From:	Mayton, Dennis H.
To:	Brad Stephenson; Froede, Carl
Cc:	Maki, Mark (CONTR); Primrose, Annette L; Linton, Jennifer; Petrie, Roger; Randy Young
Subject:	[EXTERNAL] Responses to TDEC comments on the EMDF Baseline Monitoring Plan for Groundwater and Surface Water
Date:	Monday, August 14, 2023 10:17:23
Attachments:	B85_EM_DISP_FACILITY_R3.pdf Baseline GW and SW FSP D2 TDEC RTC 8-14-23.pdf

Brad and Carl,

Attached are the EMDF Baseline Monitoring Plan RTCs for discussion this Thursday along with the revised figure requested.

The figure was revised to add the sampling location at the confluence of NT-11 and Bear Creek.

Thank you,

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Comment Resolution Form

Document Number: DOE/OR/01-2812&D2	**Document Title:** *Field Sampling Plan for Baseline Groundwater and Surface Water Characterization at the Proposed Environmental Management Disposal Facility, Oak Ridge, Tennessee*	
Name of Reviewer: Randy Young	**Organization:** TDEC	**Date Comments Transmitted:** 10-21-2022 & 04-21-2023

Comment No.	Sect/ Page	Comment	Response
1	Sect. 2.6 pg 7 2nd para and 1st bullet	In compliance with TDEC 0400-40-03-.05(8), revise the text to state threshold/evaluation values for non-naturally-occurring COCs will be based on "sufficiently sensitive" analytical methods with quantitation limits low enough to detect and measure constituents at, or below, applicable water quality criteria limits. Revise Table 3 and corresponding text on pages 17 and 25 accordingly.	~~Clarification provided. As noted in TDEC 0400-40-03-.05(8), "There are cases in which the in-stream criteria as established by this rule are less than current chemical technological capabilities for analytical detection. In instances where permit limits established through implementation of these criteria are below analytical capabilities, compliance with those limits will be determined using the following reporting limits, unless in specific cases other reporting limits are demonstrated to be the best achievable because of the particular nature of the wastewater being analyzed." In these cases, the applicable reporting limit is used. Table 3 (now Table 2) was revised to ensure the reporting limits that have changed since the original issue of this document are incorporated.~~ **Revised response based on TDEC 4/21/23 comments**: Disagree. Using an analytical method low enough to detect constituents at or below the water quality criteria limit is only one option for meeting the sufficiently sensitive requirement in the regulations. Under the third option in the regulations the lowest minimum level of all approved methods in 40 Code of Federal Regulations 136 can be used to also meet the sufficiently sensitive requirement. For PCBs, Method 1668 A-C is currently not listed as an approved method under 40 Code of Federal Regulations 136. The current polychlorinated biphenyl analytical method (U.S. Environmental Protection Agency Method 608) meets the sufficiently sensitive requirement in Tennessee Department of Environment and Conservation 0400-40-03-.05(8)

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		Additional TDEC comment (4/21/23): a) Clarify the source of the statement cited in the response; it does not appear in the current version TDEC 0400-40-03-.05(8), dated September 2019. If the source of the statement can be cited accurately and if the FFA parties agree, it should be added as an Applicable or Relevant and Appropriate Requirement (ARAR) in the Environmental Management Disposal Facility(EMDF) ROD. b) Regardless, the response does not resolve the comment, nor does it acknowledge the requirement to base threshold/evaluation values on "sufficiently sensitive" analytical methods with quantitation limits low enough to detect and measure constituents at, or below, applicable water quality criteria limits. c) In lieu of permit limits, DOE will establish substantively equivalent wastewater discharge limits for EMDF. Which in-stream [ambient water quality (AWQC)] criteria are less than current chemical technological capabilities for analytical detection? In other words, for which chemicals is DOE proposing to use applicable reporting limits? TDEC requests revision of Table 2 (errata pages) to identify these chemicals.	**Response to additional TDEC comment (4/21/23)** a) See revised response to this comment b) See revised response to this comment c) See revised response to this comment
2	Sect. 2.6 pg 7 last para	Revise the text to explain how results are determined to be outliers. If the procedure is documented in another plan, cite that document. **Additional TDEC comment (4/21/23):** a) The response is acceptable for groundwater, but it is unclear whether and how the response and associated text in Section 2.6 may apply to surface water.	Agree. Because of the similarities in the EMWMF and EMDF hydrogeological setting, the EMWMF baseline data will be used for comparison with EMDF data to determine if there is a potential outlier and if additional sampling is warranted to verify whether specific results are potential outliers. This comparison will continue to be used until sufficient data are available to use solely EMDF data. **Response to additional TDEC comment (4/21/23)** a) Agree. The four data points for each analyte at each surface water sampling location will be qualitatively evaluated to determine the likelihood of outliers. If an outlier is suspected, then additional evaluation will

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			be performed and results discussed with the project team prior to including in the Baseline Characterization Report.
		b) The BCR should also clarify how/when it was determined there are sufficient EMDF baseline data to discontinue use of EMWMF data. c) The BCR should also clarify the relevance of outliers in a baseline data set.	b) and c) Agree. The Baseline Characterization Report will contain the rationale used to discontinue use of EMWMF data and the rationale for including outliers in the baseline data set if these are used.
3	Sect. 2.7 pg 7 last para	For clarity, change ... *downstream from the creek headwaters... to ...downstream from the Bear Creek headwaters....* **Additional TDEC comment (4/21/23):** Comment resolved; no further response required.	Agree. Text revised as suggested.
4	Fig. 3 pg 8	a. As acknowledged on page 4 and consistent with various DOE publications, a component of EMDF groundwater flow likely moves toward the west (grid direction) or southwest (true direction) along the geologic strike of the fractured bedrock and saprolite. TDEC expects the future detection monitoring well network will include at least three shallow/deep well pairs along the western/southwestern landfill boundary. Therefore, TDEC recommends another shallow/deep well pair in the baseline monitoring network near the northwestern/western corner of the landfill footprint-Le., uphill from the planned location of GY-033/034. **Additional TDEC comment (4/21/23):** Comment unresolved. TDEC urges DOE to plan toward a RCRA-compliant detection monitoring network that avoids delays in finalizing design documents and initiating landfill operations. Toward that end, TDEC supports consideration of baseline well locations that maximize their cost-effective reuse during future detection and closure monitoring programs, where possible. b. Are any of the existing site characterization piezometers-not	a. Clarification provided. Consideration of detection monitoring wells will be deferred until the detection monitoring network is established to avoid interference with landfill construction activities. **Response to additional TDEC comment (4/21/23)** Agree. The baseline well locations were intended to be reused as part of the future detection monitoring program. They do not represent the entire detection monitoring network that will be established during the final landfill design. b. Clarification provided. The site characterization

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		shown on the map suitable for baseline groundwater sampling? Piezometer construction information presented in TM-2 suggests they may fit for sample collection.[1] Some existing piezometers appear to be outside the planned landfill footprint. If those piezometers are not used for baseline groundwater sampling, DOE should consider continuing groundwater level recording at those locations to support baseline monitoring and the groundwater field demonstration. **Additional TDEC comment (4/21/23):** Comment resolved, but TDEC requests a copy of the ORR [Oak Ridge Reservation] monitoring well requirements cited in the response. Presumably, this is the *Standard Specification for Well Drilling, Installation, and Abandonment* (SPG-00000-A005) cited in Section 3.1 (p. 12). c. Add a north arrow, and indicate whether it represents true north or grid north. **Additional TDEC comment (4/21/23):** Comment resolved; no further response required. d. Define the polygons in the legend. **Additional TDEC comment (4/21/23):** Comment resolved; no further response required. 1 *Technical Memorandum #2, Environmental Management Disposal Facility Phase 1 Monitoring, Oak Ridge, Tennessee (DOE/OR/01-2785&D1) and Responses to Comments on Technical Memorandum #1, Environmental Management Disposal Facility Phase 1 Monitoring, Oak Ridge, Tennessee* (DOE/OR/01-2785).	piezometers will not be used for baseline monitoring because these do not meet the requirements for an ORR monitoring well. Piezometers continue to be used for groundwater level recording, but will be plugged and abandoned when landfill construction activities begin. **Response to additional TDEC comment (4/21/23)** Agree. This specification has been provided. c. Agree. d. Clarification provided. The proposed sediment basins were removed and the figure was updated to match the current design configuration.
5	Sect. 3.1 pg 11	a. TDEC understands it may not be practical to retain all baseline wells for subsequent use in the detection monitoring network. However, TDEC recommends the baseline wells be installed following the same procedures that will be used for drilling, borehole characterization, and construction of the detection monitoring wells. This will maximize consistency between the baseline and detection monitoring data sets, as well as the potential for using baseline wells in the detection	a. Agree. The baseline wells are planned to be constructed consistent with the requirements for detection monitoring wells.

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		monitoring network. **Additional TDEC comment (4/21/23):** Comment resolved; no further response required. b. Given the fractured nature of the bedrock and saprolite at the EMDF site, screen intervals for baseline monitoring and detection monitoring should be determined by the FFA parties based on borehole characterization results. This approach was successful during previous site characterization efforts, as documented in TM-2. **Additional TDEC comment (4/21/23):** Comment resolved; no further response required. c. Revise the text to provide additional explanation of the rationale for 15-foot (ft) screened intervals in the shallower wells. It is unclear whether the intent is to increase the number of fractures encountered and associated groundwater yield or to maximize the volume of water available in the well for sampling. Ideally, adequate borehole characterization will identify the appropriate zones for low-flow monitoring, minimizing the need for longer well screens. It will also minimize the volume of water to be purged for wells requiring the removal of three casing volumes. **Additional TDEC comment (4/21/23):** Comment unresolved. As noted above, TDEC approval is not required for DOE to proceed at its own risk with the work outlined in the plan. However, consistent with state and EPA guidance, TDEC cautions against the use of screen lengths greater than 10 feet for baseline, detection, and closure monitoring wells.[2,3] There should be little need for longer screens if standard borehole characterization techniques are employed, as was done during the TM-2 hydrogeologic characterization effort and if groundwater samples are collected using modern low-flow methodology. Use of longer well screens may result in dilution of constituents present in groundwater flowing through discrete	b. Agree. The preliminary screened intervals were provided and will be adjusted as necessary based on field conditions and with agreement from the FFA parties. The following text was added: "These locations and screened intervals may be modified based on field conditions in consultation with the Federal Facility Agreement (FFA) parties." c. Agree. The following text was added: "Because of the variation in groundwater levels in areas of EMDF, a 15 ft screen interval was selected to provide the best opportunity to collect samples throughout the year." **Response to additional TDEC comment (4/21/23)** Agree. For the proposed wells with screen intervals greater than 10 feet, the screen intervals were reduced to 10 feet.

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		fractures. Doing so is not appropriate in any RCRA-compliant monitoring program. Doing so during baseline characterization may fail to detect any contamination that exists before landfill operations begin, risking unwarranted uncertainty during detection and closure monitoring.	
		d. Similarly, revise the text to provide additional explanation of the rationale for 30-ft screened intervals in the deeper wells. **Additional TDEC comment (4/21/23):** Comment unresolved. TDEC cautions even more strongly against the use of 30-ft-long screens, for the reasons described in the follow-up for Response 5c. TDEC is willing to evaluate and consider data collected during site characterization and lessons learned from EMWMF, particularly any borehole characterization information for intervals deeper than those already characterized for EMDF. In the absence of a compelling rationale, TDEC does not support the use of such long well screens.	d. Clarification provided. Text was revised to state that 10 ft well screens will be used. **Response to additional TDEC comment (4/21/23)** See revised response to 5.c and 5.d.
		e. What is the rationale for using stainless steel casings and screens? Available guidance and literature indicate polyvinyl chloride (PVC) materials are generally better suited for groundwater monitoring, particularly for radionuclides and metals, unless volatile organic compounds are expected to be present at very high concentrations. **Additional TDEC comment (4/21/23):** Comment resolved; no further response required. However, TDEC remains willing to consider more cost-effective approaches that meet technical and regulatory objectives.	e. Clarification provided. The EMDF monitoring wells will be constructed with stainless steel casings and screens consistent with the monitoring wells throughout the ORR.
		f. TDEC recommends initiation of baseline sampling before significant land disturbance. Revise the plan to clarify whether the project schedule aligns with this recommendation.	f. Clarification provided. Per the ROD (Sect. 2.12.2.7), baseline groundwater conditions must be documented before disposal facility operations begin, with results from at least four consecutive quarters of water quality sampling and analysis to establish baseline water quality that will be used as the basis for future monitoring. Text in Sect. 3 has been revised as

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			follows: "In accordance with the EMDF Record of Decision, baseline groundwater conditions for a detection monitoring program must be documented before disposal facility operations begin. Results from at least four consecutive quarters of water quality sampling and laboratory analysis must be reported to establish baseline water quality to be used as a basis for future monitoring. Therefore, baseline groundwater monitoring is currently planned for calendar year 2028–2029, at least one year prior to the opening of the EMDF. This period is expected to change based on the schedule for opening the EMDF."
		Additional TDEC comment (4/21/23): Comment unresolved. Based on Response 7, TDEC understands DOE plans to limit pre-operational baseline sampling to four quarterly events and defer that effort to a single year immediately prior to landfill operations. Therefore, TDEC initiated baseline surface water sampling in streams adjacent to the planned landfill. The objective of this effort is to support future decisions TDEC may be asked to make. TDEC's sampling plan guides sampling at seven locations on Bear Creek, Northern Tributary 10 (NT-10), and NT-11, as well as a spring that discharges to D-10W, which DOE plans to divert into the NT-10 channel.	**Response to additional TDEC comment (4/21/23):** See response to Comment 7.
		g. The plan should also indicate whether any clearing will be necessary to install the baseline well network and, if so, how tree removal will be scheduled to follow this key recommendation from TDEC's *Acoustic Survey of Bats at the Proposed EMDF Site 7a/7c, Bear Creek Valley, Oak Ridge Reservation* (Feb. 2017). Seasonal timber removal should be coordinated with the USFWS during the consultation process. The USFWS has published a framework suggesting timber removal at a project site should only occur during the fall/winter season (bat hibernation period). In other words, trees	g. Agree. The following text was added to Section 3. "Guidance from the ORNL Natural Resources group will be used to place well pads and access roads to minimize impacts to sensitive resources. Bat roosting trees will be identified in advance and removed prior to the summer foraging season."

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		should not be harvested during spring/summer season when bats are using trees (and forests) for foraging, roosting, and while females are raising their young (USFWS 2016a, 2016b, 2016c). **Additional TDEC comment (4/21/23):** Comment resolved; no further response required. h. **New TDEC comment on new text in D2 FSP** In response to EPA Comment 5, text was added to the fourth paragraph of Section 3.1. The new text indicates groundwater in the proposed downgradient Maynardville Limestone baseline monitoring wells will likely be impacted from existing contaminant plumes, but the baseline data will help differentiate between potential EMDF leakage and pre-existing contamination. The existing Bear Creek Valley plumes contain VOCs, gross alpha, and nitrate. The D2 plan has fewer analytes than the D1 plan, and the reduced list does not include the contaminants expected to be present in the plumes. Therefore, as currently planned, the baseline dataset will not accomplish the purpose of the legal requirements in the ROD-namely to support statistically defensible differentiation between baseline contamination and potential future leakage from EMDF. [2] TDEC, 2020, Policy and Guidance Manual, Division of Solid Waste Management, Solid Waste Program, May. [3] EPA, 1992, Solid Waste Disposal Facility Criteria: Technical Manual, EPA530-R-93-017.	h. Clarification provided. As noted, the intent of baseline sampling is to differentiate between pre-existing contamination and potential leakage from the EMDF. Therefore, the focus of the baseline sampling is on the contaminants that could be released from the EMDF so that this comparison can be performed. Additional contaminants that may be present in Bear Creek but that are restricted by the EMDF WAC (such as VOCs) are not required to be sampled.
6	pg 13 1st sentence	The *Focused Feasibility Study for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-2664&D4/R1) [FFS] states landfill wastewater discharge limits will be calculated when the discharge location and Bear Creek flow rates are determined. Regardless of the point of discharge, it will be necessary to monitor Bear Creek surface water during landfill operations. Therefore, TDEC recommends baseline surface water sampling in Bear Creek at the existing station at the NT-11 confluence and	Agree in part. Baseline data will be collected from Bear Creek at the NT-11 confluence, which is expected to be upstream of the to-be-determined discharge location. Note: The EMDF does not plan to discharge to NT-10 or NT-11. Section 3.1 last paragraph was revised as follows: "Surface water sampling will occur at three locations: flumes SF-1 located on NT-11, and SF 6 located on NT-10, installed during a previous EMDF hydrogeological

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		a new station at the NT-10 confluence. TDEC supports the plan to sample surface water in NT-10 and NT-11 to support detection and/or operational monitoring and in case landfill wastewater is eventually discharged to one or both streams. **Additional TDEC comment (4/21/23):** Comment unresolved. a) TDEC requests additional clarification whether DOE plans to characterize baseline conditions in NT-10 and NT-11. Available information includes the following. • Response 6 includes language that appears contradictory. o One sentence states, "The EMDF does not plan to discharge to NT-10 or NT-11, therefore, baseline sampling is not required." o Another sentence, also included on p. 14 of the revised document, states, "Surface water sampling will occur at three locations: flumes SF-1 located on NT-11, and SF 6 located on NT-10 ... , and the existing Bear Creek monitoring station at the NT-11 confluence with Bear Creek." • DOE Response 6 states, "Baseline data will be collected from Bear Creek at the NT-11 confluence ... ," but Figure 3 shows only two baseline surface water monitoring locations: NT-10 (SF-6) and NT-11 (SF-1). No locations are shown for Bear Creek. • DOE Response 6 states, "The EMDF does not plan to discharge to NT-10 or NT-11, therefore, baseline sampling is not required." However: o Text on p. 1 states, "Surface water monitoring is included because groundwater from the uppermost aquifer primarily discharges to surface water features." o Text on p. 3 states, "Groundwater within the saturated zone converges and discharges slowly into NT stream channels supporting base flow along the valley floors, particularly during the wet season." o Figure 3 shows baseline surface water monitoring	characterization project, and the existing Bear Creek monitoring station at the NT-11 confluence with Bear Creek." **Response to additional TDEC comment (4/21/23):** a) See responses to specific bullets below. • Agree. See revised response 6 above. • Agree. Figure 3 was revised to show the Bear Creek monitoring locations. • See revised response above.

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		locations on NT-10 (SF-6) and NT-11 (SF-1). o Revised text on p. 14 states, "Surface water sampling will occur at...flumes SF-1 located on NT-11 and SF-6 located on NT-10 .... " b) TDEC also requests clarification of the rationale for not characterizing baseline conditions at the confluence of NT-10 with Bear Creek. Response 6 states, "Baseline data will be collected from Bear Creek at the NT-11 confluence, which is expected to be upstream of the to-be-determined discharge location." The FFS (p. K.1-28) states, "The design of the EMDF Landfill Water Treatment System is still under development and the discharge location and associated stream conditions are not yet known." If DOE has determined the approximate discharge location, TDEC recommends DOE collect baseline data upstream and downstream of that location to avoid potential delays in the development and approval of effluent limits for landfill wastewater prior to landfill operation, a key ROD requirement.	b) Clarification provided. While the approximate discharge location for the EMDF Landfill Water Treatment System has not yet been determined, it is expected to be located downstream from NT-11. However, as the design progresses, if the discharge location is determined to be to the confluence of Bear Creek and NT-10, this location will be added. This decision will be made in time to obtain four quarters of monitoring results required by the ARAR.
7	Sect. 3.2 pg 13 2nd sentence	TDEC recommends deleting the sentence. Baseline monitoring should establish a statistically defensible data set, which requires more than four data points for each COC. If four results fail to adequately represent a COCs baseline variability, there is a risk that detection monitoring results may trigger undue concern. This is particularly true if a COC is not detected during the first four quarterly sampling events and the baseline value is established at the project quantitation limit. Collection of more than four results will support evaluation of how frequently to sample a COC during detection monitoring. For example, multiple (more than four) non-detect results may support sampling a COC less often once detection monitoring begins. **Additional TDEC comment (4/21/23):** Comment unresolved.	Disagree. Per the ROD (Sect. 2.12.2.7), baseline groundwater conditions must be documented before disposal facility operations begin, with results from at least four consecutive quarters of water quality sampling and analysis to establish baseline water quality that will be used as the basis for future monitoring. However, the text was modified to show that these locations are intended to continue to be monitored as follows, "After the first year of sampling, baseline characterization sampling will continue semi-annually until the detection/operation monitoring program for EMDF is implemented. Monitoring will then continue as part of the detection/operation monitoring program for EMDF, unless specific wells or surface water locations are removed from the network by agreement with the FFA parties." **Response to additional TDEC comment (4/21/23):**

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		a) TDEC agrees baseline groundwater conditions must be documented *before* disposal facility operations begin, as required by the ROD. Further, given the numerous disposal areas in the valley contributing contaminants to groundwater and surface water, TDEC maintains DOE should establish a statistically defensible baseline data set based on *more than* four data points for each COC *before* landfill operations begin. Response 7 indicates DOE intends to continue collecting EMDF baseline data *during* detection/operational monitoring – i.e., *after* the landfill begins accepting waste and discharging wastewater. TDEC does not support this approach. There is adequate time to collect sufficient data before operations. As indicated in the D2 document (p. 11), EMDF is not planned to be operational until 2029. Although monitoring data collected during operations were used to support the development of EMWMF baseline threshold values, that approach was implemented retroactively because insufficient baseline data were collected before operations began and because reporting limits were not sufficiently sensitive to support comparison with threshold criteria. Any agreement to follow this approach for EMDF would require a ROD amendment with a clear description of the process to be followed. b) As noted in part "a" of this follow-up, Response 7 and corresponding text in the revised plan (p. 14) state baseline characterization sampling will continue *as part of* the detection/operation monitoring program. This differs from text on p. 7 of the revised plan, which states baseline characterization sampling will continue semi-annually *until* the detection/operation monitoring program for EMDF is implemented. c) The response only addresses baseline characterization of baseline groundwater conditions using monitoring wells. As noted in the follow-up to Response 6b, DOE should collect baseline data upstream and downstream of the planned wastewater discharge location to avoid potential delays in finalizing landfill wastewater discharge limits, as some	a) Clarification provided. DOE will be in compliance with the ARAR as baseline groundwater conditions will be established and before disposal facility operations begin. Starting baseline monitoring earlier is not required by the ARAR. The baseline wells are intended to become part of the detection monitoring network and will continue to be monitored. A ROD amendment would not be required. b) Agree. The text was revised as shown in the initial response 7. Page 7 text was revised as follows: "After the first year of sampling, baseline characterization sampling will continue semi-annually until the detection/operation monitoring program for EMDF is implemented, then continue as part of the detection/operation monitoring program." c) Agree in part. See revised response to Comment 6 to include surface water locations.

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		limits may be impacted by current site conditions at the point of discharge, which would be identified with a statistically defensible baseline established prior to the start of EMDF operations.	
8	Table 2 pg 14	Baseline monitoring should include all analyses planned for detection monitoring. Therefore, Table 2 should include analyses documented in Table K.1.16 and Appendix C, Attachment 4 of the *Focused Feasibility Study for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-2664&D4/R1) [FFS]. It appears the following surface water analyses should be added to Table 2. • Ammonia Nitrogen, Total as N • Hardness as CaCO3, mg/I • Nitrogen, total (as N) • Phosphorus, total as P • Total Suspended Solids • Whole effluent toxicity - chronic/acute **Additional TDEC comment (4/21/23):** Comment unresolved. The response highlights TDEC's rationale for recommending initiation of baseline sampling before significant construction begins impacting baseline conditions. Based on Response 7, TDEC understands DOE plans to defer baseline sampling until construction activities have been underway for at least four years. Therefore, TDEC initiated baseline surface water sampling to support future decisions DOE may request. As indicated in TDEC's plan for baseline monitoring of EMDF surface water, TDEC is analyzing samples from Bear Creek, NT-10, and NT-11 for a broad list of metals, radionuclides, VOCs, semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls, dioxins, furans, perfluoroalkyl and polyfluoroalkyl substances, and other water-quality parameters. Monitoring a comprehensive suite of analytes is intended to maximize the utility of this data set for supporting future	Disagree. Construction of the EMDF will be in progress during the baseline sampling, including soil disturbances, reseeding and hydro-mulching. Even with erosion and sediment controls, it is likely that monitoring during construction activities will not be representative of baseline surface water conditions. Therefore, with the exception of total suspended solids, these constituents were not added to Table 2 for baseline samples. **Response to additional TDEC comment on 4/21/23** Disagree. As described above, the purpose of baseline sampling is to differentiate between pre-existing contamination and potential leakage from the EMDF. Changes in environmental conditions over time during construction of the EMDF are not considered baseline sampling. See response to 5h.

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		decisions. Not only did DOE reject TDEC's recommendation to expand the analytical suite for baseline monitoring, the revised FSP markedly reduces the number of analytes from the list presented in the D1 plan. The revised list excludes entire chemical groups, such as SVOCs and polychlorinated biphenyls (PCBs), that were included in the D1 plan and omits known Bear Creek Valley contaminants (VOCs, gross alpha, and nitrate). A baseline analyte list should include what are thought to be key COCs, and it should also include potential COCs due to uncertainties regarding future waste characteristics and monitoring needs. Furthermore, it is not appropriate to remove PCBs from the analyte list due to frequency of detection (Appendix C FFS) because a sufficiently sensitive analytical method was not used to adequately evaluate AWQC exceedances. TDEC recommends DOE expand Table 2 to analyze a more complete list of potential contaminants, such as those in TDEC's sampling plan. This recommendation is intended to facilitate future detection and operational monitoring needs and streamline review/approval of associated results. Finally, in response to an EPA comment, the revised plan introduces a note near the end of Section 3.3 (p. 14) that states "see Sect. 4.4" [of the FFS]. It is not clear whether that note should refer to Appendix C instead of Sect. 4.4.	See response to 5h. See response to 5h. Clarification provided. Sect. 4.4 refers to the section in this FSP that contains the list of COCs.
9	pg 15	For clarity, reword *Qualified and trained personnel with all specialized training requirements will perform...* as follows: *Qualified personnel with all required specialized training will perform...* or *Qualified and trained personnel meeting all specialized training requirements will perform....* **Additional TDEC comment (4/21/23):** Comment resolved; no further response required.	Agree. Text revised as suggested.

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10	Sect. 4.1.2 pg 15 3rd and 4th para	Consider switching the order of these paragraphs because low-flow sampling is mentioned first and is the preferred sampling method. **Additional TDEC comment (4/21/23):** Comment resolved. Follow-up comment: Regarding the micropurging discussion in the third paragraph, TDEC requests rationales for 1) excluding dissolved oxygen (DO) and oxidation-reduction potential (ORP) as stabilization criteria, and 2) setting the acceptable specific conductance variability so high (± 10%). Finally, TDEC requests a copy of PROC-ES-2101 *Groundwater Sampling Wells or Piezometers.*	Agree. Text revised as suggested. **Response to additional TDEC comment on 4/21/23** Clarification provided. The procedure was provided as requested. DO and ORP are used as stabilization criteria as part of the procedure and were not specifically stated in the FSP. Specific Conductance at +/- 10 percent is standard across the industry following the guidance given in EPA SESDPROC-301, section 3.3. Because the procedure is listed that contains these requirements, the detailed instructions were deleted. The revised paragraph is as follows: "For the micropurging sampling method, monitoring wells are purged at a low rate (typically 300 mL/min or less) to ensure minimal drawdown of the water level in the well (< 0.1 ft per quarter hour). Groundwater samples are collected upon stabilization of water levels and selected indicator parameters. ~~over four consecutive readings at 5-minute intervals (pH +/- 0.1 unit, specific conductance +/- 10 percent, constant temperature over three consecutive readings, and turbidity less than 10 nephelometric turbidity units [NTUs]).~~ "

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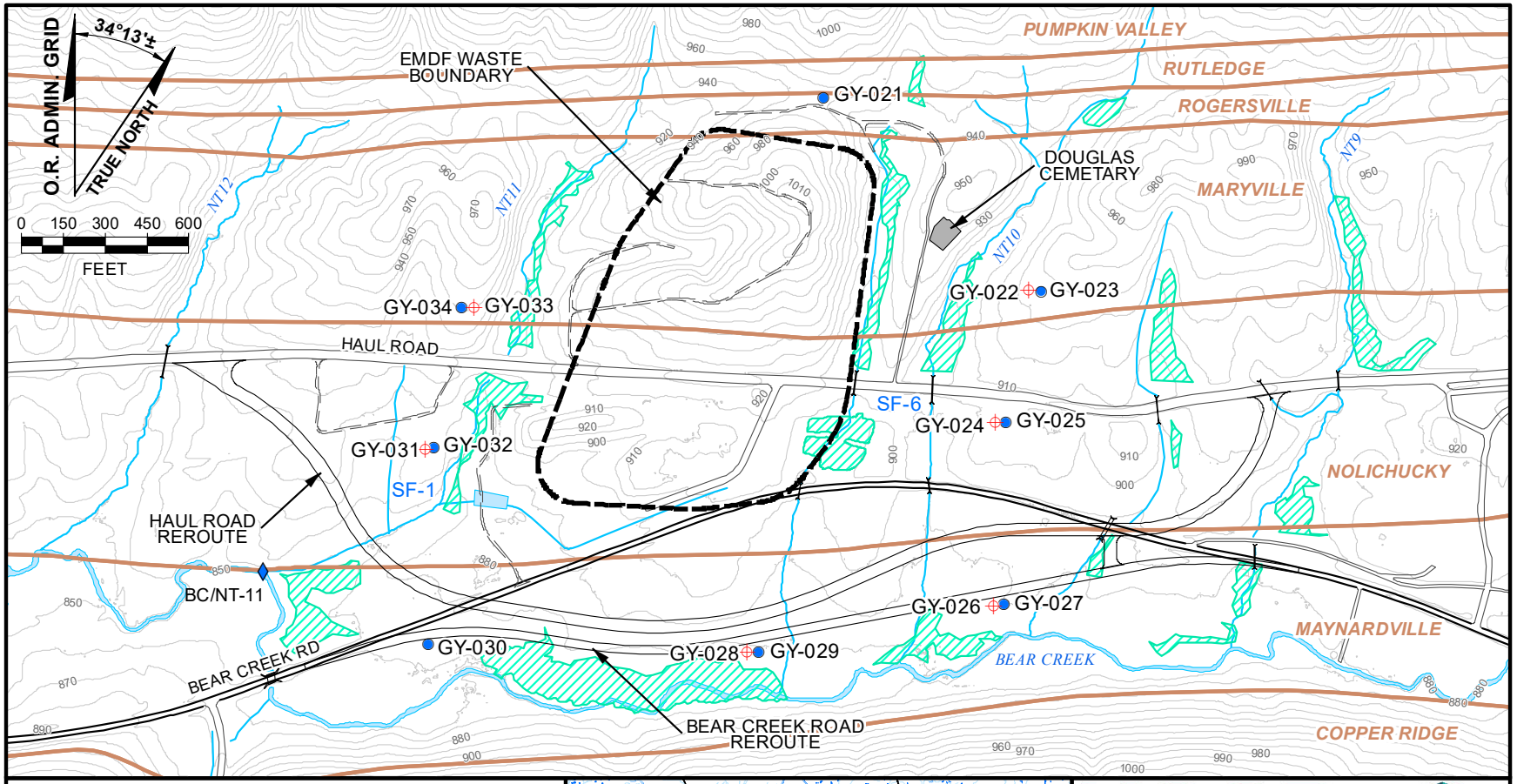
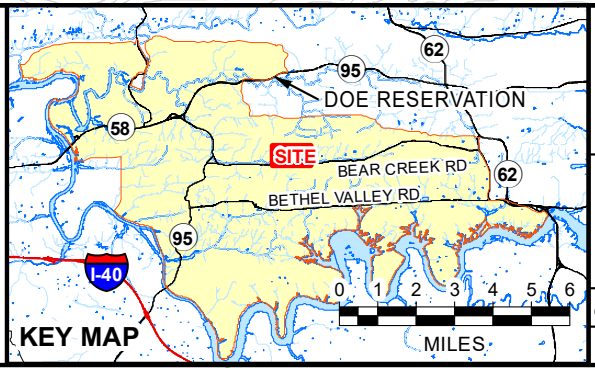
11	Sect. 4.2 pg 15	Baseline sampling should begin as soon as possible, given the need for a statistically meaningful baseline data set before landfill operations begin and the likelihood that dry streams will prevent data collection during some sampling events. **Additional TDEC comment (4/21/23):** Comment unresolved. See follow-up to Response 7. TDEC remains concerned DOE's plan will lead to unnecessary uncertainties and potential delays in future phases of work. In addition, if DOE encounters dry streams during a sampling event, TDEC recommends returning to collect surface water samples when there is sufficient flow rather than merely logging an observation the station is dry, as indicated at the top of p. 16.	See response to Comment 7. See response to follow-up comments on Comment 7.
12	Table 4 pg 24	Check the well dentification numbers in each column (deep and shallow) and correct if needed. They match Figure 3, but the last two deep well numbers are odd, whereas the first four are even. **Additional TDEC comment (4/21/23):** Comment resolved; no further response required.	Clarification provided. The table is correct.
11	Sect. 4.4 pg 16 2nd para 1st sentence	Editorial suggestion Change *The list...are found...* to *The list... is found ....* **Additional TDEC comment (4/21/23):** Comment resolved; no further response required.	Agree. Note that text revisions deleted this sentence.



LEGEND:

- ASPHALT ROAD
- GRAVEL ROAD
- ROAD REROUTE
- SURFACE WATER
- STREAM
- DOUGLAS CEMETERY
- WETLANDS
- LANDFILL CONSTRUCTION BOUNDARY
- SURFACE CONTOUR (10 FT)
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- SURFACE WATER MONITORING LOCATION



UCOR
United Cleanup Oak Ridge LLC

ENVIRONMENTAL MANAGEMENT
DISPOSAL FACILITY

DRAWN BY:	REQUESTOR:	DATE:	UNITS:
G. JERNIGAN	A. PRIMROSE	AUG 14, 2023	FEET

GIS FILE: P:\21001\MXDS\B85_EM_DISP_FACILITY_R3.mxd