Oak Ridge Site Specific Advisory Board Monthly Meeting



Wednesday, June 14, 2023, 6 p.m.

The mission of the Oak Ridge Site Specific Advisory Board (ORSSAB) is to provide informed advice and recommendations concerning site specific issues related to the Department of Energy's (DOE's) Environmental Management (EM) Program at the Oak Ridge Reservation. In order to provide unbiased evaluation and recommendations on the cleanup efforts related to the Oak Ridge site, the Board seeks opportunities for input through collaborative dialogue with the communities surrounding the Oak Ridge Reservation, governmental regulators, and other stakeholders.

CONTENTS

AGENDA

PRESENTER BIO

CALENDARS

- 1. June
- 2. July (draft)

BOARD MINUTES/RECOMMENDATIONS & MOTIONS

1. Draft May 10, 2023, Full Board Meeting minutes for approval

REPORTS & MEMOS

- 1. Abbreviations & Acronyms
- 2. FY 2023 Incoming Correspondence
- 3. FY 2023 Travel Opportunities
- 4. Proposed Plan for the Record of Decision for Groundwater in the K-31/33 Area at ETTP_March 2023 (DOE/OR/01/2922&D2)
- Response to Recommendation 253 on the FY 2025 Budget
 Notice of Board Officer Elections



Oak Ridge Site Specific Advisory Board Wednesday, June 14, 2023, 6:00 p.m. Hybrid meeting AGENDA

I.	Welcome and announcements (L. Shields)	
II.	Comments from federal and state agency representatives (M. Noe, R. Petrie, S. Urquhart-Foster, K. Czartoryski)	
III.	Presentation: K-31/33 Groundwater Remedies (R. Petrie)	
	 Questions regarding the presentation/speaker only	
IV.	 Public comment period (S. Kimel)	
V.	 Call for additions & motion to approve agenda (L. Shields)	
VI.	 Board Business (L. Shields)	
VII.	Responses to recommendations & DDFO's report (M. Noe)	
VII	 A. EM/Stewardship (M. Sharpe) B. Next meeting – June 28 continued discussion on Main Plant and K-31/33 Groundwater Remedies 	
IX.	Additions to agenda & closing remarks (Shields)	
X.	Adjourn	

Roger Petrie serves as the regulatory affairs specialist and Federal Facilities Agreement projects manager for the U.S. Department of Energy's (DOE) Oak Ridge Office of Environmental Management. Mr. Petrie brings unique insight and understanding to the position with more than 25 years of experience working for the Tennessee Department of Environment and Conservation (TDEC) and cleanup contractor UCOR.

Prior to joining the federal program in 2020, Mr. Petrie provided regulatory support to UCOR, the prime environmental cleanup contractor leading remediation projects across DOE's Oak Ridge Reservation. During his time with the state, he served as the Federal Facility Agreement projects manager for TDEC and worked with counterparts at the U.S. Environmental Protection Agency and DOE to facilitate Comprehensive Environmental Response, Compensation, and Liability Act cleanup on the Oak Ridge Reservation.

Mr. Petrie began his career in the Aquatic Biology Division of the Tennessee Valley Authority before transitioning to the Oak Ridge National Laboratory's Environmental Sciences Division conducting research focused on bioaccumulation of contaminants in fish. Mr. Petrie holds a BS and MS in Wildlife and Fisheries Science from the University of Tennessee – Knoxville.

June

2023

Topic: ETTP K-31/K-33 Area Groundwater Remedies

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6 Tour of ETTP	7 Executive Committee meeting – 4 p.m. (virtual)	8	9	10
11	12	13	14 Full Board Meeting – 6 p.m. (hybrid)	15	16	17
18	19 Offices closed for Juneteenth Holiday	20	21	22	23	24
25	26	27	28 EM & Stewardship Committee meeting – 6 p.m. (hybrid)	29	30	

For information about attending meetings virtually or in person, please email <u>orssab@orem.doe.gov</u> at least 1 week prior to the scheduled meeting.

ORSSAB Support Office: (865) 241-4583 or 241-4584

DOE Information Center: (865) 241-4780



2023

Topic: None

July

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4 Offices closed for July Fourth Holiday	5 NO Meeting	6	7	8
9	10	11	12 NO Meeting	13	14	15
16	17	18	19	20	21	22
23	24	25	26 NO meeting	27	28	29
30	31					

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Many Voices Working for the Community

Oak Ridge Site Specific Advisory Board

Monthly Meeting of the Oak Ridge Site Specific Advisory Board

DRAFT May 10, 2023 Meeting Minutes

The Oak Ridge Site Specific Advisory Board (ORSSAB) held its monthly meeting virtually via Zoom and in person at 1 Science.gov Way on Wednesday, May 10, 2023 at 6 p.m. Copies of referenced meeting materials are attached to these minutes. A video of the meeting was made and is available on the board's YouTube site at <u>www.youtube.com/user/ORSSAB/videos</u>.

Members Present

Atilio Anzellotti
Kris Bartholomew
Mary Butler
Harold Conner, Jr.
Paul Dill
Rosario Gonzalez

Noah Keebler Amy Jones Harriett McCurdy Michelle Lohmann Mike Mark Thomas McCormick

Christine Michaels Michael Sharpe Leon Shields Bonnie Shoemaker

Members Absent

John Tapp¹

Tom Tuck

¹Third consecutive absence

Liaisons, Deputy Designated Federal Officer, and Alternates Present

Melyssa Noe, ORSSAB Deputy Designated Federal Officer (DDFO), OREM Roger Petrie, ORSSAB Alternate DDFO, OREM Kristof Czartoryski, Tennessee Department of Environment and Conservation (TDEC) Carl Froede, EPA

Others Present

Emily Day, UCOR Joanna Hardin, OREM Shelley Kimel, ORSSAB Staff Heather Lutz, TDEC Eileen Marcillo, TDEC Sara McManamy-Johnson, ORSSAB Staff Abby Newberry, OREM Samantha Pack, UCOR Sam Scheffler, OREM L'Tonya Spencer, EPA Erin Sutton, OREM Laura Wilkerson, OREM

Five members of the public were present.



Many Voices Working for the Community

Oak Ridge Site Specific Advisory Board

Liaison Comments

Ms. Wilkerson– Ms. Wilkerson began the meeting by updating the board on OREM cleanup progress at ORNL, including buildings 3005 and the U-233 Disposition Project, and Y-12. She noted DOE is accepting public comment on the groundwater plans. She said the contract to build the K-25 Viewing Platform at East Tennessee Technology Park (ETTP) had been awarded and a groundbreaking would happen this week.

Mr. Froede – No comments.

Mr. Czartoryski – Mr. Czartoryski introduced Heather Lutz TDEC program manager and the department's groundwater issues expert.

Presentation

Ms. Jones introduced OREM's Roger Petrie to present on OREM's East Tennessee Technology Park Main Plant Groundwater Proposed Plan.

Mr. Petrie noted that OREM is expecting two major milestones in its groundwater efforts with Records of Decision (ROD) on groundwater in the Main Plant Area, the topic of tonight's presentation, and for the K-31/33 Area, which will be covered in June. A third area, called Zone 1, will be discussed in the future.

Mr. Petrie provided a brief background of the history of the ETTP site (formerly known as K-25) and OREM's cleanup efforts to date. He discussed the cleanup strategy and timeline for the entire DOE Reservation (ETTP, Oak Ridge National Laboratory (ORNL) and Y-12 National Security Complex (Y-12) cleanup, how ETTP fits into that timeline, the scope of the proposed groundwater plan and how OREM evaluated a variety of options for the cleanup process, as well as how public input is integrated into the selection process.

In 1992 DOE joined regulatory agencies EPA and TDEC to form a Tri-Party Federal Facility Agreement to address cleanup on the DOE Reservation. Actions in the early 1990s addressed off-site contamination and high-risk/priority environmental issues. In the 2000s several Watershed Interim RODs were signed to address contamination sources and building demolition. Those actions continued until present day. All buildings have been removed and soil remediation should be complete very soon. So the agencies are shifting focus to groundwater.

He said the proposed plan features a proposed groundwater remedy that the three parties, DOE, EPA, and TDEC, believe will be the most appropriate cleanup remedy for this project. The scope of the plan covers six areas of groundwater contamination within the Main Plant Area. The preferred alternative is an active remediation using bioremediation and continued land-use controls that are already in place at ETTP, which, for example, prevent disturbing soil at certain depths if building new structures.

Mr. Petrie noted that in past actions public involvement has changed previous proposed remedies and that's why it's so important to get public feedback.

He outlined the six major contamination plumes that are being addressed in this proposed plan scope. He said there were others that would be addressed in follow-on decisions. He emphasized that this plan is the first phase of remediation and does not mean cleanup will be stopped in the Main Plant Area following the proposed plan. An interim ROD will cover this project until all planned projects are complete and the ROD can be finalized. The main purpose of this interim ROD is to address volatile organic compounds (VOCs) in these groundwater plans.

Mr. Petrie noted that there are several alternatives considered in the proposed plan. He said that, by law, DOE must include a "no action" alternative, which details what would occur if DOE did nothing to address the contaminants. It is not something that would ever be accepted, but is there for comparison purposes.

He said alternative one for this ROD is the in-situ thermal treatment, which entails using large probes inserted into the ground used to heat up the contaminant. TCE is volatile and evaporates relatively easily in the atmosphere. However, because the concentration of the material in the soil is so high that is not feasible. Instead, the parties prefer the second option, which is in-situ bioremediation. It would mean inserting microorganisms into the contaminated areas that would break down and consume the TCE. That would bring the contamination down significantly, perhaps even enough that further action using thermal treatment would be possible. Alternative three is called soil mixing and involves mixing certain chemicals into the soil that would help neutralize the TCE. That option, along with enhanced bioremediation into deeper zones was an alternative that also was not selected.

Mr. Petrie briefly discussed the costs of each alternative as shown in the presentation. He said each alternative has to be compared with nine decision criteria required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), one of which is cost. The others are protection of human health and environment; compliance with relevant standards; long-term effectiveness; reduction of toxicity, mobility and volume; short-term effectiveness; ability to be implemented; state acceptance; and community acceptance;

Mr. Petrie continued explaining how the preferred alternative, bioremediation, would remove contaminants of concern. He noted how the remedy aligned with the nine CERCLA decision criteria with community acceptance being part of why DOE is releasing the proposed plan – to seek public input.

DOE will work with EPA and TDEC to design the project, which will involve drilling wells to inject the microbes and associated support materials. The agencies will decide on the placement of the wells and frequency of injections as well as monitoring. They will also agree on success criteria. He noted there was a small demonstration of the technology at Oak Ridge National Laboratory.

Board members asked the following questions:

• Ms. Shoemaker asked what contaminants were being referenced. Mr. Petrie replied that the prominent one is cesium, which has a short half-life and DOE is seeing levels of cesium drop as

it decays.

- Mr. Connor asked what the contaminants of concern for most of these plumes. Mr. Petrie said the majority VOC is trichloroethylene (TCE), which was used as a de-greaser for equipment. In fact, it is still used today as a cleaner. The issue at ETTP is the extremely large amounts that were needed as well as the long length of time it was in use.
- Ms. Shoemaker asked what other projects have used this technology. Mr. Petrie said only the ORNL pilot study had been done locally, but that other projects, including at the Department of Defense had successfully used the same technology. Ms. Shoemaker also asked about various water criteria levels in local water sources. Mr. Petrie said that until the groundwater sources are addressed, it will be difficult to know the exact impact because there are other sources outside DOE control. Ms. Shoemaker also asked about remediation of various classified burial grounds. Mr. Petrie confirmed that some had been remediated while others have not. He confirmed there are plumes that appear to originate in that area that would be part of future decisions. He also noted it is challenging to work in those areas due to the security and finding workers, such as well drillers, who also have the needed clearances.
- Ms. Michaels asked about how the quantity of microorganisms changed the process. DOE's Erin Sutton responded and said there are technologies where different types of microorganisms can be introduced, but in this instance the needed organisms are available locally and keeping native species is preferred.
- Mr. Bartholomew asked about the volume of area to be remediated and how much TCE was
 used. Mr. Petrie explained the measurements used and said while DOE has tried to do a historical
 evaluation of how much TCE was used, it was difficult to say how much was used because
 during the war-time operations the priority of record-keeping was very different than today.
 Approved disposal methods were also much different than current rules. He also noted the
 extremely large amounts of material ordered by DOE at that time. He noted DOE had done
 extensive surveys of some areas and has been able to generate 3D models of the contamination
 underground, however that sort of project is very expensive and not deemed a practical/useful
 approach to using cleanup funds.

Mr. Bartolomew asked about tracking the expansion of plumes. Mr. Petrie confirmed that is something DOE watches closely as injecting material into the plumes can cause expansion if not done correctly. That was also a reason to wait on using thermal remediation methods as evaporation can also cause expansion if not done properly.

- Ms. Butler asked what happens to the microorganisms after they injest contaminants. Mr. Petrie said there was some concern that due to the high concentration of TCE in these plumes that, while it can be a food source, it may also prove to be toxic. That is one of the issues to be worked out when evaluating how successful a project will be.
- Ms. McCurdy asked for specifics on the type of organisms being used. Mr. Petrie said they are a type of bacteria and the degradation of TCE is an anaerobic process.

- Mr. Anzelotti asked how the plumes interact with he environment based on the area's unique geography. Mr. Petrie briefly mapped out some of the area and said none of the contamination being discussed impacted residential areas. Mr. Anzelotti asked if the breakdown by the bacteria caused any greenhouse effect? Mr. Scheffler said at the magnitude that would result there would be no appreciable effect.
- Mr. Connor asked what happens if the remedy does not lower contamination to the levels that are being aimed for? Mr. Petrie said there are other alternatives or active treatments that DOE may attempt, such as those mentioned previously. It's also possible to get a temporary waiver and continue monitoring until new technologies are available.

Ms. Lutz said TDEC believes the remedy will handle the plumes based on its common use and success in our area. She noted that there are additional follow-on projects planned, that this is just the beginning.

- Mr. Luther Gibson asked about other plumes. Mr. Petrie said follow on actions will evaluate those in future actions including the technetium contamination in some plumes. He noted that data DOE has from ongoing monitoring is the plumes are already decreasing naturally. Mr. Gibson asked how much contamination was caused by legacy operations versus demolition. Mr. Petrie said most was through legacy operations, however the technetium was aggravated by demolition of certain buildings.
- Mr. Rudy Weigel shared his support of the project and his experience working on the reservation that confirmed DOE's difficulty getting construction and other skilled labor employees that are also trained for the specific cleanup projects and with the needed security clearances.

Questions from the Public

• None

Public Comment

• Public Comment #1 – Mr. Luther Gibson shared comments on the board's budget recommendation and suggested additions. He also advocated in favor of additional focus on retiree pensions.

Board Business/Motions

- Mr. Shields asked for a motion to approve meeting minutes.
 - 5.10.23.1 Motion to approve February 8, 2023 meeting minutes Motion made by Ms. Jones and seconded from the floor. Motion passed.
 - 5.10.23.2 Motion to approve March 8, 2023 meeting minutes.
 Motion made by Ms. Jones and seconded by Ms. Butler. Motion passed.

- Mr. Shields asked for a motion to approve the budget recommendation.
 - 5.10.23.3 Motion to approve the Recommendation on the FY 2025 OREM Budget Motion made by Ms. Jones and seconded by Ms. McCurdy. Motion passed.
- Mr. Shields asked for a motion to approve the recent Chairs Recommendation
 - 5.10.23.4 Motion to approve the EM SSAB Chairs Recommendation on implementation of recommendations by DOE Motion made by Ms. Shoemaker and seconded by Ms. Butler. Motion passed.

Responses to Recommendations & Alternate DDFO Report

Ms. Noe told members that OREM had selected potential new members from applicants received during the recent recruitment. The membership packet is now under preliminary review by DOE headquarters. She also noted OREM is in the middle of planning for the Fall Chairs meeting in the first week of October. She said that will be a great opportunity for the entire board to meet their counterparts from other sites. She noted it would be held at the DoubleTree Hotel in Oak Ridge, and other activities, including a tour of the reservation are planned.

Committee Reports

<u>Executive</u> – None. Next meeting to be scheduled.

EM & Stewardship - None. Next meeting is May 24.

Additions to the Agenda & Open Discussion

None.

Action Items

None

The meeting adjourned at 7:20 p.m.

I certify that these minutes are an accurate account of the May 10, 2023, meeting of the Oak Ridge Site Specific Advisory Board.

Leon Shields, Chair

Michelle Lohmann, Secretary

May 10, 2023

Oak Ridge Site Specific Advisory Board

Abbreviations/Acronyms List for Environmental Management Projects

- AM action memorandum
- ACM asbestos containing material
- ARARs Applicable or Relevant and Appropriate Requirements
- ARRA American Recovery and Reinvestment Act
- BCV Bear Creek Valley
- BG burial grounds
- BV Bethel Valley
- CARAR Capacity Assurance Remedial Action Report
- CART carbon steel casing dollies
- CBFO Carlsbad Field Office
- CERCLA Comprehensive Environmental Response, Compensation
 - and Liability Act
- CD critical decision
- CH contact handled
- CNF Central Neutralization Facility
- COLEX column exchange
- CS construction start
- CY calendar year
- D&D decontamination and decommissioning
- DARA Disposal Area Remedial Action
- DDFO Deputy Designated Federal Officer
- DNAPL Dense Non-Aqueous Phase Liquids
- DOE Department of Energy
- DSA documented safety analysis
- DQO data quality objective
- EE/CA engineering evaluation/cost analysis
- EFPC East Fork Poplar Creek
- EM environmental management
- EMDF Environmental Management Disposal Facility
- EMWMF Environmental Management Waste Management Facility
- EPA Environmental Protection Agency
- EQAB Environmental Quality Advisory Board
- ETTP East Tennessee Technology Park
- EU exposure unit
- EV earned value
- FACA Federal Advisory Committee Act
- FCAP Facilities Capability Assurance Program
- FFA Federal Facility Agreement
- FFS Focused Feasibility Study
- FPD federal project director
- FY fiscal year
- GIS geographical information system

GW – groundwater

- GWTS groundwater treatability study
- HQ Headquarters
- HRE Homogenous Reactor Experiment
- IROD Interim Record of Decision
- ISD In-Situ Decommissioning
- LEFPC Lower East Fork Poplar Creek
- LGWO Liquid and Gaseous Waste Operations
- LLW low-level waste
- MLLW mixed low-level waste
- MSRE Molten Salt Reactor Experiment
- MTF Mercury Treatment Facility
- MV Melton Valley
- NaF sodium fluoride
- NDA non-destructive assay
- NEPA National Environmental Policy Act
- NNSS Nevada National Security Site (new name of Nevada Test Site, formerly NTS)
- NPDES National Pollutant Discharge Elimination System
- NPL National Priorities List
- OR Oak Ridge
- ORGDP Oak Ridge Gaseous Diffusion Plant
- OREIS Oak Ridge Environmental Information System
- OREM Oak Ridge Office of Environmental Management
- ORNL Oak Ridge National Laboratory
- ORO Oak Ridge Office
- OROP Oak Ridge Oxide Processing
- ORR Oak Ridge Reservation
- ORRR Oak Ridge Research Reactor
- ORRS operational readiness reviews
- PaR trade name of remote manipulator at the Transuranic Waste Processing Center
- PCB polychlorinated biphenyls
- PCCR Phased Construction Completion Report
- PM project manager
- PP Proposed Plan
- PPE Personal Protective Equipment
- QAPP Quality Assurance Project Plan
- RA remedial action
- **RAR Remedial Action Report**
- RAWP Remedial Action Work Plan
- RCRA Resource Conservation Recovery Act
- RDR Remedial Design Report
- RDWP Remedial Design Work Plan
- RER Remediation Effectiveness Report

RFI – Request for Information

RGRS – Reactive Gas Removal System

RH – remote handled

RI/FS – Remedial Investigation/Feasibility Study

RIWP – Remedial Investigation Work Plan

RmAR – Removal Action Report

RmAWP – Removal Action Work Plan

ROD – Record of Decision

RSE – Remedial Site Evaluation

RUBB – trade name of a temporary, fabric covered enclosure

S&M – surveillance and maintenance

SAP – sampling analysis plan

SEC – Safety and Ecology Corp.

SEP – supplemental environmental project

STP – site treatment plan

SW – surface water

SWSA – solid waste storage area

Tc – technetium

TC – time critical

TDEC – Tennessee Department of Environment and Conservation

TRU – transuranic, an artificially made, radioactive element that has an atomic number higher than uranium in the periodic table

TSCA – Toxic Substances Control Act

TWPC – Transuranic Waste Processing Center

U – uranium

UEFPC – Upper East Fork Poplar Creek

UPF – Uranium Processing Facility

URS/CH2M – (UCOR) DOE's prime cleanup contractor

VOC – volatile organic compound

VPP – Voluntary Protection Plan

WAC – waste acceptance criteria

WEMA – West End Mercury Area (at Y-12)

WHP – Waste Handling Plan

WIPP – Waste Isolation Pilot Plant

WRRP – Water Resources Restoration Program

WWSY – White Wing Scrap Yard

Y-12 – Y-12 National Security Complex

ZPR – Zero Power Reactor



#	Date	То	From	Description	DOEIC, Notified board officers of receipt
190	5/2/2023	Petrie, DOE	Non-Significant Change to the Record of Decision for Phase I Interim Source Control Actions in Upper East Fork Poplar Creek Characterization Area, Oak Ridge, Tennessee (DOE/OR/01- 1951&D3)		DOEIC, Notified board officers of receipt
191	5/8/2023	Petrie, DOE	Andrews, EPA Andrews, EPA Andrews, EPA EPA Approval Addendum to the Removal Action Work Plan for the Y- 12 Facilities Deactivation/Demolition Project, Oak Ridge, Tennessee: Beta-1 Complex Demolition (DOE/OR/01- 2479&D1/A14/R1)		DOEIC, Notified board officers of receipt
192	5/10/2023	Petrie, DOE	Young, TDEC	Dung, TDEC TDEC Approval RE: Addendum 2 to the Fiscal Year 2006 Phased Construction Completion Report for the Zone 2 Soils, Slabs, and Subsurface Structures (Exposure Unit 22-42) at East Tennessee Technology Park, Oak Ridge, Tennessee (DOE/OR/01- 2317&D2/A2/R1)	
193	5/18/2023	Urquhart- Foster, EPA & Young, TDEC	Henry & Petrie, DOE	Henry & Petrie, DOE Transmittal of the response to comments on the Addendum to the Removal Action Work Plan for the Y- 12 Facilities Deactivation/Demolition Project, OR: Alpha-2 Complex Demolition (DOE/OR/01- 2479&D1/A13/R2)	
194	5/18/2023	Urquhart- Foster, EPA & Young, TDEC	Petrie, DOE	Submittal of an Erratum To The Lower Watts Bar Reservoir and Clinch River- Poplar Creek Watershed Remedial Action Report Comprehensive Monitoring Plan, Oak Ridge (DOE/OR/01-1820&D3)	
195	5/18/2023	Petrie, DOE	Urquhart-Foster, EPA	EPA Approval - Notice of a Non- Significant Change to the ROD for Phase I Interim Source Control Actions in Upper East Fork Poplar Creek Characterization Area (DOE-OR-01- 1951&D3)	DOEIC, Notified board officers of receipt
196	5/18/2023	Petrie, DOE	Urquhart-Foster, EPA	EPA Comments - The Federal Facility Agreement Proposed Appendix J	DOEIC, Notified board officers of receipt



#	Date	То	From	Description	DOEIC, Notified board officers of receipt
197	5/22/2023	Urquhart- Foster, EPA & Young, TDEC	Felosi & Petrie, DOE	Transmittal of The Phased Construction Completion Report for Remaining Pre-Demolition Activities and Demolition of the 3010 Reactor Complex at The Oak Ridge National Laboratory, Oak Ridge, Tennessee (DOE-OR-01-2944&D1)	DOEIC, Notified board officers of receipt
198	5/24/2023	Petrie, DOE	Young, TDEC	TDEC Comment Letter: 2023 Remediation Effectiveness Report for the U.S. Department of Energy Oak Ridge Site, Oak Ridge Tennessee (DOE/OR/01-2938&D1)	DOEIC, Notified board officers of receipt
199	5/24/2023	Shields, ORSSAB	Wilkerson, DOE	Final Response to Letter Entitled, Recommendation 253: On The FY 2025 OREM Program Budget Priorities	DOEIC, Notified board officers of receipt
200	5/24/2023	Felosi, DOE	Saunders, UCOR	Section J, Attachment J-8: Government-Furnished Services and Information, Request for Comprehensive Environmental Response, Compensation, and Liability Act Document Approvals: Phased Construction Completion Report for Pre-Demolition of the Graphite Reactor Support Facilities and Building 3005, the Low Intensity Test Reactor at the Oak Ridge National Laboratory, Oak Ridge, Tennessee (DOE/OR/01- 2946&D1)	DOEIC, Notified board officers of receipt
201	5/24/2023	Urquhart- Foster, EPA & Young, TDEC	Cooke, DOE	Transmittal of The Draft Covenant Deferral Request for The Proposed Title Transfer of The Zone 1 Portion of The Black Oak Ridge Conservation Easement and Exposure Units Z1-77, Z1-78, And Z1-79 At the East Tennessee Technology Park, Oak Ridge, Tennessee (DOE/OR/01-2954)	DOEIC, Notified board officers of receipt



#	Date	То	From	Description	DOEIC, Notified board officers of receipt
202	5/25/2023	Petrie, DOE	: TDEC Approval Letter: Erratum to the Lower Watts Bar Reservoir and Clinch River Poplar Creek Watershed Young, TDEC Remedial Action Report Comprehensive Monitoring Plan, Oak Ridge, Tennessee (DOE/OR/01- 1820&D3)		DOEIC, Notified board officers of receipt
203	5/26/2023	Petrie, DOE	TDEC Comments: Transmittal of the Addendum to the Removal Action Work Plan for the Y-12 Facilities Young, TDEC Deactivation/Demolition Project, Oak Ridge, Tennessee: Beta-1 Complex Demolition (DOE/OR/01- 2479&D1/A14/R1)		DOEIC, Notified board officers of receipt
204	5/30/2023	Petrie, DOE	Amoroso, EPA	EPA Approval: Addendum 2 to the Fiscal Year 2006 Phased Construction Completion Report for the Zone 2 Soils, Slabs, and Subsurface Structures (Exposure Unit Z2-42) at East Tennessee Technology Park, Oak Ridge, Tennessee (DOE/OR/01- 2317&D2/A2/R1) (Z2-42 PCCR)	DOEIC, Notified board officers of receipt
205	5/31/2023	Urquhart- Foster, EPA & Young, TDEC	Transmittal of the Phased Construction Completion Report for Pre-Demolition of the Graphite Felosi & Petrie, DOE 3005, the Low Intensity Test Reactor at the Oak Ridge National Laboratory, Oak Ridge, Tennessee (DOE/OR/01- 2946&D1)		DOEIC, Notified board officers of receipt
206	6/1/2023	Urquhart- Foster, EPA & Young, TDEC	Hardin & Petrie, DOE	Transmittal of The Addendum 15 To the Remedial Design Report-Remedial Action Work Plan for Zone 2 Soils, Slabs, And Subsurface Structures at East Tennessee Technology Park Oak Ridge, Tennessee: Water Management in Exposure Unit Z2-13 (DOE/OR/01-2224&D5/A15/R1)	DOEIC, Notified board officers of receipt



#	Date	То	From	Description	DOEIC, Notified board officers of receipt
207	6/6/2023	Petrie, DOE	Young, TDEC	TDEC Comments: Transmittal of the Addendum to the Action Memorandum for the Y-12 Facilities Non-Time-Critical Removal Action Deactivation/Demolition Project, Oak Ridge, Tennessee (DOE/OR/01- 2462&D2/A1/R1) – submitted March 17, 2023	DOEIC, Notified board officers of receipt
208	6/6/2023	Petrie, DOE	Froede, EPA	EPA Comments: Fiscal Year 2023 Phased Construction Completion Report for the Oak Ridge Reservation Environmental Management Waste Management Facility (DOE/OR/01- 2941&D1)	DOEIC, Notified board officers of receipt
209	6/6/2023	Urquhart- Foster, EPA & Young, TDEC	Henry & Petrie, DOE	Transmittal of Phased Construction Completion Report for the Non-Time- Critical Removal Action Building 9404- 18 Demineralizer Facility Mercury- Contaminated Systems Demolition at the Y-12 National Security Complex, ORR (DOE/OR/01-2929&DI)	DOEIC, Notified board officers of receipt

Travel Opportunities

Meeting/Event	Dates	Location	Cost	Additional Info
	FY	2023		
RadWaste Summit Requests: Shields, Bartholomew	June 6-8	Las Vegas, NV	\$1,075	http://www.radwastesummit.com/
EPA National Brownfields Conference Requests:	Aug. 8-11	Detroit, MI	TBD	https://brownfields2023.org/
DOE National Cleanup Workshop Requests: Jones , Anzelotti, Butler , Dill	Sept. 11-13	Alexandria, VA	\$1,075	www.cleanupworkshop.com
2023 Fall Chairs Meeting Requests: NA, all invited to attend	Oct.	Oak Ridge	NA	
ORSSAB Annual Meeting All members invited to attend	твр		NA	
	FY	2024		
Waste Management Symposium Requests:	March 10-14	Phoenix, AZ	твр	www.wmsym.org
National Environmental Justice Conference & Training Requests:	April 16-18	Washington, D.C.	NA	http://thenejc.org
Spring Chairs Meeting Board officers preferred Requests:	TBD	Nevada	NA	
Shaded trips are closed	Due to the complexity of arranging government travel, please indicate your interest as soon as possible. Some events may book up to a year in advance. If more members request to travel than an event will allow, the Executive Committee will choose attendees.			



This Proposed Plan describes:

- Residual contamination in groundwater in the K-31/K-33 Area at the East Tennessee Technology Park (ETTP).
- Current and future human health risks from groundwater in the K-31/K-33 Area at ETTP.
- Remedial action alternatives evaluated in the Remedial Investigation/Feasibility Study Report for the K-31/K-33 Area at the East Tennessee Technology Park, Oak Ridge, Tennessee (DOE/OR/01-2893&D2).
- The preferred remedial action alternative for groundwater in the K-31/K-33 Area at ETTP as monitored natural attenuation.
- How to participate in selecting or modifying the preferred remedial action alternative, including а public meeting on month/day/year and а 45-day public beginning comment period on month/day/year ending and on month/day/year.
- Where to get more information.

U.S. Department of Energy Environmental Management Program DOE/OR/01-2922&D2

Proposed Plan for the Record of Decision for Groundwater in the K-31/K-33 Area at the East Tennessee Technology Park, Oak Ridge, Tennessee

YOUR OPINION IS INVITED

The U.S. Department of Energy (DOE) invites you to express your opinion of the presented remedial alternatives and the preferred alternative for K-31/K-33 Area groundwater at the East Tennessee Technology Park. You are encouraged to read the *Remedial Investigation/Feasibility Study Report for the K-31/K-33 Area at the East Tennessee Technology Park, Oak Ridge, Tennessee* for more detailed background and technical information. A comment form is attached to this Proposed Plan, but you are not restricted to this form. Decision makers will consider any comments received before the end of the public comment period.

Community involvement is critical the to Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, cleanup process. DOE has established a 45-day public comment period, during which time local residents and interested parties can express their views and concerns on this Proposed Plan. DOE will schedule a public meeting to discuss remedial action alternatives and to address questions and concerns the public may have.

This document has been reviewed and confirmed to be UNCLASSIFIED and contains no UCNI. <u>Name: Dave Lannom</u> <u>Date: 02/20/2023</u> <u>UCOR eDC/RO ID: 32599</u>

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1. INTRODUCTION

presents This Proposed Plan the U.S. Department of Energy's (DOE's) preferred remedial action alternative for K-31/K-33 Area groundwater at the East Tennessee Technology Park (ETTP), located on the Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee (Figure 1). The preferred alternative is monitored natural attenuation (MNA), which is a groundwater remediation approach that relies on natural processes to decrease or attenuate concentrations of contaminants in groundwater. MNA was selected to address chromium and nickel contamination in K-31/K-33 Area groundwater. Although chromium and nickel have been detected above drinking water standards, overall concentrations have exhibited a downward trend since monitoring began in the late 1980s, and there are no current exposure pathways that affect human health or the environment.

The purposes of this Proposed Plan are to describe the remedial action alternatives analyzed, identify the preferred remedial action alternative, explain the rationale for the preferred remedial action alternative, and solicit public involvement. Additional information on the descriptions and evaluation of the remedial action alternatives can be found in the *Remedial Investigation/Feasibility Study Report for the K-31/K-33 Area at the East Tennessee Technology Park, Oak Ridge, Tennessee* (DOE/OR/01-2893&D2; Remedial Investigation [RI]/Feasibility Study [FS]).

This Proposed Plan is a document that DOE, as the lead agency, is required to issue to fulfill public participation requirements under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 117(a), as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 United States Code Section 9601 et seq.) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] 300.430[f][2]).

Remediation efforts on the ORR are governed by the Federal Facility Agreement for the Oak Ridge Reservation (DOE/OR-1014; Federal Facility Agreement [FFA]). DOE is the lead agency for this Environmental Proposed Plan. The U.S. Protection Agency (EPA) Region 4 and the State of Tennessee's Tennessee Department of Environment and Conservation (TDEC) support issuance of this Proposed Plan. In accordance with the DOE Secretarial Policy Statement on the National Environmental Policy Act (DOE 1994), National Environmental Policy Act of 1969 (NEPA) values have been incorporated into the CERCLA documentation prepared for this project.

2. SCOPE OF PROPOSED REMEDIAL ACTION

For the purpose of evaluating and remediating groundwater, DOE has divided the ETTP site into three areas: K-31/K-33 Area, Main Plant Area, and Zone 1. This Proposed Plan addresses groundwater in the K-31/K-33 Area only (Figure 2). Groundwater in the other portions of ETTP will be addressed in separate CERCLA decision documents. The K-31/K-33 Area is west of the Main Plant Area at ETTP and is separated



Figure 1. Location of the ORR and ETTP.



Figure 2. CERCLA groundwater areas at ETTP.

from the Main Plant Area by Poplar Creek. It is bounded to the north and west by the Zone 1 area. The scope of the remedial action is limited to groundwater, which extends from the surface of the water table in the unconsolidated geologic zone down into and through the underlying bedrock zone.

Groundwater sampling results in recent samples (June 2021) from unconsolidated and bedrock wells have identified low levels of contamination (just above the maximum contaminant levels [MCLs] for nickel or chromium) in two monitoring wells along the eastern side of the K-31/K-33 Area. The contaminated groundwater was detected in an overburden well that is screened at a depth of 26 to 36 ft below ground surface and a bedrock well screened at a depth of 35 to 55 ft below ground surface.

Groundwater sampling in the area previously identified other contaminants above their respective MCLs, including the metals antimony, arsenic, beryllium, and lead, as well as the radiological parameter gross alpha activity. Concentrations of these other contaminants have been below the MCL in recent samples, but they will continue to be evaluated as part of the MNA remedy.

2.1 SITE BACKGROUND

2.1.1 Site Overview

The 34,465-acre DOE ORR is located within and adjacent to the corporate limits of the city of Oak Ridge, Tennessee, in Roane and Anderson Counties (Figure 1). The ORR is bounded to the east, south, and west by the Clinch River and on the north by the developed portion of the city of Oak Ridge. Three major industrial research and production facilities that originally were constructed as part of the World War II-era Manhattan Project-ETTP, formerly the K-25 Site and Oak Ridge Gaseous Diffusion Plant; Oak Ridge National Laboratory, formerly X-10; and the Y-12 National Security Complex (Y-12)—are located on the ORR.

ETTP occupies approximately 5000 acres of the ORR. Areas potentially impacted by site activities account for roughly 2200 of the 5000 acres. The original mission of ETTP was to enrich uranium using the gaseous diffusion process. From 1945 until 1964, ETTP produced highly enriched uranium for use in nuclear weapons. After 1964,

operations focused on producing low-enriched uranium for fabrication into fuel elements for commercial and research nuclear reactors.

2.1.2 Site History and Status

ETTP's principal mission was to enrich uranium. Enrichment activities ceased in 1987, and demolition of all buildings covered under CERCLA was completed in 2020. ETTP is currently being cleaned up to allow for reuse of the land and remaining infrastructure. Oak Ridge National Laboratory historically has performed, and continues to perform, a variety of research and development activities. includina use of research-scale nuclear reactors for DOE. Y-12 has served several missions, including uranium enrichment, lithium refining, nuclear weapons manufacturing, component and weapons disassembly. Y-12 still has continuing missions in some of these areas. Historical operations on the ORR have led to soil, surface water, sediment, groundwater, and buildings contamination. Consequently, the ORR, including all of ETTP, was placed on the CERCLA National Priorities List in 1989.

At the peak of operations in the 1950s and early 1960s, there were five process buildings—K-25, K-27, K-29, K-31, and K-33—that housed the gaseous diffusion equipment used for the enrichment process. Once the production of highly enriched uranium ceased in 1964, the K-25 and K-27 process buildings were shut down. The K-29, K-31, and K-33 buildings continued to produce low enriched uranium until 1985.

Secondary missions at ETTP, beginning in the 1970s and continuing untill plant shutdown, included research on new technologies for uranium enrichment, such as gas centrifuge and laser isotope separation. In 1985, because of a decline in the demand for low enriched uranium, DOE placed ETTP in standby mode. ETTP was shut down permanently in 1987. Currently, DOE activities at ETTP include environmental cleanup and reindustrialization efforts. Portions of ETTP are used for non-DOE industrial activities.

ETTP operations resulted in a legacy of inactive and contaminated facilities, waste disposal areas, and contaminated media, including the following:

- Buildings
- Buried waste

- Buried tanks
- Underground waste lines
- Scrap and debris
- Contaminated surface and subsurface soil
- Contaminated surface water and sediment
- Contaminated groundwater

The initial environmental investigations at ETTP were completed in the late 1980s to meet the requirements of the Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984. After the ORR was listed on the National Priorities List, environmental work at ETTP was driven by CERCLA requirements. The first set of key CERCLA decisions addressed single-project, higher risk, early actions to remove primary sources of contamination or address primary release mechanisms. In addition, buildings have been demolished under CERCLA removal authority. The early actions and facility demolition are complete.

The second set of key decisions at ETTP addressed soil, buried waste, and subsurface structures. ETTP was divided into two geographical areas to support the evaluation and follow-on remediation of these media: Zone 1, consisting of approximately 1,400 acres outside the original fence line of the main processing/industrial area; and Zone 2, the processing/industrial area inside the original fence line. Historically, Zone 1 was mostly undeveloped, but portions were used for industrial purposes (e.g., power generation) and limited waste disposal. Zone 2 is the Main Plant Production Area associated with uranium enrichment and supporting operations, as well as waste treatment and disposal.

Characterization and remedial actions for soil, buried waste, and subsurface structures in Zone 1 were implemented under the Record of Decision for Interim Actions in Zone 1. East Tennessee Technology Park, Oak Ridge, Tennessee (DOE/OR/01-1997&D2; Zone 1 Interim Record of Decision [IROD]). Remedial actions in Zone 2 are conducted in accordance with the Record of Decision for Soil, Buried Waste, and Subsurface Structure Actions in Zone 2. Oak Ridge. (DOE/OR/01-2161&D2; Tennessee Zone 2 Record of Decision [ROD]). Remedial actions under the Zone 1 IROD and Zone 2 ROD were based on the protection of both human health and

underlying groundwater, but neither ROD included actions that extend below the water table (or below the top of bedrock).

The Amendment to the Record of Decision for Interim Actions in Zone 1 for Final Soil Actions. East Tennessee Technology Park, Oak Ridge, (DOE/OR/01-2817&D3) Tennessee added protection of ecological receptors in the terrestrial environment, given that much of Zone 1 is essentially undeveloped and, thus, a viable ecological habitat. The amendment also added protection of recreational receptors, as much of the undeveloped area is managed as a conservation easement by the Tennessee Wildlife Resources Agency. All of the Zone 1 remedial actions are complete. Remedial actions in Zone 2 are in progress and planned to be completed in 2024.

The remaining CERCLA decisions at ETTP will address contamination in groundwater, surface water, and sediment in the ponds, wetlands, and perennial streams in Zones 1 and 2. These decisions will include protection of ecological receptors in aquatic environments (i.e., ponds, streams) as appropriate. CERCLA decisions for the sediment in Poplar Creek, which borders the eastern and southern edges of the K-31/K-33 Area, were addressed in the Record of Decision for the Clinch River/Poplar Creek Operable Unit. Oak Ridge, Tennessee (DOE/OR/02-1547&D3). A future ROD will be issued for surface water in Poplar Creek (and the Clinch River) upon completion of the CERCLA-driven cleanup work in the ORR.

CERCLA decisions for groundwater at ETTP will be based on the three geographical areas described above:

- Main Plant Area groundwater IROD (followed by a subsequent final decision document)
- K-31/K-33 Area groundwater ROD
- Zone 1 groundwater ROD

The CERCLA decision for surface water, sediment, and aquatic ecological receptors at ETTP (exclusive of Poplar Creek) will be addressed in the following decision:

 Remaining Ecology/Surface Water/Sediment Final ROD The anticipated end uses in the K-31/K-33 Area are industrial, which is consistent with the Covenant Deferral Request transferring the land to the Community Reuse Organization of East Tennessee. Currently, the K-31 area is being leased as a support facility to the Y-12 Uranium Processing Facility construction project, and the K-33 footprint has been sold to Kairos Power who plans to use it for a nuclear energy demonstration reactor.

Future use of the groundwater in the K-31/K-33 Area is improbable and would require prior approval from DOE, EPA, and TDEC before implementation. Groundwater would be of limited use to future site developers due to the complex geology, the availability of the nearby Clinch River as a water source, and the availability of the existing municipal water supply. Future residential use of the K-31/K-33 Area is prohibited through land use controls (LUCs) established under the Zone 2 ROD.

2.1.3 Site Characteristics

The K-31/K-33 Area was located in the northwestern portion of ETTP. The K-31/K-33 Area occupied approximately 200 acres bounded by Poplar Creek on the east and south, the K-901-A Holding Pond to the west, and Black Oak Ridge to the north. The area included the former locations of Buildings K-31 and K-33, which enriched uranium using the gaseous diffusion process (Figure 3). The area also included ancillary or support facilities (e.g., electrical switchyards and Recirculating Cooling Water facilities), as well as an extensive underground utility network.

Building K-31 began operation in 1951. Building K-33 was the last gaseous diffusion process building constructed at ETTP and began operations in 1954. All enrichment operations were discontinued in 1985, and Buildings K-31 and K-33 were shut down. Between 1998 and 2005, the process equipment was removed under the Action Memorandum for Equipment Removal and Building Decontamination for Buildings K-29. K-31. and K-33. East Tennessee Technology Park. Oak Ridge. Tennessee (DOE/ OR/02-1646&D1). Demolition of Buildings K-31 and K-33 was completed in 2015 under the Action Memorandum for the Remaining Facilities Demolition Project East at Tennessee Park, Technology Oak Ridge, Tennessee (DOE/OR/01-2049&D2). The soil in the

K-31/K-33 Area was evaluated and remediated, as required, under the Zone 2 ROD.

The K-31/K-33 Area was transferred to the Community Reuse Organization East Tennessee, and a portion subsequently was leased by Consolidated Nuclear Security, LLC in 2018 for use as an equipment staging area in support of the Uranium Processing Facility at the National Nuclear Security Administration's Y-12 facility. The property transfer was completed in accordance with approved Covenant Deferral Requests under CERCLA Section 120(h). The deed transferring the property to the Community Reuse Organization of East Tennessee contains restrictions for the K-31/K-33 Area that limit development of the property to industrial, commercial, or recreational uses and prohibit the extraction, consumption, exposure, or use, in any way, of the groundwater. The deed also restricts disturbances of the soil on the property of more than 10 ft below ground level.

Monitoring of groundwater guality in the K-31/K-33 Area has been ongoing since 1989 in 21 groundwater monitoring wells. As required by EPA and TDEC, groundwater sampling results are evaluated against Safe Drinking Water Act of 1974 (SDWA) MCLs. In the past 5 years, antimony, arsenic, beryllium, chromium, lead, and nickel have exhibited concentrations that exceeded their respective MCLs. In addition, of radiological parameters analyzed in the groundwater, gross alpha activity was detected above its MCL.

Historically, suspended solids in the groundwater samples (measured and reported as turbidity values) have impacted the results of the unfiltered groundwater samples from the K-31/K-33 Area wells. The turbidity data have shown that, oftentimes, there was an increase in the reported constituent concentrations corresponding to increased levels of turbidity in the samples. This relationship was further substantiated by the of MCL exceedances absence in the corresponding filtered samples (filtered samples, collected at the same time as unfiltered samples, are produced by passing the groundwater through a 40-micron filter before filling the sample jars). Following installation of dedicated low-flow sampling pumps in 2019, using an EPA-approved method to limit turbidity in groundwater samples the number of constituents that exceed MCLs was significantly reduced. In the most recent, groundwater sampling event (June 2021), MCL



Figure 3. K-31/K-33 Area, circa 2000.

exceedances were detected in samples from only 2 of the 20 wells that were sampled—BRW-030 (chromium) and UNW-083 (nickel). Figure 4 shows the locations of the two wells with the June 2021 MCL exceedances.

Potential releases of chromium and nickel in the K-31/K-33 Area occurred from leaks in the Recirculating Cooling Water piping and firewater system, leaks in the cooling tower basins, mist from the cooling water towers, and flushing of the firewater system hydrants. The Recirculating Cooling Water system and the firewater system used a corrosion-inhibitor additive that contained hexavalent chromium. Based on historical concentrations of nickel observed in the cooling Water also was a potential source for nickel due to the wide-scale use of nickel in the process piping and equipment. The cooling tower basins were demolished between 1994 and 1996.

Soils and subsurface infrastructure (e.g., Recirculating Cooling Water basins) were evaluated as required under the Zone 2 ROD and were determined to require no further action following completion of demolition activities. These evaluations, completed between 2007 and 2015, did not identify any areas that could be considered an ongoing or future source of groundwater contamination.

3. SUMMARY OF SITE RISKS

A baseline human health risk assessment was performed for exposures to groundwater as part of the K-31/K-33 Area RI/FS. Although the Zone 1 IROD and Zone 2 ROD include LUCs that prohibit the use of groundwater as a source of potable water at ETTP, the CERCLA process requires a quantitative evaluation of risks related to potential exposures to groundwater through a variety of pathways, including use of groundwater as a potable water supply.

The risk assessment evaluated exposures for two potential receptors: a future industrial worker; and, as required by EPA, a hypothetical future resident (the Zone 1 IROD and Zone 2 ROD also prohibit residential development of ETTP). In both cases, the risk assessment assumed these receptors would use the groundwater as a potable drinking water source. In addition to ingesting groundwater, both receptors also are potentially exposed to groundwater contaminants via dermal exposure and inhalation of volatiles. The calculated exposure point concentrations representing the 95% upper confidence limit (UCL) on the mean value were developed using all wells at the K-31/K-33 Area.

Results from the risk assessment identified hexavalent chromium as the principal contributor to an estimated increased lifetime cancer risk (ILCR) that exceeds the 1E-04 target risk threshold for both the industrial worker receptor and the hypothetical residential receptor. Estimated ILCRs were 2E-04 for the industrial worker and 1E-03 for the hypothetical resident. In addition, the UCLs exceeded the MCL for chromium and nickel.

An evaluation also was performed looking at the wells individually. The metals aluminum, arsenic, beryllium, cadmium, cobalt, hexavalent chromium, fluoride, iron, lithium, manganese, selenium, thallium, uranium, and vanadium were identified as contaminants of concern (COCs) in one or more of the individual wells because COC-specific hazard indices were greater than 1 or the metals contributed to a hazard index greater than 1 for a similar target organ/critical effect for a hypothetical resident. A subset of the metals (arsenic, cobalt, manganese, thallium, and vanadium) was identified as COCs in one or more wells for industrial workers.

In addition to the risk assessment results, groundwater data (including data from dedicated, low-flow sampling pumps starting in 2019) and evaluation of process knowledge from the K-31/K-33 Area indicate chromium and nickel have been the most commonly occurring constituents, with concentrations exceeding MCLs. As a result, chromium (including both total chromium and hexavalent chromium) and nickel are considered to be the primary COCs for groundwater in the K-31/K-33 Area.

Ecological risk associated with groundwater contamination was not quantitatively evaluated for the K-31/K-33 Area RI/FS. There are no ponds, springs, or perennial streams in the formerly industrialized, upland portion of the area that might receive discharging groundwater and provide habitat for ecological receptors. A spring and seep survey along the banks of Poplar Creek, completed by the U.S. Geological Survey in 1995, identified several minor seeps in the southern and southeastern portions of the K-31/K-33 Area. These seeps were primarily



Figure 4. Monitoring wells with MCL exceedances based on June 2021 sampling.

wet-weather conveyances with low, intermittent flow rates and are also unlikely to provide appreciable habitat value. Based on these conditions, groundwater is not associated with a complete exposure pathway for ecological receptors in the K-31/K-33 Area.

It is DOE's current judgment that the preferred alternative identified in this Proposed Plan, or one of the other active measures considered in this Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

4. REMEDIAL ACTION OBJECTIVES

EPA's *Guidance* for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA/540/G-89/004) defines remedial action objectives (RAOs) as "medium-specific or operable-unit specific goals for protecting human health and the environment." According to the NCP (40 CFR 300.430[e][2][i]), RAOs should specify the media involved, COCs, potential exposure pathways, and remediation goals.

The RAOs for groundwater are as follows:

- Restore groundwater to drinking water standards (federal and state).
- Prevent exposure of humans, including industrial and construction workers, via dermal contact, ingestion, and/or inhalation to groundwater containing COCs above protective levels and prevent on-site consumption of groundwater above MCLs or applicable state groundwater criteria that are applicable or relevant and appropriate requirements (ARARs).
- Prevent adverse impacts to surface water quality from migration of contaminated groundwater that could result in exceedances of applicable state or federal ambient water quality standards or impairing the usefulness of the surface water for its classified use.

The CERCLA NCP requires federal SDWA MCLs and non-zero MCL goals (MCLGs) be attained for all remedial actions for groundwaters that are current or potential sources of drinking water, where the MCLs/non-zero MCLGs are relevant and appropriate under the circumstances of the release (40 CFR 300.430[e][2][i][B]-[C]). TDEC 0400-40-03-.07(4)(b) designates all groundwater in the state as General Use Groundwater (except for groundwater that has been specifically designated otherwise); thus, this General Use Groundwater designation would apply to groundwater on the ORR. Groundwater designated as General Use must meet the state's numeric Water Quality Criteria under TDEC 0400-40-03-.03(1)(j) and (k) for surface waters classified as a Domestic Water Supply and must contain no other constituents that pose an unreasonable risk to public health or the environment (TDEC 0400-40-03-.08[2]). Water Quality Criteria set out in TDEC 0400-40-03-.03(1)(j) reflect the SDWA MCLs (see Table 1).

5. SUMMARY OF REMEDIAL ALTERNATIVES

Three remedial alternatives were developed and evaluated in the K-31/K-33 RI/FS:

- Alternative 1: No action
- Alternative 2: MNA and LUCs (DOE's preferred alternative)
- Alternative 3: Pump and Treat, MNA, and LUCs

The scope of the groundwater remedial action for the K-31/K-33 Area is based on the distribution and magnitude of groundwater contamination in the area. The focus is on locations where sampling over the past 5 years (2017–2022) has identified contamination above MCLs, primarily chromium and nickel.

There are 21 monitoring wells at the site, as shown in Figure 5, but 1 of the wells has been dry since the 1990s. Samples from nine of these wells have not had an MCL exceedance over the past 5 years. The remaining 11 wells are associated with intermittent MCL exceedances and will be the focus of monitoring and evaluation activities under Alternative 2. For Alternative 3, four wells with more persistent MCL exceedances are considered to be candidates for potential treatment (Figure 6).

Table 2 summarizes the major components, cost, and estimated time to achieve RAOs for each remedial action alternative. Alternatives 2 and 3 include additional components, such as performance monitoring and Five-Year Reviews (FYRs). These remedial action alternatives are described more fully in the RI/FS.

	TDEC MCL ^a		
Chemical	Value	Unit	
Alpha activity	15	pCi/L	
Antimony	0.006	mg/L	
Arsenic	0.010	mg/L	
Beryllium	0.004	mg/L	
Chromium (total)	0.1	mg/L	
Lead	0.005 ^{b,c}	mg/L	
Nickel	0.1 ^d	mg/L	

Table 1. Numeric criteria for K-31/K-33 Area groundwater

^aTDEC MCLs are listed in TDEC 0400-45-01. All federal non-zero MCL goals (MCLGs) are equivalent to their respective MCLs and are, therefore, not listed on this table. Currently, all federal MCLs are exactly the same as the TDEC MCLs; therefore, the federal MCLs are not listed here.

^bLead and copper are regulated by a treatment technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, then water systems must take additional steps.

^eIn addition to the MCL/treatment technique under the State's Safe Drinking Water Act of 1974 program (TDEC 0400-45-01), Tennessee also has a lead groundwater quality criterion of 0.005 mg/L for domestic water supply (TDEC 0400-40-03-.03).

"The U.S. Environmental Protection Agency has deleted both the MCL and the MCLG for nickel from the Code of Federal Regulations, which was vacated by a court ruling. Tennessee has retained the nickel MCL in its current regulations.

MCL = maximum contaminant level

TDEC = Tennessee Department of Environment and Conservation



Figure 5. Monitoring well locations for MNA (Alternative 2).



Figure 6. Groundwater pump and treat layout (Alternative 3).

Alternative	Description	Cost (\$)/Timeframe (years)
Alternative 1: No action	The no-action alternative was included to provide a baseline for comparison to other alternatives, as required by the National Oil and Hazardous Substances Pollution Contingency Plan. Under this alternative, no remediation, monitoring, or LUCs will occur. Future contamination trends will not be evaluated or reported.	Cost: \$0 Timeframe: Not applicable
Alternative 2: MNA and LUCs	Alternative 2 relies on naturally occurring processes to attenuate (reduce) the concentration, toxicity, or mobility of contaminants. These processes are closely monitored and evaluated over time to determine progress toward RAOs. LUCs will be implemented to prohibit the use of groundwater and provide notifications to future landowners concerning the presence of contaminated groundwater. The LUCs remain in place until RAOs are achieved. The estimated costs include installing and monitoring additional wells; however, the need for, number, and exact locations of additional wells will be addressed during development of the Remedial Action Work Plan.	Capital cost: \$131,000 Total present-worth cost: \$1.8 million Annual O&M present-worth cost: \$84,000 Timeframe: 15 years
Alternative 3: Pump and treat, MNA, and LUCs	Alternative 3 extracts and treats groundwater with the highest concentrations of chromium and nickel, targeting specific areas with more persistent exceedances of MCLs (Figure 6). MNA will be implemented in areas where monitoring well data have shown lower contaminant concentrations (and only intermittent MCL exceedances). Groundwater will be pumped out of specially constructed extraction wells. A dedicated water treatment plant will be constructed near the extraction wells to treat the extracted groundwater. The treatment process will consist of a bag filter (to remove suspended solids), followed by ion-exchange units that will use two different ion-exchange resins to remove the chromium and nickel. Treated water will be discharged to the Clinch River in accordance with the Clean Water Act and TDEC regulations. MNA and LUCs will be implemented as described with Alternative 2.	Capital cost: \$2,355,000 Total present-worth cost: \$11.2 million Annual O&M present-worth cost: \$882,000 Timeframe: 10 years

Table 2. Summary of remedial action alternatives

Note: Costs represent direct project costs only and do not include all program-level management and overhead burdens.

LUC = land use control MCL = maximum contaminant level

MNA = monitored natural attenuation

O&M = operations and maintenance

RAO = remedial action objective TDEC = Tennessee Department of Environment and Conservation

EXPLANATION OF NINE CERCLA EVALUATION CRITERIA

- 1. Overall Protection of Human Health and the Environment addresses whether a remedial action provides overall protection of human health and the environment. This criterion must be met for a remedial alternative to be eligible for selection.
- 2. Compliance with Applicable or Relevant and Appropriate Requirements addresses whether a remedial action meets all of the applicable or relevant and appropriate federal and state environmental requirements or provides grounds for invoking a waiver of the requirements. This criterion must be met for a remedial alternative to be eligible for selection.
- **3.** Long-term Effectiveness and Permanence considers the ability of an alternative to protect human health and the environment over time.
- 4. Reduction of Toxicity, Mobility, or Volume Through Treatment evaluates an alternative's use of treatment to reduce harmful effects of contaminants, their ability to move in the environment, and the amount of contamination present.
- 5. Short-term Effectiveness refers to potential adverse effects on workers, human health, and the environment during the construction and implementation phases of a remedial action.
- 6. Implementability refers to the technical and administrative feasibility of a remedial action alternative, including the availability of materials and services needed to implement the alternative.
- 7. **Cost** refers to an evaluation of the capital, operation and maintenance, and monitoring costs for each alternative, including present-worth costs.
- 8. State Acceptance indicates whether the state concurs with the preferred alternative.

The following is applied after comments are received on the Proposed Plan.

9. Community Acceptance assesses the general public response to the Proposed Plan following a review of public comments received during the public comment period. The remedial action is selected only after consideration of this criterion.

6. EVALUATION OF REMEDIAL ACTION ALTERNATIVES

CERCLA, Section 121, as amended, specifies statutory requirements for remedial actions. These requirements include protection of human health and the environment, compliance with ARARs, a preference for permanent solutions that incorporate treatment as a principal element to the maximum extent practicable, and cost effectiveness. To assess whether remedial action alternatives meet these requirements, the following nine criteria (EPA/540/G-89/004), identified in the NCP (40 CFR 300.430[f][2]), must be evaluated for each remedial action alternative (Section 300.430[e][9][iii]):

- Threshold criteria:
 - Overall protection of human health and the environment
 - Compliance with ARARs
- Balancing criteria:
 - Long-term effectiveness and permanence
 - Reduction of toxicity, mobility, or volume through treatment
 - Short-term effectiveness
 - Implementability
 - Cost
- Modifying criteria:
 - State acceptance
 - Community acceptance

The first two criteria are the threshold criteria that relate directly to statutory findings that must be documented in the ROD. The next five criteria, designated the primary balancing criteria, address the performance of the remedial action alternative and verify the remedial action alternative is realistic. The last two modifying criteria are taken into account after public comment is received on the Proposed Plan.

In addition to these evaluation criteria prescribed under CERCLA, DOE policy directs the substantive elements of analysis required under NEPA be incorporated into CERCLA decision documents (DOE 1994). Elements common to both CERCLA and NEPA include protectiveness, compliance with ARARs, long-term effectiveness and permanence, short-term effectiveness, and
cost. Additional NEPA values not specifically included in CERCLA criteria include socioeconomic impacts, environmental justice, and ecological impacts. The comparative analysis of the three remedial action alternatives is summarized in Table 3 and discussed below.

CERCLA criteria	Alternative 1: No action	Alternative 2: MNA and LUCs	Alternative 3: Pump and treat, MNA, and LUCs
Protection of human health and the environment	0	\bullet	
Compliance with ARARs	0	\bullet	\bullet
Long-term effectiveness and permanence	N/A	\bullet	\bullet
Reduction of toxicity, mobility, or volume through treatment	N/A	0	0
Short-term effectiveness	N/A	\bullet	
Implementability	N/A		0
Present-worth cost	\$0	\$1.8 million	\$11.2 million
Estimated time to achieve RAOs	N/A	15 years	10 years

Low O

Table 3. Summary of alternatives evaluation

Rankings are provided as qualitative descriptions of relative compliance with each alternative criterion.

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980 LUC = land use control

Moderate O

MNA = monitored natural attenuation

Relative ranking:

N/A = not applicable; criterion was not evaluated because it did not pass the threshold criteria

RAO = remedial action objective

6.1 OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

High (

Alternative 1 is not protective of human health and the environment because no action would be taken to reduce or monitor groundwater contamination levels, nor would LUCs exist to prevent exposures to the contaminated groundwater. Alternatives 2 and 3 were both considered to be protective of human health and the environment because groundwater contamination levels would be reduced either through extraction and treatment (Alternative 3) or through closely monitored natural attenuation processes. LUCs would be used to manage risks at the site until the RAOs are achieved under Alternatives 2 and 3.

6.2 COMPLIANCE WITH ARARS

Alternative 1 would not achieve the chemical-specific ARARs, which include all enforceable numerical standards. Alternatives 2 and 3 would be specifically designed and implemented to achieve ARARs.

6.3 LONG-TERM EFFECTIVENESS AND PERMANENCE

Alternative 1 was not assessed for this criterion because it did not pass the threshold criteria for protection of human and the environment or compliance with ARARs. For Alternatives 2 and 3, long-term effectiveness and permanence are comparable, as both alternatives result in the permanent removal of contamination. Alternative 3 accomplishes this removal through extraction of contaminated groundwater with aboveground treatment that transfers the contaminants to treatment media that will be disposed of in compliance with ARARs. Alternative 3 permanently removes contamination from K-31/K-33 Area groundwater.

Alternative 2 relies on naturally occurring attenuation processes, primarily adsorption and precipitation, to transfer contaminants from groundwater onto aquifer matrix materials (soil and bedrock surfaces). Contaminant concentrations are expected to decrease over time until RAOs are achieved, which is estimated to require 15 years for Alternative 2 and 10 years for Alternative 3.

During this time, the progress will be assessed and LUCs will remain in place. The long-term risks associated with both alternatives are considered acceptable, although the risks are slightly higher with Alternative 2 because active treatment is not performed and contaminant levels will take longer to reach MCLs. The detailed analysis of alternatives indicates both Alternatives 2 and 3 are comparable for this criterion.

6.4 REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

Alternative 1 was not assessed for this criterion because it did not pass the threshold criteria. Alternative 3 uses active treatment with physiochemical treatment processes and natural attenuation, whereas Alternative 2 relies solely on attenuation. Attenuation is generally considered passive treatment. More contaminant mass is expected to be removed from groundwater with Alternative 3, although both alternatives will achieve RAOs. Both alternatives reduce contaminant mass, though Alternative 3 results in treatment residuals (spent ion exchange resins) that will require further management. The detailed analysis of alternatives indicates both Alternatives 2 and 3 are comparable for this criterion.

6.5 SHORT-TERM EFFECTIVENESS

Alternative 1 was not assessed for this criterion because it did not pass the threshold criteria. There are more risks to remediation workers with Alternative 3, as compared to Alternative 2, due to the increased construction activities and need for continuous operation of the treatment plant. Both alternatives can be implemented in a manner that protects the community. The environmental footprint of Alternative 3 is greater than that of Alternative 2 due to the electricity, material, and chemical demands of the treatment system that is expected to operate for 10 years. The detailed analysis of alternatives indicates both Alternatives 2 and 3 are comparable for this criterion.

6.6 IMPLEMENTABILITY

Alternative 1 was not assessed for this criterion because it did not pass the threshold criteria. Alternative 3 has more construction elements than Alternative 2, resulting in potential for operational challenges. Existing greater groundwater extraction systems at the Main Plant Area have resulted in fouling of extraction wells and pipelines, which could also occur at the K-31/K-33 Area. Alternative 3 was judged to be more susceptible to schedule impacts related to potential difficulties in maintaining efficient operation of the groundwater extraction system. Both alternatives can be implemented in a manner that would not limit additional remedial actions, should they be considered necessary in the future. Both alternatives have similar monitoring well requirements, but Alternative 3 requires more monitoring to verify pump-andtreat performance, compliance with surface water discharge requirements, and ongoing evaluation of treatment system performance. Alternative 3 has a greater impact on the future use of the property due to the need of installing pump-andtreat infrastructure (i.e., conveyance piping, treatment system, and utilities). The detailed analysis of alternatives indicated Alternative 2 scored higher than Alternative 3 for this criterion.

6.7 COST

Alternative 1 was not assessed for this criterion because it did not pass the threshold criteria. The capital costs and net present-value costs for Alternative 2 and Alternative 3 are shown in Table 2. Alternative 3 costs are significantly greater than those for Alternative 2 due to the need for construction and operation of extraction wells, a groundwater treatment plant, and related infrastructure. The costs for Alternative 2 include installing and monitoring additional wells to support the MNA evaluation. The need for, number, and exact locations of these additional wells will be addressed during development of the Remedial Design Report, in consultation with TDEC and EPA.

6.8 STATE ACCEPTANCE

State involvement has been solicited throughout the CERCLA-based remedy selection process. TDEC supports the preferred alternative (Alternative 2: MNA and LUCs), and its final concurrence will be solicited following review of all comments received during the public comment period.

6.9 COMMUNITY ACCEPTANCE

Community acceptance will be evaluated after the public comment period for this Proposed Plan.

6.10 ALTERNATIVE COMPARISON SUMMARY

In summary, Alternative 1 fails both threshold criteria-overall protection of human health and the environment, and compliance with ARARs; therefore, it was eliminated from further analysis. Alternatives 2 and 3 both pass the threshold criteria and generally are equivalent for the balancing criteria of long-term effectiveness; reduction of toxicity, mobility, or volume through treatment: and short-term effectiveness. Alternative 2 is superior for the balancing criteria of implementability and cost, and it is more readily implemented and less expensive to construct and operate. Alternative 2 avoids the operational challenges associated with groundwater extraction systems and its performance is easily monitored using conventional field and laboratory methods.

EPA and TDEC involvement have been solicited throughout the CERCLA-based remedy selection process. EPA and TDEC support the preferred alternative (Alternative 2: MNA and LUCs), and their final concurrence will be solicited following the review of all comments received during the public comment period. Community acceptance will be evaluated after the public comment period for this Proposed Plan.

7. SUMMARY OF PREFERRED ALTERNATIVE

7.1 DESCRIPTION OF THE PREFERRED ALTERNATIVE

Based on comparative analysis results and consideration of all information currently

available, DOE has determined that Alternative 2: MNA and LUCs is the preferred remedial action alternative to address contaminated groundwater in the K-31/K-33 Area at ETTP. This alternative is recommended because it will achieve the RAOs within a reasonable timeframe and its performance is easily measured.

Given the relatively low levels of contamination and the absence of current exposures to this contamination, DOE believes MNA and LUCs are a cost-effective approach to cleaning up the groundwater, as required by CERCLA and TDEC regulations. DOE also recognizes the preferred alternative may change in response to public comment, which is being solicited through this Proposed Plan.

The components of Alternative 2 are described below.

7.1.1 MNA

MNA relies on natural processes that reduce or "attenuate" contaminant concentrations in groundwater. These processes may also reduce the toxicity or mobility of the contaminants. Using MNA as the remedial action essentially involves continuous monitoring of groundwater conditions to measure and evaluate progress toward achieving RAOs. The natural processes applicable to chromium, nickel, and inorganic contaminants in groundwater include:

- bio-reactions (biogeochemical reduction)
- abiotic reactions (sorption and geochemical reduction)
- advection and dispersion

EPA and the Interstate Technical and Regulatory Council provide guidance on evaluating site conditions and groundwater monitoring data to verify the attenuation processes are performing as expected and to measure progress toward groundwater cleanup (EPA 2007a, 2007b, 2015; ITRC 2010).

A groundwater monitoring program based on the MNA guidance will be used to track remedy performance. Monitoring program design will commence with a tri-party data quality objectives effort that will focus on monitoring locations, the need for installing additional monitoring wells, the frequency of sampling, and the specific constituents to be monitored. The data quality objective will also address methods for evaluating monitoring data and may include if-then decision statements and contingency actions to help guide the program if future monitoring results indicate the remedy is not performing as expected. The agreed-upon scope for the monitoring program will form the basis of the Remedial Action Work Plan (RAWP) to be prepared following ROD completion.

Potential impacts resulting from the discharge of K-31/K-33 Area groundwater directly into Poplar Creek will be evaluated during implementation of the MNA remedy to satisfy an RAO of protecting surface water. Details concerning the scope of any required surface water monitoring will be defined during development of the RAWP.

Monitoring will begin once EPA and TDEC approve the RAWP. Results will be reported in annual Remediation Effectiveness Reports that DOE prepares as required by the FFA. These annual reports also are submitted for EPA and TDEC review and approval.

Groundwater modeling was used to estimate the timeframe for MNA processes to reduce contaminant concentrations below MCLs. Based on this modeling, MCLs will be achieved in approximately 15 years. Locations with lower levels of contamination are expected to achieve MCLs before this time. Well abandonment (decommissioning) will occur at the end of the project. Wells will be decommissioned via grout placement, with all aboveground well infrastructure removed.

7.1.2 LUCs

LUCs will be implemented in parallel with the MNA action as an additional protective measure to minimize potential exposures to contaminated groundwater. The LUCs will remain in place until RAOs are achieved.

For the K-31/K-33 Area, LUCs prohibit using groundwater for any purpose and may include additional requirements for constructing buildings until groundwater RAOs are achieved. LUCs will be implemented in accordance with the East Tennessee Technology Park Administrative Watershed Remedial Action Report Comprehensive Monitoring Plan, Oak Ridge, Tennessee (DOE/OR/01-2477&D4; Remedial Action Report [RAR] Comprehensive Monitoring Plan [CMP]), which includes the LUC Implementation Plan. The LUC Implementation Plan is outlined in Chapter 6 of the RAR CMP, detailed in Appendix D of the RAR CMP, and includes the following applicable LUCs:

- Property Record Restrictions
- Property Record Notices
- Excavation-Penetration Permit Program
- Access controls

The RAR CMP also includes guidelines for transferring property and verifying and reporting LUCs.

7.1.3 FYR

CERCLA requires site conditions be evaluated every 5 years until contamination levels are low enough to allow unlimited use and unrestricted exposures. For the K-31/K-33 Area groundwater remedial action, FYRs will be conducted until groundwater contaminant concentrations are below MCLs. The first review will be prepared 5 years after the ROD is finalized and MNA monitoring activities have begun.

The purpose of the FYR, as stated in EPA's Comprehensive Five-Year Review Guidance (EPA 2001). is to evaluate remedy implementation and performance to determine if the remedy is or will be protective of human health and environment. Each FYR includes six components: (1) summary of community involvement, (2) document review, (3) data review and analysis, (4) site inspection, (5) interviews, and (6) protectiveness determination. Information gathered and evaluated for the first five components supports completion of the sixth component, the protectiveness determination for the remedy.

The protectiveness determination is based on answering the following questions:

- Is the remedy functioning as intended?
- Are the exposure assumptions, toxicity data, cleanup levels, and RAOs still valid?
- Has any other information come to light that could call into question the protectiveness of the remedy?

In addition to the protectiveness determination, the FYR will identify any issues affecting remedy performance and will recommend follow-up actions, if needed.

7.2 STATUTORY DETERMINATION

The preferred remedial action alternative meets the statutory requirements of CERCLA Section 121 for: (1) protection of human health and the environment, and (2) compliance with ARARs. The MNA action is cost effective and constitutes a permanent solution to the groundwater contamination problem. Although active treatment measures are not part of the MNA remedy, the natural attenuation processes will achieve the same result; namely, reducing groundwater contamination to meet drinking water standards (MCLs).

8. NATURAL RESOURCE DAMAGES

The proposed remedy for K-31/K-33 Area groundwater is intended to remove contamination from the groundwater and allow its eventual beneficial use. DOE has no plans to leave hazardous substances above health-based levels in groundwater. Conversely, the CERCLA-driven soil cleanup of the K-31/K-33 Area under the Zone 2 ROD was based on a future industrial reuse of the area and was not intended to allow for unrestricted use/unlimited exposures.

Because potentially hazardous substances will remain in K-31/K-33 Area soils, it is recognized by DOE, TDEC, and EPA that Natural Resource Damage claims, in accordance with CERCLA, may be applicable. This document does not address restoration or rehabilitation of any natural resource injuries that may have occurred, or whether any such injuries have occurred. Neither DOE nor TDEC waives any rights or defenses they may have under CERCLA Section 107(1)4(c).

9. COMMITMENT TO LONG-TERM STEWARDSHIP

Areas within the K-31/K-33 Area at ETTP cannot support unrestricted use due to hazardous substances remaining in place after implementation of the selected remedy. Land use restrictions are required as part of this CERCLA action and will be achieved through LUCs that limit use and/or exposure to those areas of the property, including groundwater resources, that are contaminated. DOE is committed to implementing and maintaining LUCs, including institutional controls, to ensure the selected remedy remains protective of human health and the environment.

DOE, EPA, and TDEC have agreed upon a LUC Assurance Plan for the ORR to ensure the ongoing effectiveness of LUCs imposed in remedial actions protect human health and the environment from remaining contamination. The LUC Assurance Plan establishes regular inspection and reporting procedures designed to ensure each required LUC is properly implemented and maintained for as long as it is needed and that it continues to provide the expected level of protection.

10. COMMUNITY PARTICIPATION

DOE, EPA, and TDEC encourage the public to review this document and other relevant documents in the Administrative Record to gain an understanding of the ETTP K-31/K-33 Area and the proposed groundwater cleanup action. A copy of this Proposed Plan, as well as the entire Administrative Record, is located at the DOE Information Center, at the Office of Scientific and Technical Information, 1 Science.gov Way, Oak Ridge, Tennessee, 37830. The center is open Monday through Friday, 8 a.m. to 5 p.m.; the telephone number is (865) 241-4780.

DOE will establish a 45-day public comment period and schedule a public meeting to discuss the preferred alternative and address any questions or concerns from the public. The public meeting will be held at the DOE Information Center (see the previous paragraph for the address).

The public comment period will begin upon regulatory approval of the Proposed Plan, and the dates will be specified in DOE's public notice announcing the availability of the Proposed Plan and the dates for the public comment period. The announcement will include details regarding the public meeting.

DOE also encourages the public to submit comments on the proposed remedial action.

Comments may be provided at the public meeting or via email to OakRidgeEM@orem.doe.gov. Written comments may be addressed to the FFA Project Manager, Oak Ridge Environmental Management, DOE Oak Ridge Operations, Post Office Box 2001, Oak Ridge, Tennessee, 37831. Extensions to the comment period will be granted requested via email if to OakRidgeEM@orem.doe.gov or via written correspondence to the physical address provided above.

DOE will document and respond to comments as part of the ROD that will be issued after the public comment period.

11. REFERENCES

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- 40 CFR 300.430, et seq. *Remedial Investigation/ Feasibility Study and Selection of Remedy*, 2011, U.S. Environmental Protection Agency, Washington, D.C.
- 42 U.S.C. Section 9601, et seq. Superfund Amendments and Reauthorization Act of 1986, 1986, U.S. Environmental Protection Agency, Washington, D.C.
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- DOE/OR-1014. Federal Facility Agreement for the Oak Ridge Reservation, 1992, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.
- DOE/OR/01-1997&D2. Record of Decision for Interim Actions in Zone 1, East Tennessee Technology Park, Oak Ridge, Tennessee, 2002, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.
- DOE/OR/01-2049&D2. Action Memorandum for the Remaining Facilities Demolition Project at East Tennessee Technology Park, Oak Ridge, Tennessee, 2003, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.

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- DOE/OR/01-2477&D4. East Tennessee Technology Park Administrative Watershed Remedial Action Report Comprehensive Monitoring Plan, Oak Ridge, Tennessee, 2021, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.
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- DOE/OR/01-2893&D2. Remedial Investigation/ Feasibility Study Report for the K-31/K-33 Area at the East Tennessee Technology Park, Oak Ridge, Tennessee, 2022, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.
- DOE/OR/02-1547&D3. Record of Decision for the Clinch River/Poplar Creek Operable Unit, Oak Ridge, Tennessee, 1997, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.
- DOE/OR/02-1646&D1. Action Memorandum for Equipment Removal and Building Decontamination for Buildings K-29, K-31, and K-33, East Tennessee Technology Park, Oak Ridge, Tennessee, 1997, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.
- EPA 2001. Comprehensive Five-Year Review Guidance, EPA/540/R-01-007, U.S. Environmental Protection Agency, Washington, D.C.

- EPA 2007a. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water, Vol. 1, Technical Basis for Assessment, EPA/600/R-07/139, eds. R. G. Ford, R. T. Wilkin, and R. W. Pulps, U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, Cincinnati, OH.
- EPA 2007b. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water, Vol. 2, Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium, eds. R. G. Ford, R. T. Wilkin, and R. W. plus, U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, Cincinnati, OH.
- EPA 2015. Use of Monitored Natural Attenuation for Inorganic Contaminants in Groundwater at Superfund Sites, OSWER Directive 9823.1-36, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

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- EPA/540/R-00-002. A Guide to Developing and Documenting Cost Estimates During the Feasibility Study, July 2000.
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- Rules of the Tennessee Department of Environment and Conservation, Division of Water Resources, Chapter 0400-45-01, *Public Water Systems*, February 17, 2019.
- Rules of the Tennessee Department of Environment and Conservation, Division of Water Resources, Chapter 0400-40-03, *General Water Quality Criteria*, Rule 0400-40-03-.03, "Criteria for Water Uses"; Rule 0400-40-03-.07, "Ground Water Classification"; and Rule 0400-40-03-.08, Criteria.

12. GLOSSARY

Applicable or relevant and appropriate requirement (ARAR) – Those cleanup standards and other substantive requirements, criteria, or limitations promulgated under federal or more stringent state environmental or facility siting laws that are either legally applicable or relevant and appropriate to the hazardous substances, pollutant, contaminant, remedial action, location, or other circumstance found at the CERCLA site.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) – The federal law that establishes, among other requirements, a program for parties (including federal agencies) to identify; investigate; and, if determined necessary, remediate inactive site facilities contaminated with a hazardous substance, pollutant, or contaminant. It is also known as the Superfund law.

Feasibility study (FS) – The step in the CERCLA process in which alternatives for remediation of a contaminated site or of other remediation decisions are developed and evaluated.

Hazard index – The ratio of the level of exposure to an acceptable level of exposure for contaminants that may cause adverse health effects to humans. A cumulative hazard index greater than 1 indicates there may be a concern for adverse health effects. The hazard index is used to assess contaminants that may cause health effects other than cancer. Some contaminants (e.g., uranium, arsenic) can have both carcinogenic and non-carcinogenic effects.

Hazardous and Solid Waste Amendments of 1984 – The federal government's 1984 amendments to RCRA that focused on waste minimization and phasing out land disposal of hazardous waste. In addition to establishing corrective action requirements, the amendments included increased enforcement authority for EPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program.

Increased lifetime cancer risk (ILCR) – This risk considers the cumulative probability of humans developing cancer as a result of a lifetime of exposure to a particular level of a contaminant, above the normal cancer rates from the natural environment. Cumulative means adding the carcinogenic risk from all contaminants and ways a person can be exposed.

National Environmental Policy Act of 1969 (NEPA) – A federal law that requires federal agencies to consider and evaluate environmental impacts associated with any significant proposed actions or activities. For CERCLA actions undertaken by DOE, any impacts to NEPA values associated with the proposed action are considered along with other factors required to be evaluated.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP) – The federal government's blueprint for responding to both oil spills and hazardous substance releases. The NCP is the result of efforts to develop a national response capability and to promote coordination among the hierarchy of responders and contingency plans.

Present-worth – Present-worth costs reflect the quantity of money that would need to be placed in a bank today at a set interest rate, termed the discount rate, to pay for the remedial action over the life of the project. The present-worth approach for cleanup decision-making and comparison of alternatives is recommended by EPA in its cost-estimating guidance for Superfund sites (EPA/540/R-00-002, *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*, July 2000).

Proposed Plan – The formal document in which the lead agency identifies its preferred alternative for remedial action, explains why this alternative was preferred, and solicits comments from the public.

Record of Decision (ROD) – The formal document in which the lead agency sets forth the selected remedial action and the reasons for its selection.

Remedial investigation (RI) – A CERCLA environmental study that identifies the nature and extent of contamination. The RI also assesses the potential risks associated with the contaminants.

Resource Conservation and Recovery Act of 1976 (RCRA) – A federal law that established, among other requirements, a regulatory system for tracking hazardous waste from the time it is generated until disposal occurs. The law required EPA to promulgate regulations addressing the treatment, storage, and disposal of hazardous wastes that are considered protective of human health and the environment. These regulations (including the State counterparts) may be ARARs for the management of remediation wastes that are also considered hazardous under RCRA.

Superfund Amendments and Reauthorization Act of 1986 (SARA) – The federal law that amended CERCLA on October 17, 1986. SARA promoted permanent remedies for Superfund sites and encouraged the use of innovative treatment technologies, reflecting EPA's experience in administering the complex Superfund program during its first 6 years.

Safe Drinking Water Act of 1974 (SDWA) – The federal law established to protect the quality of public drinking water in the United States. This law focuses on all waters actually or potentially designated for drinking use, whether from aboveground or underground sources.

13. ACRONYMS

ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CMP	Comprehensive Monitoring Plan
COC	contaminant of concern
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
FFA	Federal Facility Agreement
FS	feasibility study
FYR	Five-Year Review
ILCR	increased lifetime cancer risk
IROD	Interim Record of Decision
LUC	land use control
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
MNA	monitored natural attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act of 1969
ORR	Oak Ridge Reservation
RAO	remedial action objective
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan
RI	remedial investigation
ROD	Record of Decision
SDWA	Safe Drinking Water Act of 1974
TDEC	Tennessee Department of Environment and Conservation
UCL	upper confidence limit
Y-12	Y-12 National Security Complex

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Proposed Plan for the Record of Decision for Groundwater in the K-31/K-33 Area at the East Tennessee Technology Park, Oak Ridge, Tennessee Public Comment Sheet

The U.S. Department of Energy (DOE) is interested in your comments on the alternatives being considered in this *Proposed Plan for the Record of Decision for Groundwater in the K-31/K-33 Area at the East Tennessee Technology Park, Oak Ridge, Tennessee*, including the preferred remedial action alternative. The mailing address is preprinted on the back of this form. You may use this form to submit your comments. We must receive your comments on or before the close of the public comment period. If you have questions, please contact Mr. Roger Petrie, FFA Project Manager; Oak Ridge Environmental Management; DOE Oak Ridge Operations; P.O. Box 2001, Oak Ridge, Tennessee, 37831; (865) 316-4063.

Name:	
Address:	
City:	_ State/Zip:
Phone:	

MAILING LIST ADDITIONS:

Please add my name to the Environmental Management Program mailing list to receive additional information on the progress at the Oak Ridge Reservation:

Place stamp here

Mr. Roger Petrie, FFA Project Manager Oak Ridge Environmental Management DOE Oak Ridge Operations P.O. Box 2001 Oak Ridge, TN 37831

DOE/OR/01-2922&D2

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Document Number:	Document Title:	
DOE/OR/01-2922&D1	Proposed Plan for the Record of Decision for Groundwater in the K-31/K-33 Area at the East Tennessee Technology Park,	
	Oak Ridge, Tennessee	
Name of Reviewer:	Organization:	Date Comments Transmitted:
Craig VanTrees	U.S. Environmental Protection Agency Region 4	12/13/22

Comment No.	Sect./Page	Comment	Response
	•	General	
1.	Guidance	Please ensure all applicable EPA Guidances are followed. All justifications for deviations from the EPA guidances must be documented in the Proposed Plan (PP).	Clarification. DOE prepared this Proposed Plan in accordance with the requirements of CERCLA and followed the relevant guidance documents as appropriate. DOE notes that page i of the ROD guidance contains the following statement:
			EPA administers nor their implementing regulations, nor is it a regulation itself. Thus, it does not impose legally- binding requirements on EPA, States, or the regulated community, and may not apply to a particular situation based upon the specific circumstances.
2.	BRW-030 and a Treatability Study:	One groundwater well does not satisfy the first tier (or line of evidence) for monitored natural attenuation (MNA) per the April 1999 Final OSWER Directive Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites OSWER Directive Number 9200.4-17P. Chromium concentrations in well BRW-030 have an increasing trend, opposed to a decreasing trend. Therefore, in the Proposed Plan the DOE presents four mechanisms to satisfy tiers 2 and 3 for MNA as follows: bio-reactions, abiotic reactions, advection, and dispersion. In appendix C of the Remedial Investigation/Feasibility Study Report for the K- 31/K-33 Area at the East Tennessee Technology Park, Oak Ridge, Tennessee (DOE/OR/01-2893&D2) (RI/FS), the DOE details these four mechanisms after acknowledging the chromium trend is increasing in BRW-030	Clarification. The overall contamination trends and the number of wells with MCL exceedances in the K-31/K-33 Area have been on a downward trend since monitoring began in the late 1980s. Chromium concentrations in the last two samples collected from BRW-030 were below the MCL. Even when the MCL was exceeded, concentrations have generally been less than twice the MCL. MNA is an appropriate response action given the low levels of contamination, absence of current exposure pathways, and lack of impacts to human health or the environment. As stated in Section 7 of the Proposed Plan, Summary of
		Monitoring data for BRW-030 should be evaluated at the beginning of the Remedial Design Work Plan (RDWP) phase of the project to determine if there is a stable or decreasing trend in contaminant concentration. At that time, if the contaminant trend for BRW-030 is still	Preferred Alternative, "A groundwater monitoring program based on the MNA guidance will be used to track remedy performance. Monitoring program design will commence with a tri-party data quality objectives effort that will focus on monitoring locations, the need for installing additional



Comment No.	Sect./Page	Comment	Response
		increasing, actions to supplement MNA will be needed because bio- reactions, abiotic reactions, advection, and dispersion alone are likely not sufficient to reach cleanup goals in the BRW-030 location. In this case, enhancement of the MNA remedy in localized area(s) will be needed, including a treatability study of <i>in situ</i> treatment process as a part of the RDWP and Remedial Design (RD).	monitoring wells, the frequency of sampling, and the specific constituents to be monitored. The data quality objective will also address methods for evaluating monitoring data and may include if-then decision statements and contingency actions to help guide the program if future monitoring results indicate the remedy is not performing as expected. The agreed-upon scope for the monitoring program will form the basis of the Remedial Action Work Plan (RAWP) to be prepared following ROD completion."
			DOE will continue to monitor and evaluate sampling results from BRW-030 in support of the remedial design and RAWP. Results from this monitoring and evaluation will be shared with EPA and TDEC.
3.	Re-calculating Exposure Point Concentrations:	The EPA requires that Exposure Point Concentrations (EPCs) be re- calculated following EPA guidances (<i>Determining Groundwater</i> <i>Exposure Point Concentrations, Supplemental Guidance.</i> OSWER Directive 9283.1-42. February 2014 and <i>ProUCL Version 5.2.0</i> <i>Technical and User Guides. Statistical Software for Environmental</i> <i>Applications for Data Sets with and without Nondetect Observations.</i> June 2022) at the beginning of the RDWP phase of the project. Additional monitoring data collected after the RI/FS was completed can be included in the re-calculation. [This comment doesn't impact the proposed plan.] It is unacceptable to calculate EPCs using data from wells outside an area of groundwater contamination or using data that are so old that they are no longer representative of groundwater quality. The text states "The calculated exposure point concentrations representing the 95% upper confidence limit (UCL) on the mean value were developed using all wells at the K-31/K-33 Area." This wording implies that data from wells outside identified locations of recent groundwater contamination were used to determine the EPCs. If the DOE did not follow the EPA's guidance, <i>Determining Groundwater Exposure Point Concentrations,</i> <i>Supplemental Guidance</i> (OSWER Directive 9283.1-42) in determining EPCs, the DOE must document why the guidance was not followed and which procedure was used to determine the EPCs that are representative of current groundwater contamination in the "core" or center of the plume. The need for restricting the EPC to the more highly contaminated part of a groundwater plume is based upon a conceptualization of	Clarification. DOE concurs that EPA guidance (EPA 2014) recommends that, for each COPC, the EPC should be based on the lesser of the 95% UCL or MDC calculated based on data collected from the core of a contaminant plume. Additionally, the guidance notes the approach is expected to be appropriate for a majority, but not all, sites. As noted by the reviewer, definable plume conditions are not present at the K-31/K-33 Area. Therefore, as described in the baseline HHRA, an alternative and health-conservative approach was used to calculate EPCs and baseline risks based on unfiltered and filtered datasets via 2 methods: (1) all applicable data available from the combined 20 wells at the K-31/K-33 Area that were collected from sampling rounds that occurred from 2017 through 2021, and (2) datasets determined for individual wells consisting of data collected from 2017 through 2021. SAS statistical software was employed to calculate statistics needed for determining EPCs by emulating algorithms and calculations used by ProUCL Version 5.1.002 (EPA 2015). EPCs determined from both methods of data aggregation were subsequently used to calculate risks for the hypothetical future resident and future industrial worker. Risks calculated based on individual wells are considered to be biased high due to elevated turbidity observed in the earlier sampling rounds and



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		groundwater contamination being in a definable plume. This condition does not seem to apply to the K-31/K-33 area; therefore, some alternative to this typical situation may apply.	the selection of the MDC as the EPC for 13 of the 20 wells due to small datasets. EPA's 2014 EPC guidance provides an approach for calculating the groundwater EPC for use in human health risk assessments; therefore, a recalculation at the beginning of the RDWP phase is not necessary. DOE used a health-conservative EPC calculation approach (i.e., relative to the cited guidance) to K-31/K-33 Area groundwater in the baseline HHRA, given that no discernable plumes are present. Recalculation of EPCs during post-ROD planning and design activities will be performed to provide integral information that will support the preferred alternative. The approach for performing this calculation will be reviewed as part of the DQO process supporting the RAWP.
4.	Referencing of Documents:	All reference documents must be properly cited and included in the reference section of the proposed plan. For example, a baseline human health risk assessment is mentioned on page 8 with no citation. Please review the proposed plan and ensure all documents are properly referenced.	Clarification. The risk assessment mentioned on page 8 was part of the K-31/K-33 Area RI/FS, which is initially cited in the Introduction (Section 1) and properly referenced in the list of references at the end of the document (Section 11). The first sentence of Section 3 has been revised as follows: "A baseline human health risk assessment was performed for exposures to groundwater as part of the K-31/K-33 Area RI/FS."
5.	Collection of additional data:	On December 12, 2022, the DOE confirmed that groundwater sampling at K-31/K-33 is currently conducted on a semi-annual basis. The EPA recommends quarterly collection of data to better address some comments presented in this letter. The monitoring frequency may, upon tri-party agreement, be adjusted at a later time in the project life cycle.	Agree. The semiannual sampling is conducted as part of DOE's Water Resources Restoration Program. DOE will shift the sampling frequency to a quarterly basis beginning in 2023. DOE also agrees that future monitoring frequency and monitoring parameters will be worked out in a tri-party DQO effort in support of the RAWP.
		Specific	
1.	Section 1, Introduction, Page 2:	Please revise the text to provide a brief summary description of the remedial alternatives considered in the detailed analysis per Section 3.3.1 (Introduction) of EPA's July 1999 <i>A Guide to Preparing Superfund</i>	Clarification. The existing text is consistent with Section 3.3.1 of the ROD guidance. As stated in the guidance document, the purpose of the introduction is to inform and solicit the views of citizens



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		Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (EPA 540-R-98-031) (the EPA Decision Guidance).	on the preferred alternative. The introduction is also intended to inform the public of the function of the proposed plan in the remedy selection process. The additional information identified in the comment is referenced in the introduction and included in later sections of this Proposed Plan.
2.	Section 1, Introduction, Page 2:	Please revise the text to explain the reason for the preference for MNA. The preferred alternative for remedial action is identified as MNA; however, the text does not explain the reason for the preference per the EPA Decision Guidance.	Agree. The first paragraph of the introduction has been revised with the addition of the shaded text shown below:
			"This Proposed Plan presents the U.S. Department of Energy's (DOE's) preferred remedial action alternative for K-31/K-33 Area groundwater at the East Tennessee Technology Park (ETTP), located on the Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee (Figure 1). The preferred alternative is monitored natural attenuation (MNA), which is a groundwater remediation approach that relies on natural processes to decrease or attenuate concentrations of contaminants in groundwater. MNA was selected to address chromium and nickel contamination in K-31/K-33 Area groundwater. Although chromium and nickel have been detected above drinking water standards, overall concentrations have exhibited a downward trend since monitoring began in the late 1980s, and there are no current exposure pathways that affect human health or the environment."
3.	Section 1, Introduction, Page 2:	In the second paragraph, please substitute "follows the requirements of" with "is a document that the DOE is required to issue to fulfill public participation requirements under".	Agree. The second paragraph has been revised as suggested in the comment. The revised text is shown below:
			"This Proposed Plan is a document that DOE, as the lead agency, is required to issue to fulfill public participation requirements under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 117(a), as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 <i>United States Code</i> Section 9601 et seq.) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 <i>Code of Federal Regulations [CFR]</i> 300.430[f][2])."



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4.	Section 2, Scope of	Please revise the text to discuss the specific depth of groundwater	Clarification.
	Proposed Remedial Action, Page 2:	contamination and provide a map and cross section figures so the vertical extent and scope of the problem is clearly presented.	Detailed figures and cross-sections of site conditions are provided in the RI/FS and are not necessary to be included in the Proposed Plan. A new paragraph with additional text on the depth of groundwater contamination has been inserted after the first paragraph in Section 2:
			"Groundwater sampling results in recent samples (June 2021) from unconsolidated and bedrock wells have identified low levels of contamination (just above the maximum contaminant levels [MCLs] for nickel or chromium) in two monitoring wells along the eastern side of the K-31/K-33 Area. The contaminated groundwater was detected in an overburden well that is screened at a depth of 26 to 36 ft below ground surface and a bedrock well screened at a depth of 35 to 55 ft below ground surface."
5.	Section 2, Scope of	Please revise Figure 1 to include the location of K-31/K-33. Please revise	Agree.
	Proposed Remedial Action, Page 3:	the figure frame to appropriately reflect the contents of the figure.	The K-31/K-33 Area has been identified on revised Figure 1 (which is attached to this table).
6.	Section 2, Scope of	In addition to chromium (total), hexavalent chromium should be listed as	Clarification.
	Proposed Remedial Action, Pages 2-8:	a chemical of concern (COC) since its excess lifetime cancer risk exceeded 1x10-4 (industrial and residential land use scenarios).	Section 3 is the most appropriate section to identify hexavalent chromium as a COC. The sixth paragraph in Section 3 has been revised in response to TDEC comment 3. Hexavalent chromium has been added as one of the primary COCs as shown below:
			"In addition to the risk assessment results, groundwater data (including data from dedicated, low-flow sampling pumps starting in 2019) and evaluation of process knowledge from the K-31/K-33 Area indicate chromium and nickel have been the most commonly occurring constituents, with concentrations exceeding MCLs. As a result, chromium (including both total chromium and hexavalent chromium) and nickel are considered to be the primary COCs for groundwater in the K-31/K-33 Area."



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7.	Section 2, Scope of Proposed Remedial Action, Pages 2-8:	Please revise the text to explain the exceedance of total polychlorinated biphenyls (PCBs). According to the groundwater results summarized in the RI/FS, total PCBs also exceeded its respective National Primary Drinking Water Regulations, Maximum Contaminated Level (MCL) of 0.5 micrograms per liter (μ g/L) with a maximum detection limit of 0.774 μ g/L.	Clarification. As stated in the RI/FS, PCBs have not been detected in groundwater in the K-31/K-33 Area. The laboratory analytical detection limit of 0.774 μ g/L for one sample collected in 2020 exceeds the MCL; however, laboratory results for the preceding sample from this well (BRW-032) with a detection limit well below the MCL (0.0353 μ g/L) indicate PCBs were not detected at the lower detection limit at this well. No additional text is needed in this Proposed Plan.
8.	Section 2, Scope of Proposed Remedial Action, Pages 2-8:	Please revise this section where appropriate to describe other sources of groundwater Contaminants of Concern (COCs). Although this section discusses the potential sources of chromium and nickel in groundwater, other sources of groundwater COCs were not discussed. There is also a lack of discussion of the radiological history.	Clarification. As documented in the RI/FS and summarized in this Proposed Plan, chromium (including hexavalent chromium) and nickel are the principal contaminants of concern based on the HHRA and comparison to MCLs. The RI/FS included a discussion of potential sources of other contaminants, including radionuclides. This Proposed Plan is focused on the constituents targeted by the preferred alternative, but performance monitoring for the MNA remedy will include monitoring for additional constituents, including other COCs historically detected in K-31/K-33 Area groundwater. Specific details for this monitoring will be developed during the DOO process and documented in the RAWP.
9.	Section 2, Scope of Proposed Remedial Action, Page 8:	Section 2.1.3 states, "In the past 10 years, antimony, arsenic, beryllium, chromium, lead, and nickel have exhibited concentrations that exceeded their respective MCLs." It is unclear why a 10-year cutoff was used when discussing any exceedance of the MCLs. According to the RI/FS, the EPCs for all wells were based on data collected from 2017-2021 (five years). Please explain the rationale for using a 10-year cutoff in the PP when a five-year cut-off is used in the RI/FS and revise the text appropriately.	Clarification. The 10-year period was used in some portions of the RI/FS to ensure sufficient data were available for the data trend analyses. However, text for this Proposed Plan has been revised to be consistent with the 5-year period used for calculation of EPCs in the HHRA. The list of constituents with MCL exceedances over the past 5 years is identical to those associated with the 10-year period. The sentence has been revised as follows: "In the past 5 years, antimony, arsenic, beryllium, chromium, lead, and nickel have exhibited concentrations that exceeded their respective MCLs."



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			A new figure (new Figure 4, which is attached to this table) has been added to Section 2.1.3 to better illustrate the scope of the groundwater contamination problem in the K-31/K-33 Area. The following sentence with a figure callout has been added to the end of the fifth paragraph in Section 2.1.3:
			"Figure 4 shows the locations of the two wells with the June 2021 MCL exceedances."
			Note that subsequent figure numbers have changed due to the insertion of new Figure 4.
10.	Section 3, Summary of Site Risks, Pages 8-9:	Please revise this section to distinguish between the terms hazard index and hazard quotient. It states, "The metals cobalt, iron, lithium, manganese, and nickel were identified as COCs in some individual wells based on a hazard index greater than 0.1, when the overall hazard quotient at a well exceeded 1.0, for both the industrial worker and the hypothetical resident." The terms of hazard index and hazard quotient should not be interchanged. The hazard quotient is the ratio of a single substance exposure level over a specified time period to its reference dose from a similar exposure period. The hazard index is the sum of two or more hazard quotients for multiple substances and/or multiple exposure pathways (EPA 1991).	Clarification. The uses of the terms hazard index and hazard quotient were inverted. COCs were identified in individual wells when the overall hazard index exceeded 1 for similar target organs or effects or when the individual hazard quotient exceeded 1. The text in the fourth paragraph in Section 3 has been revised to state: "The metals aluminum, arsenic, beryllium, cadmium, cobalt, hexavalent chromium, fluoride, iron, lithium, manganese, selenium, thallium, uranium, and vanadium were identified as contaminants of concern (COCs) in one or more of the individual wells because COC-specific hazard indices were greater than 1 or the metals contributed to a hazard index greater than 1 for a similar target organ/critical effect for a hypothetical resident. A subset of the metals (arsenic, cobalt, manganese, thallium, and vanadium) was identified as COCs in one or more wells for industrial workers."
11.	Section 3, Summary of Site Risks, Page 9:	Add a statement regarding any prior investigation of surface water near the K-31/K-33 Area and describe the results of monitoring for the identified groundwater COCs in the surface water.	Clarification. As summarized in Section 3.3 of the K-31/K-33 Area RI/FS, surface water sampling in Poplar Creek has been conducted in support of NPDES Permit requirements, including an evaluation of potential impacts to Poplar Creek from stormwater discharges during demolition of the K-31 and K-33 buildings and for the annual Remediation Effectiveness Report. Samples have been analyzed for PCBs, metals, mercury, hexavalent chromium, and gross alpha/gross beta.



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			This monitoring has not identified any impacts to water quality that can be attributed to groundwater discharge from the K-31/K-33 Area.
12.	Section 3, Summary of Site Risks, Page 9:	Please revise the text to discuss if the groundwater to surface water exposure pathway at K-31/K-33 Area will be addressed in the Remaining Ecology/Surface Water/Sediment Final ROD to ensure ecological risks will be sufficiently evaluated. The text states "Ecological risk was not evaluated for the K-31/K-33 Area because the site is an industrial area and groundwater is not an exposure	Clarification. The sixth paragraph in Section 3 has been revised, and a new paragraph has been added in Section 7.1.1, as shown below: "Ecological risk associated with groundwater contamination was not quantitatively evaluated for the K-31/K-33 Area
		pathway for ecological receptors." However, it is unclear if there is a groundwater to surface water contamination exposure pathway that exists that may impact ecological receptors. For example, one Remedial Action Objective (RAO) for groundwater states "Protect surface water quality by meeting applicable state ambient water quality criteria in surface water where groundwater discharges to surface water"; however, it is unclear if ecological impacts have been evaluated for the groundwater to surface water exposure pathway. It is noted the PP indicates the CERCLA decision for surface water, sediment, and aquatic ecological receptors at East Tennessee Technology Park (ETTP) (exclusive of Poplar Creek) will be addressed in the Remaining Ecology/Surface Water/Sediment Final ROD.	RI/FS. There are no ponds, springs, or perennial streams in the formerly industrialized, upland portion of the area that might receive discharging groundwater and provide habitat for ecological receptors. A spring and seep survey along the banks of Poplar Creek, completed by the U.S. Geological Survey in 1995, identified several minor seeps in the southern and southeastern portions of the K-31/K-33 Area. These seeps were primarily wet-weather conveyances with low, intermittent flow rates and are also unlikely to provide appreciable habitat value. Based on these conditions, groundwater is not associated with a complete exposure pathway for ecological receptors in the K-31/K-33 Area."
			The new paragraph added in Section 7.1.1 states: "Potential impacts resulting from the discharge of K-31/K-33 Area groundwater directly into Poplar Creek will be evaluated during implementation of the MNA remedy to satisfy an RAO of protecting surface water. Details concerning the scope of any required surface water monitoring will be defined during development of the RAWP."
13.	Section 3, Summary of Site Risks, Page 9:	In the fourth full paragraph, the Proposed Plan explains that certain chemicals were not included as COCs because they were not "site- related." Please omit this statement. The site risks and COCs described in the PP should be consistent with the HHRA.	Agree. The statement has been deleted from the sentence.
14.	Section 3, Summary of Site	The risk section of the PP does not conclude with the standard statement and language explaining the basis for taking action per Section 3.3.5 (Summary of Site Risks) of the EPA Decision Guidance. The following standard language explaining the basis for taking action is one example	Agree.



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	Risks, Page 9:	per Section 3.3.5 of the EPA Decision Guidance: "It is the lead agency's current judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment." Please revise the text in this section to conclude with the standard statement and language explaining the basis for taking action.	A new paragraph has been added at the end of Section 3 to include the language from Section 3.3.5 of the ROD guidance explaining the basis for taking action, as shown below: "It is DOE's current judgment that the preferred alternative identified in this Proposed Plan, or one of the other active measures considered in this Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment."
15.	Section 4, RAOs, Page 9:	 Revise the RAOs as follows: a. Revise bullet 1 to state "Restore groundwater to drinking water standards." Delete "to the extent practicable," as a technical impracticability waiver has not been sought or approved. b. Combine RAOs 2, 4 and 5 to: "Prevent exposure of humans, including industrial and construction workers, via dermal contact, ingestion, and/or inhalation to groundwater containing COCs above MCLs or state drinking water standards that are ARARs." c. RAO 3 is unclear and doesn't include all the elements typically incorporated into an RAO (contaminants, media, exposure pathway, receptors, and Preliminary Remediation Goals (PRG)/cleanup level). Please revise. For example: <i>Prevent migration of contaminated groundwater to surface water that could result in exceedances of applicable state or federal ambient water quality standards (ARARs) and (tie it back to the risk). Some possible options: ipose an unacceptable risk to human receptors through the ingestion of contaminated organisms. ii. <i>Pose an unacceptable risk to ecological organisms.</i> iii. <i>Degrade water quality based on its intended use.</i> </i> 	 Agree with clarification. a. The first RAO bullet has been revised to state the following: "Restore groundwater to drinking water standards (federal and state)." b. RAOs 2, 4, and 5 have been combined as requested: "Prevent exposure of humans, including industrial and construction workers, via dermal contact, ingestion, and/or inhalation to groundwater containing COCs above protective levels and prevent on-site consumption of groundwater above MCLs or applicable state groundwater criteria that are applicable or relevant and appropriate requirements (ARARs)." c. RAO 3 has been revised as suggested: "Prevent adverse impacts to surface water quality from migration of contaminated groundwater that could result in exceedances of applicable state or federal ambient water quality standards or impairing the usefulness of the surface water for its classified use."
16.	Section 4, Remedial Action Objectives, Page 10:	In Table 1, footnote a, the text in the second sentence mischaracterizes the relationship between the state and federal MCL. The correct relationship is that state requirements are identified as ARARs where they are more stringent than a corresponding federal requirement. Please remove this sentence. EPA does not object to the listing of the TDEC	Agree. The second sentence has been deleted from footnote 'a' to Table 1.



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		MCLs on Table 1, as TDEC has incorporated federal MCLs into its groundwater protection standards.	
17.	Section 5, Summary of Remedial Alternatives, Page 11:	The alternative recommended as the preferred alternative is not identified at the beginning of this section per Section 5 (Summary of Remedial Alternatives) of the EPA Decision Guidance. Please revise the text to clearly identify the alternative that is recommended as the preferred alternative (i.e., MNA and land use controls [LUCs]).	Agree. The second bullet has been revised to indicate Alternative 2 is the preferred alternative, as shown below: • "Alternative 1: No action • Alternative 2: MNA and LUCs (DOE's preferred alternative) • Alternative 3: Pump and Treat MNA and LUCs"
18.	Table 2, Summary of remedial action alternatives, Page 14:	The costs presented for Alternatives 2 and 3 do not provide breakout costs for annual operations and maintenance (O&M) requirements per Section 3.3.7 (Summary of Remedial Alternatives) of the EPA Decision Guidance. Please revise the table to provide the costs for annual O&M requirements for Alternatives 2 and 3 to support a comparative evaluation of primary balancing criteria for costs.	Agree. Annual O&M costs (present worth) have been added to Table 2 (which is attached to this table).
19.	Section 10, Community Participation, Page 20:	This section does not include all of the elements per Section 3.3.10 (Community Participation) of the EPA Decision Guidance. For example, the dates of the comment period, the location of the public meeting, names/phone numbers/addresses (including email address) of the contact person who will receive comments or provide additional information, as well as any citizen advisory boards (CABs) participation. As this is a key milestone for Community Participation, this information should be clearly presented. Please revise the text to include this information.	 Clarification. The requested information has been added to Section 10. The revised section is presented below, with new text highlighted: "10. COMMUNITY PARTICIPATION DOE, EPA, and TDEC encourage the public to review this document and other relevant documents in the Administrative Record to gain an understanding of the ETTP K-31/K-33 Area and the proposed groundwater cleanup action. A copy of this Proposed Plan, as well as the entire Administrative Record, is located at the DOE Information Center, at the Office of Scientific and Technical Information, 1 Science.gov Way, Oak Ridge, Tennessee, 37830. The center is open Monday through Friday, 8 a.m. to 5 p.m.; the telephone number is (865) 241-4780. DOE will establish a 45-day public comment period and schedule a public meeting to discuss the preferred alternative and address any questions or concerns from the public. The public meeting will be held at the DOE Information Center



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			(see the previous paragraph for the address). The public comment period will begin upon regulatory approval of the Proposed Plan, and the dates will be specified in DOE's public notice announcing the availability of the Proposed Plan and the dates for the public comment period. The announcement will include details regarding the public meeting.
			DOE also encourages the public to submit comments on the proposed remedial action. Comments may be provided at the public meeting or via email to <u>OakRidgeEM@orem.doe.gov</u> . Written comments may be addressed to the FFA Project Manager, Oak Ridge Environmental Management, DOE Oak Ridge Operations, Post Office Box 2001, Oak Ridge, Tennessee, 37831. Extensions to the comment period will be granted if requested via email to <u>OakRidgeEM@orem.doe.gov</u> or via written correspondence to the physical address provided above. DOE will document and respond to comments as part of the



REFERENCES PROVIDED BY EPA

References

DOE 2022. Remedial Investigation/Feasibility Study Report for the K-31/K-33 Area at the East Tennessee Technology Park, Oak Ridge, Tennessee (DOE/OR/01-2893&D2) (RI/FS).

EPA 1991. Risk Assessment Guidance for Superfund: Volume 1 – Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals). EPA/540/R-92/003

EPA 1999. A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents. OSWER Directive 9200.1-23P. July 1999.

EPA 1999. Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tanks. OSWER Directive 9200.4-17P. April 1999

EPA 2014. Determining Groundwater Exposure Point Concentrations, Supplemental Guidance. OSWER Directive 9283.1-42. February 2014

EPA 2022. ProUCL Version 5.2.0 Technical and User Guides. Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations. June 2022





Figure 1. Location of the ORR and ETTP.





Figure 4. Monitoring wells with MCL exceedances based on June 2021 sampling.



Table 2. Summary of remedial action alternatives

Decemption	Cost (\$)/ fillenanie (years)
The no-action alternative was included to provide a baseline for comparison to other alternatives, as required by the National Oil and Hazardous Substances Pollution Contingency Plan. Under this	Cost: \$0 Timeframe: Not applicable
occur. Future contamination trends will not be evaluated or reported.	Capital cost: \$131.000
attenuate (reduce) the concentration, toxicity, or mobility of contaminants. These processes are closely monitored and evaluated over time to determine	Total present-worth cost: \$1.8 million
progress toward RAOs. LUCs will be implemented to prohibit the use of groundwater and provide notifications to future landowners concerning the	Annual O&M present-worth cost: \$84,000
presence of contaminated groundwater. The LUCs remain in place until RAOs are achieved. The estimated costs include installing and monitoring additional wells; however, the need for, number, and exact locations of additional wells will be addressed during development of the Remedial Action Work Plan.	Timeframe: 15 years
Alternative 3 extracts and treats groundwater with the highest concentrations of chromium and nickel,	Capital cost: \$2,355,000
targeting specific areas with more persistent exceedances of MCLs (Figure 6). MNA will be	Total present-worth cost: \$11.2 million
implemented in areas where monitoring well data have shown lower contaminant concentrations (and only intermittent MCL exceedances). Groundwater will be pumped out of specially constructed extraction wells. A	Annual O&M present-worth cost: \$882,000
dedicated water treatment plant will be constructed near the extraction wells to treat the extracted groundwater. The treatment process will consist of a bag filter (to remove suspended solids), followed by ion-exchange units that will use two different ion-	Timeframe: 10 years
exchange resins to remove the chromium and nickel. Treated water will be discharged to the Clinch River in accordance with the Clean Water Act and TDEC regulations. MNA and LUCs will be implemented as described with Alternative 2	
	The no-action alternative was included to provide a baseline for comparison to other alternatives, as required by the National Oil and Hazardous Substances Pollution Contingency Plan. Under this alternative, no remediation, monitoring, or LUCs will occur. Future contamination trends will not be evaluated or reported. Alternative 2 relies on naturally occurring processes to attenuate (reduce) the concentration, toxicity, or mobility of contaminants. These processes are closely monitored and evaluated over time to determine progress toward RAOs. LUCs will be implemented to prohibit the use of groundwater and provide notifications to future landowners concerning the presence of contaminated groundwater. The LUCs remain in place until RAOs are achieved. The estimated costs include installing and monitoring additional wells; however, the need for, number, and exact locations of additional wells will be addressed during development of the Remedial Action Work Plan. Alternative 3 extracts and treats groundwater with the highest concentrations of chromium and nickel, targeting specific areas with more persistent exceedances of MCLs (Figure 6). MNA will be implemented in areas where monitoring (and only intermittent MCL exceedances). Groundwater will be pumped out of specially constructed extraction wells. A dedicated water treatment plant will be constructed near the extraction wells to treat the extracted groundwater. The treatment process will consist of a bag filter (to remove suspended solids), followed by ion-exchange units that will use two different ion-exchange resins to remove the chromium and nickel. Treated water will be discharged to the Clinch River in accordance with the Clean Water Act and TDEC regulations. MNA and LUCs will be implemented as described with Alternative 2.

Note: Costs represent direct project costs only and do not include all program-level management and overhead burdens.

LUC = land use control

MCL = maximum contaminant level

MNA = monitored natural attenuation

O&M = operations and maintenance

RAO = remedial action objective

TDEC = Tennessee Department of Environment and Conservation



Document Number:	Document Title:		
DOE/OR/01-2922&D1	Proposed Plan for the Record of Decision for Groundwater in the K-31/K-33 Area at the East Tennessee Technology Park, Oak Ridge,		
	Tennessee		
Name of Reviewer:	Organization:	Date Comments Transmitted:	
Randy C. Young	Tennessee Department of Environment and Conservation 11/08/22		

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1	Section 3, Summary of Site Risks, fifth paragraph, page 9	Please identify in this text that the <i>Final Sitewide Remedial</i> <i>Investigation and Feasibility Study for Residual Contamination at</i> <i>East Tennessee Technology Park (DOE/OR/01-2279&D3)</i> was never approved. As currently written, it could be perceived by the public that this document is an approved document in this record. This is potentially confusing to the general reader.	Agree with clarification. The fifth paragraph in Section 3 has been deleted in response to EPA comments.
2	Section 3, Summary of Site Risks, fifth paragraph, page 9	 All constituents exceeding regulatory limits or human health risk levels in groundwater should be addressed by the proposed remedy though out this document. As was addressed in comment response #1 from DOE to TDEC in TDEC's DOE/OR/01-2893&D1/R1 comments to be incorporated in to the D2 FFS document, DOE has stated previously: "<i>No COCs have been excluded from the FS based on the HHRA, frequency of MCL exceedances, or magnitude of the concentrations.</i>" Please evaluate and reword the text in paragraph 5 under section 3 that uses the unapproved "Final Sitewide Remedial Investigation and Feasibility Study for Residual Contamination at ETTP, Oak Ridge, TN Volumes 1 through 3 (DOE/OR/01-2279&D3)" to state that "metals were not analytes of interest in groundwater in the K31/33 Area due to their limited frequency of detection above screening levels." 	Agree with clarification. The fifth paragraph in Section 3 has been deleted in response to EPA comments.
3	Section 3, Summary of Site Risks, sixth paragraph, page 9	A baseline human health risk assessment does not differentiate between what COCs should be retained and what COCs should be excluded during site cleanup. The decision to retain COCs should be evaluated using process knowledge to identify which COCs are site related and which COCs are not believed to be attributed to site activities. Please revise this paragraph to state the reasoning for only retaining chromium and nickel as COCs and remove the statement that reads;" the baseline human health risk assessment concluded chromium and nickel are considered to be the primary COCs for groundwater in the K-31/K-33 Area".	Agree. The sixth (now fifth) paragraph has been revised, and hexavalent chromium has been included as a primary COC in response to EPA specific comment 6: "In addition to the risk assessment results, groundwater data (including data from dedicated, low-flow sampling pumps starting in 2019) and evaluation of process knowledge from the K-31/K-33 Area indicate chromium and nickel have been the most commonly occurring constituents, with concentrations exceeding MCLs. As a result, chromium (including both total chromium and hexavalent chromium)



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			and nickel are considered to be the primary COCs for groundwater in the K-31/K-33 Area."
4	Section 3, Summary of Site Risks, last paragraph, page 9	Please remove the portion of the statement that an ecological risk assessment was not conducted because the site is an industrial area. Land use does not prescribe whether an ecological risk assessment needs to be completed. Please provide clarification in the comment response regarding when eco risk will be addressed at this site within the administrative record.	Agree. The statement has been revised as suggested in the comment and in response to EPA specific comment 12: "Ecological risk associated with groundwater contamination was not quantitatively evaluated for the K-31/K-33 Area RI/FS. There are no ponds, springs, or perennial streams in the formerly industrialized, upland portion of the area that might receive discharging groundwater and provide habitat for ecological receptors. A spring and seep survey along the banks of Poplar Creek, completed by the U.S. Geological Survey in 1995, identified several minor seeps in the southern and southeastern portions of the K-31/K-33 Area. These seeps were primarily wet-weather conveyances with low, intermittent flow rates and are also unlikely to provide appreciable habitat value. Based on these conditions, groundwater is not associated with a complete exposure pathway for ecological receptors in the K-31/K-33 Area." DOE agrees land use does not determine whether an ecological risk assessment is required. Land use does, however, have an important impact on the extent of natural habitat available for terrestrial ecological receptors. The planned future land use for Zone 2 is a privately owned industrial property that provides de minimis natural habitat for terrestrial ecological receptors. Zone 2 was, and will remain, industrial property, with future development comprised of buildings, roads, parking lots, and maintained landscaping (e.g., mowed lawns). Given the future land uses in Zone 2, only relatively small, fragmented patches of unmaintained landscape will remain. As such, these areas are qualitatively assessed to include no significant, completed exposure pathways from soil to terrestrial habitats, and the soils do not require further, quantitative evaluation for the protection of ecological receptors.



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			DOE's position on Zone 2 ecological risk was presented in the <i>Remedial Investigation Work Plan for Remaining</i> <i>Ecology/Surface Water/Sediment at the East Tennessee</i> <i>Technology Park, Oak Ridge, Tennessee</i> (DOE/OR/01- 2912&D2), which was approved by TDEC and EPA in October 2022.
5	Section 4, Remedial Action Objectives, page 9, first bullet	Revise the first RAO bullet to state: "Return usable ground waters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site".	Clarification. The first RAO bullet has been revised in response to EPA specific comment 15, contained in the 02/07/2023 email to DOE, as shown below: "Restore groundwater to drinking water standards (federal and state)"
6	Section 4, Remedial Action Objectives, page 9	Please include an RAO bullet that states "Groundwater contamination should not be allowed to migrate and further contaminate the aquifer or other media (e.g. vapor intrusion into buildings, sediment, surface water, or wetland)."	Clarification. The existing RAOs address migration control through the objectives of restoring groundwater to its beneficial use while preventing exposures to the groundwater (including the vapor intrusion pathway) and protecting surface water quality.
7	Section 4, Remedial Action Objectives, page 9, bullets 2, 4, and 5	RAO bullets 2, 4, and 5 address preventing exposures. As LUCs are interim measures while groundwater remedy is being implemented, please include "until groundwater is returned to beneficial use" to the end of those bullet statements. This intent is referenced in text section 7.1.2 Land Use Controls, but please include this language into these bulleted RAOs specifically as well.	Clarification. In response to comments from EPA, bullets 2, 4, and 5 have been combined into a single RAO, as shown below: "Prevent exposure of humans, including industrial and construction workers, via dermal contact, ingestion, and/or inhalation to groundwater containing COCs above protective levels and prevent on-site consumption of groundwater above MCLs or applicable state groundwater criteria that are applicable or relevant and appropriate requirements (ARARs)."
8	Section 4, Remedial Action Objectives, first paragraph, page 9	 Please remove the sentences that discuss the near-term and future end uses in the K-31/K-33 area in this section: <i>"The anticipated near-term and future end uses in the K-31/K-33 Area are industrial, which is consistent with the Covenant Deferral Request transferring the land to the Community Reuse Organization of East Tennessee. Currently, the K-31 area is being leased as a support facility to the Y-12 Uranium Processing Facility construction project, and the K-33 footprint has been sold</i> 	Agree. The italicized text included in the comment has been removed from Section 4 and added to the end of Section 2.1.2.



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		 to Kairos Power who plans to use it for a nuclear energy demonstration reactor. Future industrial use of the groundwater at ETTP is improbable and would require prior approval from DOE, EPA, and TDEC before implementation. Groundwater would be of limited industrial use due to the complex geology, the availability of the Clinch River immediately adjacent as a water source, and the availability of the existing municipal water supply. Future residential use of the K-31/K-33 Area is prohibited through LUCs established under the Zone 2 ROD." The end use for the K-31/K-33 area is irrelevant when establishing RAOs for groundwater. All groundwater" 0400-40-0307. This information might be better placed in Section 2.1.2 Site History and Status 	
9	Section 4, Remedial Action Objectives, second paragraph, page 9	Please remove the term "industrial use" from the first sentence of this paragraph. Comment 8 above recommends removing or relocating these paragraphs. Please note, regardless of where the paragraphs are relocated, the term "industrial use groundwater" is not a relevant classification under TDEC Rule 0400-40-03 General Water Quality Criteria, and that "industrial use groundwater" terminology should be reworded or removed in all instances where groundwater usage and the required water quality criteria associated with those uses, are being discussed.	Agree. The paragraph has been moved to Section 2.1.2, and the first two sentences have been revised as follows: "Future use of the groundwater in the K-31/K-33 Area is improbable and would require prior approval from DOE, EPA, and TDEC before implementation. Groundwater would be of limited use to future site developers due to the complex geology, the availability of the nearby Clinch River as a water source, and the availability of the existing municipal water supply. Future residential use of the K-31/K-33 Area is prohibited through land use controls (LUCs) established under the Zone 2 ROD."
10	Section 6.2, Compliance with Applicable or Relevant and Appropriate Requirement, First paragraph, page 15	Please revise the sentence to state that Alternative 1 would not achieve the chemical specific ARARs which would include ALL enforceable numerical standards, both EPA MCLs and TN general use water quality criteria.	Agree. The sentence has been revised as follows: "Alternative 1 would not achieve the chemical-specific ARARs, which include all enforceable numerical standards."
11	Section 6.7, Cost, last sentence, page 17	Please change "Remedial Design Report" to "Remedial Design Work Plan".	Clarification. See response to comment 12.



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		Please include after paragraph 2 in this section, a discussion regarding the evaluation of the monitoring network and the potential need for installing additional monitoring wells as part of the Remedial Design Work Plan (RDWP) and Remedial Design Report (RDR) stage of the CERCLA process.	Clarification. As stated in Section 7.1.1, the "Monitoring program design will commence with a tri-party data quality objectives effort" DOE plans for this DQO effort to include an evaluation of the potential need for installing additional monitoring wells. The second sentence in the third paragraph has been revised to add the consideration for additional wells:
12	Section 7.1.1, page 18		"Monitoring program design will commence with a tri-party data quality objectives effort that will focus on monitoring locations, the need for installing additional monitoring wells, the frequency of sampling, and the specific constituents to be monitored."
			Results from the DQO process, including the decision regarding additional wells, will be documented in the Remedial Design Report (RDR). The RDR will present the rationale for selecting the actual wells to be monitored and will include installation details for any additional wells needed. TDEC and EPA will provide input to the RDR through the FFA review and approval protocol.
		The first sentence of this paragraph reads: "Hazardous substances above health-based levels will remain onsite if this remedy is implemented." Please define hazardous substances in the context of this statement and elaborate what hazardous substances are intended to be left in groundwater with implementation of this remedy, and for what time frame are they intended to remain?	Clarification. The original language is based on the Annotated Outline for Proposed Plans in the FFA. The paragraph has been revised as follows:
13	Section 8, Natural Resource Damages, page 19	remedy, and for what time frame are mey intended to remain.	"The proposed remedy for K-31/K-33 Area groundwater is intended to remove contamination from the groundwater and allow its eventual beneficial use. DOE has no plans to leave hazardous substances above health-based levels in groundwater. Conversely, the CERCLA-driven soil cleanup of the K-31/K-33 Area under the Zone 2 ROD was based on a future industrial reuse of the area and was not intended to allow for unrestricted use/unlimited exposures.
			Because potentially hazardous substances will remain in K-31/K-33 Area soils, it is recognized by DOE, TDEC, and EPA that Natural Resource Damage claims, in accordance with CERCLA, may be applicable. This document does not



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			address restoration or rehabilitation of any natural resource injuries that may have occurred, or whether any such injuries have occurred. Neither DOE nor TDEC waives any rights or defenses they may have under CERCLA Section 107(1)4(c)."



Department of Energy

Oak Ridge Office of Environmental Management P.O. Box 2001 Oak Ridge, Tennessee 37831

May 24, 2023

Mr. Leon Shields Chair Oak Ridge Site Specific Advisory Board Post Office Box 2001 Oak Ridge, Tennessee 37831

Dear Mr. Shields:

RESPONSE TO LETTER ENTITLED, RECOMMENDATION 253: ON THE FY 2025 OREM PROGRAM BUDGET PRIORITIES

Reference: Letter from Leon Shields to Jay Mullis, *Recommendation 253: On the FY 2025* OREM Program Budget Priorities, dated May 15, 2023

I would like to express my appreciation for the interest the Board has taken in the Fiscal Year 2025 budget formulation effort. Thank you for your recommendation. We will submit your recommendation to the Environmental Management Federal Advisory Committee Act Designated Federal Officer.

If you have any questions or if we can be of further assistance, please contact Melyssa Noe at 241-3315 or me at 576-0742.

Sincerely,

Laura O. Wilkerson Digitally signed by Laura O. Wilkerson Date: 2023.05.24 10:04:17 -04'00'

^{for} John A. Mullis II Manager

cc:

Terry Frank, Anderson County Mayor Samantha Urquhart-Foster, EPA Region 4 Mark Watson, Oak Ridge City Manager Wade Creswell, Roane County Executive Kristof Czartoryski, TDEC, Oak Ridge Kelly Snyder, EM-3.2 <u>emccmailbox @em.doe.gov</u> Abby Newberry, EM-942 Melyssa Noe, EM-942 Roger Petrie, EM-942 Erin Sutton, EM-94 Laura Wilkerson, EM-90

OFFICER ELECTIONS

It is time to consider the election of officers to the Chair, Vice Chair and Secretary positions on the board. We ask that you submit your interest to staff by July 31 so a potential slate of candidates can be announced at our annual planning meeting in August. That will give

The vote will then take place as the first point of board business at the November meeting, which will be the first of our FY 2024 sessions. Nominations can be made from the floor at that time, but it is helpful to have a slate to start from.

If you are not sure on these roles, but would like to get your feet wet, so to speak, elections are also held for the Chair/Vice Chair of the EM & Stewardship Committee, which will be voted on at the November meeting of that body.

Please consider these leadership roles as part of your service to the board. Likewise, if there are members you believe would do well in a leadership role, encourage them to throw their name in!

If you are interested – whether you are a current member or officer - please email me at your earliest convenience. I would appreciate responses by Monday, July 31. If you don't want to be an officer but would like to nominate someone else, I can address that as well.

As a reminder:

These Elected officers:

- meet approximately once a month (generally the first Wednesday of the month) to discuss board business such as recommendations, following up on action items, and draft/approve meeting agendas,
- lead the monthly meetings, and
- represent the board at occasional meetings such as the EM SSAB Chairs Meeting twice a year to conference with other boards. Likewise, they are given priority for some travel/training opportunities.
- It is preferred that the Chair have previous experience on the executive committee as vice chair, secretary, or EM Stewardship chair/vice chair.

Status of Officer Positions

Chair – Leon Shields is ineligible to serve as he has met the six-year term limit for membership on the board

Vice Chair – Amy Jones may serve again in any officer position

Secretary – Michelle Lohmann is ineligible to serve as she has met the six-year term limit for membership on the board