOW) to describe the minimum site-specific geologic and hydrologic characterization data that DOE must collect to evaluate the suitability of CBCV Site 7c with respect to siting criteria applicable or relevant and appropriate requirements (ARARs). As required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), DOE's RI/FS must demonstrate that the proposed EMDF will meet the threshold criteria of protecting human health and the environment and complying with—or justifying site-specific waivers of—federal and state ARARs. Specifically, DOE must demonstrate compliance with or justify waivers for the following ARARs, which are identified in the July 24, 2017, letter from EPA and TDEC.

- TDEC 0400-20-11-.17(1)(h) provides that the hydrogeologic unit used for disposal shall not discharge groundwater to the surface within the disposal site.
- Toxic Substances Control Act (TSCA) 40 CFR 761.75(b)(5) provides that the landfill shall be located in an area of low to moderate relief to minimize erosion and to help prevent landslides or slumping.
- TSCA 40 CFR 761.75(b)(3) provides that the bottom of the landfill liner system or natural in-place soil barrier shall be at least 50 feet above the historical high water table, and there shall be no hydraulic connection between the site and standing or flowing surface water[1].

The work described herein balances the data collection needed to evaluate ARAR compliance and/or waiver requests with DOE's desire to expedite approval of a tri-party CERCLA RI/FS and Proposed Plan. Additionally, this document provides an outline for data collection, analysis, reporting, and scheduling that should allow DOE to expedite characterization of CBCV Site 7c; provide modeling input values; and produce a CERCLA Proposed Plan for public review and comment in Fiscal Year (FY) 2018. This investigation's purpose is to determine whether several ARARs are met and to provide site-specific data to develop and evaluate an ARAR waiver(s). DOE will need to collect additional data to complete the design of a protective mixed-waste landfill in Bear Creek Valley.

DATA NEEDS

Modeling to assess the protectiveness of the proposed mixed-waste landfill must be supported by site-specific information. Consideration of the necessary field work specified in this SOW is based on DOE's draft Field Sampling Plan map dated July 20, 2017, that was distributed at the project team meeting on July 26, 2017. This map shows the proposed outside berm perimeter at CBCV Site 7c and is

[1] This siting requirement must also be consistent with EPA/540/G-90/007 (Guidance on Remedial Actions for Superfund Sites with PCB Contamination, August 1990) and any waiver justification.

based on data quality objectives that DOE scoped collaboratively with EPA and TDEC. TDEC annotated the attached copy of the map to illustrate the groundwater SOW described herein.

Collaborative scoping efforts defined a process for using field measurements to determine the water table depths/elevations and to support evaluation of potential changes in the water table configuration following placement of the landfill liner. Field measurements must also provide for determination of whether DOE would propose the use of an underdrain or other drainage feature to lower the water table. Scoping discussions focused on installation of pairs of piezometers to understand groundwater levels and vertical hydraulic gradients between shallow and deep intervals. Specifically, at the scoping meeting DOE proposed that the shallow interval is not expected to dry up after placement of the liner at locations where an upward hydraulic gradient exists or there is no dry zone between the screened intervals of the shallow and deep intervals.

In order to obtain data on water level fluctuations through one wet season and to use that data to estimate historical high water table fluctuations pursuant to 40 CFR 761.75(b)(3), DOE must 1) perform continuous water-level monitoring at CBCV Site 7c piezometers, 2) identify appropriate monitoring wells/piezometers from similar locations in Bear Creek Valley that DOE will use to correlate with the CBCV Site 7c to establish historic high water levels, 3) demonstrate these wells are comparable to CBCV Site 7c piezometers, and 4) estimate historical high water table fluctuations. DOE shall document precipitation recorded at stations monitored by operations personnel at the Environmental Management Waste Management Facility (EMWMF).

In an effort to understand groundwater levels and vertical gradients across CBCV Site 7c, DOE must install at least a subset of the previously scoped piezometer pairs (identified in Attachment figure) to develop a profile across the site. Data will be collected during drilling and after piezometer installation to understand hydraulic properties (e.g., hydraulic conductivity) relative to the lithology and water bearing/transmission zones within the soil and rock underlying the site. Data must be sufficient to demonstrate how groundwater moves through the site and discharges to the ground surface and surface water, including geotechnical characteristics of natural materials at the site (e.g., horizontal and vertical hydraulic conductivity values).

DOE shall perform the following characterization during drilling the boreholes for piezometer installation to better understand properties at the site and to support modeling. This type of data is also needed for remedial design. It is DOE's option as to whether DOE collects remedial design data with these borings or installs additional future borings to collect data for remedial design. DOE shall detail this Phase I investigation in the Field Sampling Plan and shall clearly state whether DOE elects to collect this information as part of this investigation or in the future during a remedial design investigation. During drilling of the borings for piezometer installation, DOE shall collect standard penetration test (SPT) data and use split spoons and Shelby tubes (or equivalent equipment) to log and sample soils and saprolite continuously throughout the deepest boring at each paired piezometer location. A geologist, soil scientist or engineer must describe the material with sufficient detail to identify lithology, chert lenses, fractures, relic bedding, moisture and other features that may bear or transmit water. Appropriate intervals for geotechnical samples shall be based on observed characteristics. If bedrock is drilled, the bedrock shall also be cored with detailed observations to identify, quantify, and describe areas of fracturing, bedding, dissolution and other features that may transmit water.

Piezometers shall be screened at depths that contain groundwater, based on information and observations made during drilling. Following piezometer installation, the horizontal position and ground

surface at each location shall be surveyed within 0.1 foot, and the top-of-casing elevation shall be surveyed within 0.01 foot. DOE shall instrument each piezometer to record hydraulic head (water level), temperature, conductivity, and pH at intervals of at least every 30 minutes.

At a minimum DOE must collect the data described above from seven (7) of the approximately 24 locations planned as illustrated on the attached July 20th map. These locations are listed below from the uphill end of the proposed site to the downhill end.

Piezometers	Rationale	Comment
GW-978/ GW-979	Upgradient edge of site in saddle that partially separates the site from Pine Ridge	Edge of proposed perimeter berm
GW-982/ GW-983	Atop a knob (hill) that may have high groundwater levels, per the D5 RI/FS report	D5 Figure 7-1 indicates the pre-construction water table may intersect the facility
GW-986/ GW-987	Within a valley that partially bisects the knob within the heart of the site	
GW-988/ GW-989	Atop the knob that may have high groundwater levels, as suggested in the D5 RI/FS report	Setting is similar to GW-982/GW-983, but this location is further away from Pine Ridge
GW-994/ GW-995	At downhill end of the knob within the heart of the site	
GW-998/ GW-999	Near the downhill end of the site	Map suggests this location lies within the Nolichucky Shale less than 100 feet from its contact with the karstic Maynardville Limestone
GW-992/ GW-993	Along stream D-10W where field observations suggest potential groundwater discharge	Off the cross-section near D-10W

The July 20th map (attached) does not identify the boundary of the buffer zone required for monitoring and potential future corrective action. DOE must estimate the buffer zone boundary which shall not overlie the karstic Maynardville Limestone or its contact with the Nolichucky Shale[2]. DOE shall measure the flow of surface water using standard flumes or weirs where any stream (e.g., NT-10, D-10W, and NT-11) enters and leaves the buffer zone. For streams originating within the site/buffer area, spring discharge or stream flow shall be measured as close as possible to the spring/seep zone. In order to measure the entire flow, each device must be constructed deep enough in the channel to minimize the flow of water under or around it. The downstream locations must be on the Nolichucky Shale, not the Maynardville Limestone. DOE shall instrument each stream gaging station to record discharge (flow), temperature, conductivity, and pH at intervals of at least every 30 minutes.

DOE must engage a Qualified Hydrologic Professional in accordance with TDEC 0400-40-17 to walk the site area, including the buffer zone, during the wet season and identify locations of springs and seeps. For any spring or seep where it is practical, DOE must measure flow, temperature, conductivity, and pH.

DOE must evaluate NT-10, D-10W, and NT-11 at intervals of 50 feet or less within the disposal site including buffer zone by describing stream sections, including any observed springs or seeps, and measuring temperature, conductivity, and pH. This evaluation should be performed twice during the wet

[2] DOE must identify the Nolichucky-Maynardville contact based on field observations that do not rely on regional geologic maps. It is particularly important to identify locations where the contact underlies any portion of the site, including locations where the contact crosses streams that flow through the site/buffer.

season and twice during the dry season. Dry season evaluation may be performed during the fall of 2017 to prevent extending the schedule.

This SOW assumes that neither the disposal area nor the associated buffer zone overlies the Maynardville Limestone or the Maynardville-Nolichucky contact. If any portion of the disposal area or buffer zone overlies the Maynardville Limestone or its contact with the Nolichucky shale, additional site characterization will be required to demonstrate compliance with additional ARARs complicated by groundwater movement in a karst environment.

DOE shall perform the field work consistent with EPA guidance, including the Uniform Policy for Quality Assurance Project Plans (Office of Solid Waste and Emergency Response [OSWER] Directive 9272.0-17, dated June 7, 2005).

DATA EVALUATION

Site-specific data must be integrated into modeling used to support ARAR waiver requests, develop waste acceptance criteria, and assess long-term protectiveness of human health and the environment—a CERCLA threshold criterion. For example, the determination of protectiveness and waste acceptance criteria development would incorporate site-specific data in the evaluation of 1) future risks to the public and downstream water resources and users, including fishing and people consuming fish and 2) the cumulative dose, risk, and toxicity (non-carcinogenic effects) impacts of the proposed EMDF (including all underdrains or drainage features) with existing/future sources of contamination in Bear Creek Valley.

If DOE collects any additional characterization or design information beyond the minimum effort identified in this SOW, DOE must also include those data in the evaluation.

The SEC agreed that DOE will perform modeling for CBCV Site 7c and that TDEC will independently verify that CERCLA requirements are met. Such independent verification will be completed for any modeling conducted by DOE which is used to make EMDF decisions pursuant to CERCLA. EPA and TDEC encourage DOE to schedule tri-party consultations as needed to resolve questions and data gaps that may arise during data evaluation and modeling.

REPORTING

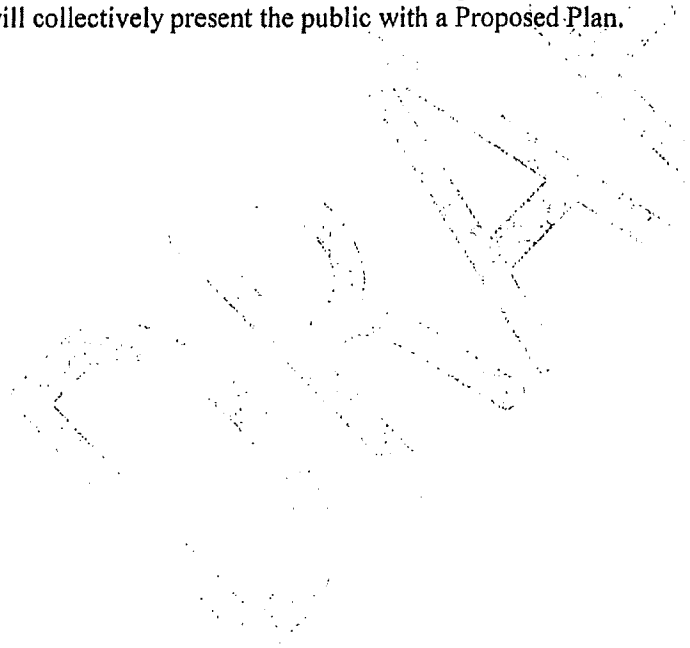
DOE shall prepare and submit a report of findings to EPA and TDEC following the wet season. This information will be used to demonstrate in the RI/FS that CBCV Site 7c is a viable location for the EMDF disposal facility (i.e., that CBCV Site 7c meets ARARs or there is reasonable expectation for waivers for ARARs that the site does not meet). The report of findings shall identify any ARAR(s) that site characterization indicates would not be met and provide justification for any needed waiver(s).

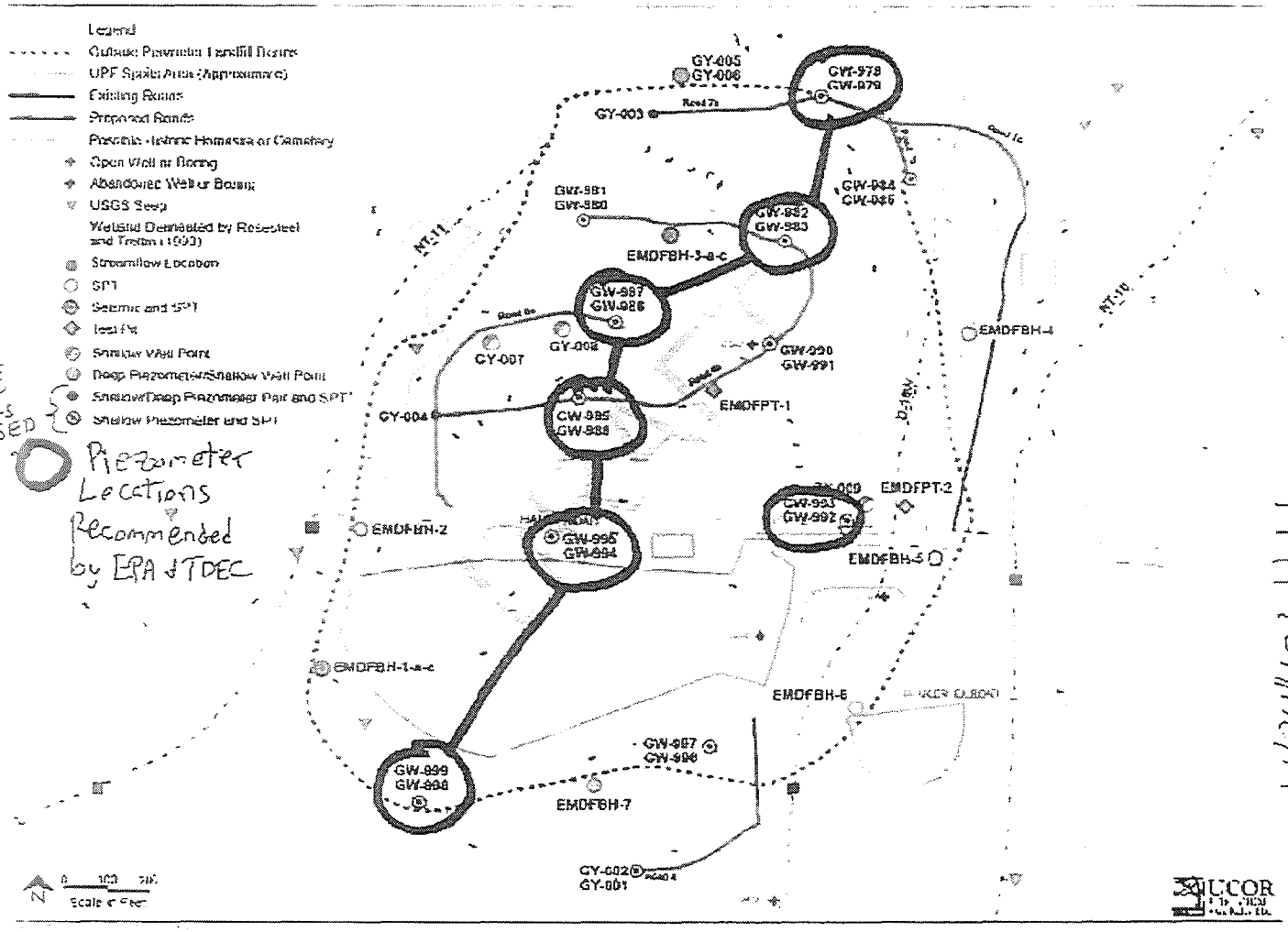
Upon approval by EPA and TDEC, the report of findings, resolving any EPA and TDEC comments, will be appended to the D5 RI/FS along with the amended ARARs table and any demonstration or process needed to support ARAR waiver requests. Upon regulatory approval of the amended D5 RI/FS, DOE, EPA, and TDEC will collectively present the public with a Proposed Plan that includes, and is not limited to: 1) wet season site conditions, 2) site-specific groundwater elevation/fluctuation information including comparison with other areas to estimate historical high water table, 3) justification for ARAR waivers, 4) site-specific data to inform waste acceptance criteria modeling, and 5) the process and schedule for developing waste acceptance criteria and compliance processes including additional public participation on what is proposed to be disposed.

Following submittal of the report of findings and approval of the amended RI/FS report, EPA and TDEC expect that DOE will continue collecting groundwater data continuously throughout all seasons and that DOE will include data collected over at least one year in the remedial design report. The additional data will establish a longer-term trend of groundwater elevation fluctuation and better define the required position of the geologic buffer. It may also be used to refine the model(s) used to develop protective waste acceptance criteria. Site-specific remedial design characterization (not addressed by this document) can then proceed following approval of the Record of Decision.

SCHEDULE

DOE shall provide a Field Sampling Plan consistent with this Statement of Work for EPA and TDEC review and shall resolve EPA and TDEC comments. The Field Sampling Plan shall include a schedule of activities necessary to collect groundwater data during the January-April portion of the FY2018 wet season and anticipated dates for the delivery of the report of findings to EPA and TDEC for regulatory review. As stated above, upon approval by EPA and TDEC, the report of findings, resolving any EPA and TDEC comments, will be appended to the D5 RI/FS along with the amended ARARs table and any demonstration or process needed to support ARAR waiver requests. Upon regulatory approval of the appended D5 RI/FS, DOE will submit a draft Proposed Plan to EPA/TDEC and the DOE, EPA, and TDEC will collectively present the public with a Proposed Plan.





FER DOE SYMBOLS REVERSED

Piezometer Locations Recommended by EPA & TDEC

Attachment 1

ATTACHMENT C: *Dispute Resolution Agreement* (December 7, 2017)

Dispute Resolution Agreement

This Formal Dispute Resolution Agreement memorializes the Federal Facility Agreement (FFA) parties' agreement regarding the *Remedial Investigation/Feasibility Study (RI/FS) for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Waste Disposal for Oak Ridge Reservation Waste Disposal Oak Ridge, Tennessee (DOE/OR/01-2535).* The US Department of Energy initiated a formal FFA dispute with the objective of moving the CERCLA process forward. The Senior Executive Committee has agreed to resolve this dispute as stated below.

Issues Discussed:

The US Department of Energy (DOE), the US Environmental Protection Agency (EPA), and the State of Tennessee's Department of Environment and Conservation (TDEC) dispute discussions eventually focused on:

- Site Characterization
- Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBCs).
- Modeling used to develop preliminary Waste Acceptance Criteria (WAC).

Resolution:

The Parties agree that:

1. Subject to the terms and conditions of this agreement, the Parties agree to give their best efforts to work jointly to issue a Proposed Plan within approximately 60 days of executing this agreement.

2. The Proposed Plan will identify Central Bear Creek Valley (Site 7C) as the preferred location for onsite disposal of CERCLA mixed low level waste on the Oak Ridge Reservation.

3. The Proposed Plan will include a TDEC/EPA approved Field Sampling Plan (FSP) as an appendix. The FSP shall reflect mutual agreement of the parties to implement data collection identified in the "Statement of Work" provided by EPA and TDEC for Site 7C. The results and analysis of the field investigation in accordance with the FSP shall be included in the administrative record and the Proposed Plan public comment period shall be provided thereafter. This field investigation, and EPA/TDEC's review of the results thereof, shall be conducted prior to execution of the Record of Decision (ROD) and shall be used in selecting the remedy.

4. Per DOE Order 435.1, DOE will issue a preliminary Disposal Authorization Statement for onsite disposal of CERCLA mixed low level waste on the Oak Ridge Reservation prior to signing the ROD. DOE issued a letter to EPA and TDEC dated July 7, 2016 concerning "Response to Action from Environmental Program Council Meeting on May 24, 2016, Regarding Compliance with U.S. Department of Energy Order 435.1 for a New Onsite Disposal Facility." That letter stands and is incorporated by reference into this dispute resolution agreement.

5. DOE shall provide funding to TDEC for FFA related oversight activities such as independent verification of modeling through a $250,000 grant.

6. The attached RI/FS Appendix G preliminarily reflects the ARARs and TBCs. The ROD will determine the final version of Appendix G (and waivers with justification, if necessary) considering new information gathered after the Proposed Plan and all public comment received. Appendix G does not currently reflect agreement regarding DOE Order and Manual TBCs as citations, however the parties will resolve this issue prior to signature of the ROD

John A. Mullis II
Manager
Oak Ridge Office of Environmental Management

12/07/2017
Date

Onis "Trey" Glenn, III
Regional Administrator
U.S. Environmental Protection Agency, Region 4

12/7/17
Date

Robert J. Martineau, Jr.
Commissioner
Tennessee Department of Environment and Conservation

Dec. 7, 2017
Date