Network of National Laboratories for

NNLEMS

Environmental Management and Stewardship

Development of Science Based Solutions to Address DOE-EM's Challenging Soil and Groundwater Problems

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Acronyms and Abbreviations

ALTEMIS	Advanced Long Term Environmental Monitoring Systems
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRESP	Consortium for Risk Evaluation with Stakeholder Participation
DOE-EM	Department of Energy – Environmental Management
DOE-LM	Department of Energy – Legacy Management
ETEC	Energy Technology Engineering Center
GAO	Government Accountability Office
DOE HQ	Department of Energy Headquarters
LANL	Los Alamos National Laboratory
MNA	Monitored Natural Attenuation
NNNLEMS	Network of National Laboratories for Environmental Management and Stewardship
RCRA	Resource Conservation and Recovery Act
SRNL	Savannah River National Laboratory
SRS	Savannah River Site
TD	Technology Development
TDO	Technology Development Office
TI	Technical Impracticability
TRAC	Tracking Restoration and Closure
WVDP	West Valley Demonstration Project

Introduction

Remediation of contaminated soil and groundwater has been ongoing at Department of Energy (DOE) sites for over four decades, yet closure at the complex groundwater plumes has been elusive especially when complicated by challenging geologic, hydrologic, and chemical factors. The purpose of this activity is to identify science-based strategies focused on site closure that can be used to develop a consistent complex-wide groundwater management strategy for DOE Office of Environmental Management (DOE-EM) to address the remaining complex groundwater plumes. The recommendations will be used to develop metrics to track and expedite cleanup progress in order to shrink the remaining cleanup footprint significantly over the next decade. Both technical and regulatory strategies will be necessary to remediate the groundwater plumes for eventual transfer to the DOE Office of Legacy Management (DOE-LM) or other entities. This report also identifies key soil- and groundwater-related technical needs for the remaining EM sites to achieve site closure.

Approach

A three-phased approach was initiated to develop a focused framework to assist decision makers with metrics to expedite groundwater remediation of various complex plumes toward site closure at the DOE EM sites. The first activity was focused on identification of key technical needs to support closure. This was followed by interviews with each of the sites to identify key technical, regulatory and stakeholder challenges inhibiting closure. The third phase is focused on development of a complete end state vision for each of the sites, followed by development of complex wide metrics focused on expediting site closure.

Phase 1: Update Technical Targets and Match to Recent Site Needs Survey

A technical target identifies a critically important research and development topic. In the document, targets are identified and described and background information on relevance and the state of the art and practice is provided. This is followed by a short description of vital scientific and technical objectives. The objectives are the heart of the target because they identify and describe a few key development themes. The themes clearly document some of the most significant technical issues faced by end users. Examples of the overarching technical focus include high level goals such as development of exit strategies for pump-and-treat systems, identification of key technical uncertainties slowing remedial progress, and improved long-term monitoring strategies for residual contaminants.

To update the technical targets, Savannah River National Laboratory (SRNL) hosted a series of virtual Network of National Laboratories for Environmental Management and Stewardship (NNLEMS) seminars during the July/August 2021 timeframe. The team consisted of 24 technical experts from NNLEMS. Participants included representatives, including early- to mid-career scientists, from eight national labs (Appendix A). These seminars were structured to first review and update the existing technical targets document that was developed in 2002. After decades of remedial activities, the current technical focus has evolved with the need to address issues such as lower levels of contaminants remaining after decades of cleanup so that active remediation is no longer cost effective, and remediation of residual sources that are challenging to characterize, access and treat. Two additional high priority targets were identified: Improving the Technical Basis for Environment Stewardship Management and Methods to Verify and Validate Performance. These two targets focus on the need for improved long-term monitoring of residual contamination and improved communication strategies for stakeholders and regulators. The team reviewed the current needs assessment in context of the updated technical targets and made specific recommendations for technical areas that should be considered for DOE HQ program planning and targeted technology development funding. Figure 2-1A identifies the updated list of technical targets and Figure 2-1B shows the overlay of targets spatially on a groundwater plume. The updated report provides revised Technical Targets listed below in Figure 2-1 with specific recommendations for specific sites (SRNL-STI-2021-00502).

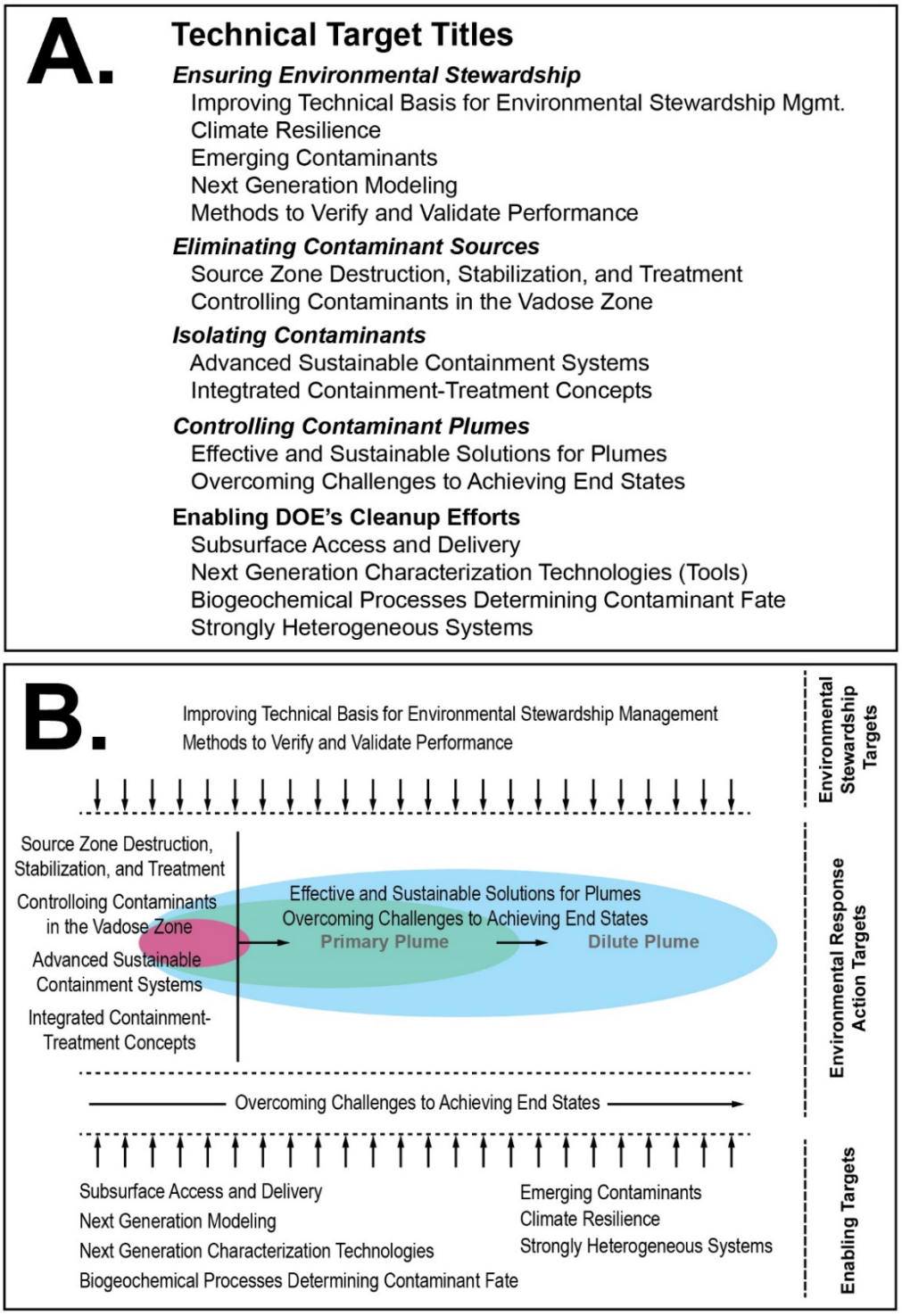

Figure 2-1. Technical Targets and Their Relationships. A) Sorted by strategic investment category, and B) a graphical representation overlaying targets onto environmental restoration activities.

Phase 2: Site Interviews

Phase 2 was initiated following completion of the technical targets document. Because the focus of the interviews now expanded from technical issues to include regulatory and stakeholder challenges, team members were added to include legal and regulatory experts (specifically, Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Technical Impracticability (TI) Waivers) to evaluate existing site agreements and determine whether flexibility or enhanced focus opportunities might be possible to expedite closure. This team also included five NNLEMS representatives from the Phase 1 technical targets team (Appendix A).

Site interviews were initiated with a conference call with EM site liaisons to communicate the details of the proposed activity. The liaisons were asked to contact the sites and request that the sites identify 3-5 high priority challenges focused on impediments to closure, specifically, technical, regulatory and stakeholder issues for the team to address as part of the reviews. A matrix was developed for the site to better structure the interview process including development of a short list of challenges and selected background information (Appendix B). From May to August 2022, the following EM sites were interviewed: Energy Technology Engineering Center (ETEC), Hanford, Los Alamos National Laboratory (LANL), Moab, Oak Ridge, Paducah, Portsmouth, Savannah River Site (SRS), and West Valley Demonstration Project.

The team conducted the site interviews and prepared a writeup on each of the sites. The writeups include the template completed by the site, a summary of the team discussions, as well as specific recommendations made by the review team. The draft writeups were provided to the sites for review and comment. The final document provides a summary of the findings with an appendix that includes the templates from each of the EM sites. In addition, it documents needs at individual operable units but is focused on the large complex groundwater plumes present at Paducah, Savannah River, Hanford, Los Alamos, Oak Ridge, and Moab. The integrated document was provided to the DOE Director of the Subsurface Closure Office. A summary of the site identified technical needs for achieving end state is provided in the Technical Needs Section below.

Phase 3: Development of an Expedited Site Closure Strategy for Soil and Groundwater Document

The goal of the third phase of the site closure activity (conducted in FY23) is focused on the development of an integrated, complex wide strategy to support groundwater closure. A key element of this activity is to provide metrics for EM HQ that can be used to expedite the cleanup of the remaining contaminant plumes in a consistent manner. As part of the effort, the team proposed metrics to better track cleanup progress. Early in the discussions, the team identified the need for each site to develop and document a clear End State Vision for each of the complex groundwater plumes which will include all necessary components for closure. To support this goal, the team developed an ‘End State Vision Implementation Strategy’ template which identifies the specific components of the comprehensive End State vision (Appendix C). The sites will complete the template in order identify the closure components that may require additional attention. The NNLEMS team will provide technical support as the site

develops their End State Vision. The End State Implementation strategies from each of the sites will then be used to develop the tracking metrics.

Since site closure is challenging and requires continuous focus on key elements, a metrics dashboard should clearly identify status and stages to reach the desired end state. For groundwater, the key metrics are a clear end state vision and strategy for achievement, moving forward from characterization to remediation stages (preferably passive remediation) that support the end state, controlling exposure risk at all points along the spectrum, and aligning engagement with decision makers and stakeholders to support desired timelines. Continued refinement and development of groundwater monitoring and remediation technologies will also assist in end state achievement.

The team drafted potential dashboard metrics that may be modified as the team works with the sites to develop their end state visions. Initially, the team proposed the following four metrics to preserve focus since too many metrics tend to diffuse priority. These metrics are designed to align with transition points to other DOE offices, such as Legacy Management. The four proposed Dashboard metrics are:

- Groundwater Plume Status,
- End State,
- Control of Exposure, and
- Engagement.

Below is a description of each proposed metric.

1. **Groundwater Plume Status**: This metric measures the extent of groundwater plume control and regulatory approval of final groundwater remedies. The ultimate success in this metric is that the plume is stable or shrinking, human exposure is not occurring, regulatory acceptance has been obtained for final remedies, and remedies have shifted from active to passive. Most sites have groundwater plumes that are in the characterization stage and/or interim measure stage. Very few have a regulatorily approved final groundwater remedy in place that is active; even fewer still have a final approved passive groundwater remedy. The DOE goal would be to remediate groundwater to support the End State, ultimately using passive activities such as monitored natural attenuation, that are approved in appropriate regulatory documents to reduce long-term costs and management responsibilities.

2. **End State**: This metric measures whether an End State has been defined, including institutional and engineering controls. The ultimate success in this metric is that the End State has been defined, along with implemented institutional and engineering controls, and the End State has been appropriately incorporated into approved regulatory documents (for example, Orders, Agreements, Permits, Records of Decision, Groundwater Corrective Action Plans). Most sites have End State goals defined; some sites have a few areas that have reached final remediation with institutional and engineering controls identified in approved regulatory documents. Very few areas at sites would currently attain the standard identified in Section I of the Legacy

Management Site Transition Framework for Long-Term Surveillance and Maintenance (DOE-LM, n.d.)

3. **Control of Exposure**: This metric reflects whether any uncontrolled or unacceptable human exposure is occurring from DOE sourced contamination either onsite or offsite. For most DOE sites, Exposure Risk should be controlled so that it is within acceptable risk ranges. However, this metric is a high-level way to track if there is any change in migration and exposure that requires action. This measure is also a good public facing communications tool.

4. **Engagement**: This metric reflects the degree of regulatory, stakeholder, and Tribal Nation (if applicable) engagement. The progress stages reflect the effectiveness of needed frequent and regular discussions between DOE and regulators, stakeholder, Tribal Nations. Currently the status at most DOE EM sites is the existence of regular communication between DOE and other decision makers/stakeholders. The more progressive stages are whether this communication framework is sustainable, achieves decision points that support mission need schedules, and whether the communication framework extends up and down the management structures of regulator/Tribal Nation interfaces and all key stakeholder groups.

An initial version of the tracking levels for the metrics has been developed for early consideration (Tables 2-1 to 2-4). The metrics may be modified after interactions with the sites during the development of their end state visions plans.

Table 2-1. Groundwater Plume Control Rankings and Descriptions

Ranking	Description
Low	Plume migration is not controlled (increasing in size or possibly impacting receptors)
Medium-Low	Plume migration is not controlled, but remediation plans for plume control are being developed
Medium	Plume is partially controlled and contained on Site property
Medium-High	Plume is partially controlled, and final remedy is proposed but waiting on regulatory approval
High	Plume is controlled (stable, not increasing in size or decreasing) via passive remediation

Table 2-2. End State Rankings and Descriptions

Ranking	Description
Low	Undefined
Medium-Low	Process started to reach consensus on target end state
Medium	Target end state (residential, industrial, recreational, long term doe stewardship) has been internally developed
Medium-High	Target end state is used in regulatory documents awaiting regulatory approval
High	End state (residential, industrial, recreational, long-term doe stewardship) meets requirements in section I of Legacy Management Site Transition framework (REF).

Table 2-3. Control of Exposure Rankings and Descriptions

Ranking	Description
Low	Potential human exposures exist that are not controlled
Medium-Low	Plans developed to control human exposure risk, but resources needed
Medium	Some potential human exposures are controlled but some remain
Medium-High	Plans developed to control any remaining potential human exposure risk but awaiting regulatory approval
High	All potential human exposure risk is controlled

Table 2-4. Engagement Rankings and Descriptions

Ranking	Description
Low	Stakeholder: None
	Regulatory: None
	Tribal Nation: None
Medium-Low	Stakeholder: Started, but additional resources needed
	Regulatory: Started, but additional resources needed
	Tribal Nation: Started, but additional resources needed
Medium	Stakeholder: Intermittent
	Regulatory: Regular technical level discussions
	Tribal Nation: Regular technical level discussions
Medium-High	Stakeholder: Provides support for needed regulatory/NEPA actions to meet mission schedule
	Regulatory: Provides support for needed regulatory/NEPA actions to meet mission schedule
	Tribal Nation: Provides support for needed regulatory/NEPA actions to meet mission schedule
High	Stakeholder: Regular, consistent, sustainable framework for all stakeholder groups
	Regulatory: Established framework of regular, sustainable discussions at technical, management and leadership levels
	Tribal Nation: Tribal Nation accepted framework of regular discussions at technical and leadership levels or NA

Technical Needs

The team also evaluated the technical needs for achieving site closure as identified in site interviews in context of the soil and groundwater technical targets. The technical team ranked and prioritized technical assistance and projects for recommendations for funding by the Technology Development office. Approximately 110 technical needs were identified during the site interviews. The technical team prioritized seven needs as high priority shown in the Table 3-1. In summary, the technical needs that funding would impact the greatest number of sites are 1) semi-passive remedies/advanced monitored natural attenuation (MNA) tools, 2) remedies for back diffusion/low permeability zones, and 3) alternative modeling approaches for realistic timeframe/optimization.

Table 3-1. Prioritized Technical Needs Summary

Technical Need	Site(s) Impacted	Type of Assistance
Dose factor for iodine and potentially technetium	Hanford, Savannah River Site	Technical assistance
Acceleration of mass removal, control, and/or reduction in source areas	Paducah	Technical assistance
Semi-passive remedial approaches and advanced tools for MNA	ETEC, Hanford, Los Alamos, Moab, Oak Ridge, Paducah, Portsmouth, Savannah River Site, West Valley	Technical assistance, technology demonstration

Remedies for back diffusion/low-permeability zones	ETEC, Oak Ridge, Paducah, Portsmouth, Savannah River Site	TD project
Deep vadose zone contamination characterization/monitoring	Hanford, Los Alamos	Technical assistance, then technical demonstration
Alternate modeling approaches	ETEC, Hanford, Los Alamos, Moab Paducah	Technical assistance, then TD project
Stochastic modeling approaches	Hanford, Los Alamos, Moab	Technical assistance, then technology demonstration

It is also important to understand the top needs at each site. Table 3-2 outlines the top needs determined by the site interviews at each site.

Table 3-2 Top Identified Need for Each Site Interviewed in Phase 2

Site	Top Identified Need
ETEC	Remedies for back diffusion/low permeability
Hanford	Dose factor for iodine and potentially technetium
Los Alamos	Deep vadose zone characterization/monitoring
Moab	Semi-passive remedial approaches and advances tools for MNA
Oak Ridge	Remedies for back diffusion/low permeability
Paducah	Acceleration of mass removal, control, and/or reduction in source areas
Portsmouth	Remedies for back diffusion/low permeability
Savannah River Site	Semi-passive remedial approaches and advances tools for MNA
West Valley Demonstration Project	Semi-passive remedial approaches and advances tools for MNA

This approach will allow for implementation to other applicable sites. This will result in a reduction in extent of footprint requiring cleanup, timeframe and cost reduction, and the facilitation of exit strategies and achieving end states. This will also take into consideration partnership and regulatory and stakeholder communication best practices.

Conclusions

The closure path for each EM site should include identification of interim and final goals that will facilitate acceptance by stakeholders and regulators and contingency closure paths to provide EM decisionmakers with robust options for management of the cleanup portfolio.

The integrated strategy will identify key areas where investments in technology development are required to facilitate closure, to maximize the return on investment and minimize redundant and overlapping funding, to identify potential test beds where technologies can be demonstrated and evaluated at well-characterized sites, and to identify insertion points for high priority targeted technology investment.

In addition, the team will make strategic suggestions for negotiation of regulatory requirements for closure. As an example, the DOE-HQ TD program is currently funding the ALTEMIS (Advanced Long-Term Environmental Monitoring Systems) program at F-Area at Savannah River Site (SRS) to look at improved strategies for monitoring radiological contamination. The ALTEMIS project is investigating the use of sensors and spatial monitoring to replace many of the currently required wells, providing more robust monitoring while simultaneously reducing costs by an estimated 80%. Working with the state regulators to demonstrate the efficacy of the program will facilitate implementation of the strategy which should be allowed under the current RCRA permit. The recommendations will also leverage the recent DOE NNLEMS activity on climate resiliency to enhance the longevity of remedial solutions.

In many situations, obtaining support of stakeholders, local communities and indigenous groups, for the technically complex strategies proposed by DOE requires strong and ongoing facilitation and communication in a systematic manner. For example, under CERCLA, site closure requires the interplay of multiple factors to arrive at a final remedy. No single factor determines the ultimate outcome, and each site's solution is uniquely crafted, considering existing regulations, the nature of the impacted environment, the scope and extent of contamination, the potential available solutions, and the views of the impacted community.

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Looney, B.B and Nyman, J. 2021. Technical Targets 2021 – A Tool to Support Strategic Planning in the United States Department of Energy (DOE). SRNL-STI-2021-00502. Aiken, SC.

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Appendices

Appendix A: Team Members

Table A-1. Technical Targets (Phase 1) Team Members

Affiliation	Team Members
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Pacific Northwest National Laboratory	Chris Johnson Judy Robinson Catherine Yonkofski
Sandia National Laboratories	Carlos Jove-Colon Mark Rigali Yifeng Wang
SLAC National Accelerator Laboratory	Vincent Nöel
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Geosyntec Consultants, Inc.	Jennifer Nyman
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Table A-2. Site Interviews (Phase 2) Team Members

Affiliation	Team Members
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Pacific Northwest National Laboratory	Jim Szecsody Christian Johnson
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Table A-3. End State Vision (Phase 3) Team Members

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Pacific Northwest National Laboratory	Christian Johnson
Geosyntec Consultants, Inc.	Jennifer Nyman
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CRESP	Kathy Higley
DOE-EM HQ	Grover (Skip) Chamberlain

Appendix B: Site Interview Questionnaire: Challenges to Closure

Current Status	
Existing Technology Describe the contamination and the existing technology used to address the contamination. How long has the technology been deployed? What are the remedy performance metrics?	
End State What is the end state objective of the site?	
Risk Describe the receptors, pathways, and human health/ecological/environmental risks that are driving the remedy.	
Path to site closure Describe the roadmap to site closure, including major milestones.	
Schedule Describe the site closure schedule and any regulatory milestones/deadlines.	
Regulatory Statutes/Drivers List the regulatory statutes/drivers that determine the remedy schedule. Include dates, if applicable.	
Stakeholders Describe the site stakeholders, which may include citizens, community, or environmental advocacy members; members of the affected public; or tribal stakeholders.	
Key Decisions and Dates List upcoming decision points, their relevance to path to closure, and the anticipated date.	
What are the top three challenges/impediments to site closure? Consider technical, regulatory, and stakeholder challenges, as listed below. Rank the challenges in order of significant with respect to impeding site closure. Technical Challenges: How is the system underperforming? What are the most probable technical causes? (See Technical Targets document) Regulatory Challenges: Why are baseline approaches not meeting regulator expectations? Stakeholder Challenges: Why are baseline approaches not meeting stakeholder expectations? What are some of the stakeholder core values that new approaches could harmonize with? (See Technical Targets document)	
How are the three challenges identified above currently being addressed, if they are?	
Stakeholders What are the primary objectives of the stakeholders? Which class of remedial alternatives are preferred by the stakeholders? Are there alternative beneficial end states that might benefit the community?	
Uncertainties Have inherent uncertainties been defined and analyzed for the site? What are the top three uncertainties?	
Risk	

What large-scale site activities or remedies are no longer reducing risk? Are any risks not being addressed with remedial actions?	
Remedy Transition What are potential remedy transition options (e.g., optimization, contingency remedy, reevaluation of CSM)?	
Beneficial Reuse Is there potential for beneficial reuse at the site? For example, reuse could be use of the land surface while establishing institutional controls to restrict subsurface use and ensure protectiveness of human health and environment.	
Technology Demonstration Potential How might the site be a candidate for a pilot technology demonstration?	

Appendix C: Environmental Management End State Vision Implementation Matrix

Environmental Management End State Vision

The Department of Energy Office of Environmental Management End State Vision for groundwater is to have in place for all groundwater areas of concern a final risk-informed remedy decision that is:

1) protective of human health and the environment for current and future anticipated land use,
2) inclusive of appropriate regulatory, community, Tribal Nation, and stakeholder acceptance,
3) respectful of equity, environmental justice, climate resilience, time, and budget factors,
4) sustainable (minimized operations, maintenance, labor, long-term monitoring, cost, potential future migration, risk, etc.) over the management life cycle, and
5) ready for transfer to Legacy Management, NNSA, or other appropriate entities for beneficial use.

Site / Area:

End State

Vision Component Description	**Description of How the Component is Met, Including the Names of Any Supporting Documents and/or Approved Regulatory Decisions**
Has an End State (e.g., residential, industrial, agricultural, recreational use, or long-term DOE stewardship) for the area been determined that meets the DOE-EM vision stated above? If so, has the End State received regulatory approval or is that pending? If the End State has not been determined, has the process started or is there an internal draft?	
Has the desired End State (and any land use controls) been reflected in regulatory decision document(s) (such as a Record of Decision or a permit)?	
Has a life cycle cost estimate been developed based on best available data and including a reasonable and prudent amount for stewardship?	
Is the area intended to be transferred to Legacy Management, to NNSA or another entity (i.e., community, local government, etc.)?	
If the area is intended for Legacy Management oversight, does the area meet requirements of Section 1 of the Legacy Management Site Transition Framework (https://www.energy.gov/sites/prod/files/framework.pdf)?	
Are there any identified needs for technical assistance with the End State development and related aspects?	
Please describe any contract issues that are impeding or preventing progress.	
Would incentives in the contract help accelerate closure? Would assistance in crafting appropriate incentives be useful?	
What issues remain or is help needed for transitioning the site?	

Groundwater Plume Control	
Vision Component Description	**Description of How the Component is Met Including the Names of Any Supporting Documents and/or Approved Regulatory Decisions**
Describe regulatory program under which groundwater remediation is being overseen (RCRA, CERCLA, UMTRCA, Federal or State Order, Federal Facility Agreement, etc.). If multiple regulatory programs are applicable, note which program is the lead.	
Have source areas and groundwater been sufficiently characterized to support a regulatory decision (such as a Record of Decision or a permitted remediation decision)? Describe the current stage of characterization (such as regulatory approval of a Remedial Investigation (RI) Workplan, RCRA Facility Investigation (RFI) Workplan, etc.).	
Has a risk assessment been conducted based on the future anticipated End State/land use? Describe the current stage of risk assessment based on the End State. Note any community or stakeholder concerns about the risk assessment or End State.	
Have all sources been controlled (e.g., through soil removal, soil cap, vadose zone treatment, etc.) to prevent continued release of contaminants to the groundwater? To what extent have source control actions been guided by risk management decisions?	
Have interim measures been implemented? Specify if the interim measure is active (such as pump and treat) or passive (such as monitored natural attenuation).	
Have groundwater remedial alternatives been identified/evaluated (such as a Focused Feasibility Study, Feasibility Study, Corrective Measures Study, etc.) and regulatorily approved?	
Has a proposed preferred remedial alternative (Statement of Basis, Proposed Plan) been prepared and placed on public notice for public review and comment?	
Has a groundwater remedy been selected (Record of Decision, Permit Decision)? Is the remedy active (such as pump and treat) or passive (such as monitored natural attenuation)?	
Has a remedial system design been regulatorily approved (such as a Remedial Design or Corrective Measures Design document)?	
Has the remedial system been implemented and the design/implementation regulatorily approved (such as a Remedial action, Corrective Measures Implementation or Permit Decision)?	
How frequently are periodic reviews of remediation performed?	
Has groundwater remediation been completed such that no further action is required?	
Has a long-term monitoring plan been regulatorily approved (such as a ROD, post-ROD document, Permit Decision)?	
Has an adaptive management approach been used at any point?	
Are there any identified needs for assistance related to groundwater plume control and remediation?	

Exposure Risk	
Vision Component Description	**Description of How the Component is Met Including the Names of Any Supporting Documents and/or Approved Regulatory Decisions**
Are all on-site and off-site potential human exposures controlled (versus partial control or no control)?	
Has a regulatory decision been made that supports the control of human health exposure?	
Are there other environmental exposure risk drivers (e.g., fish/aquatic species, flora, etc.) that are key to remedial decisions, and are they controlled?	
Are there any identified needs for assistance related to exposure risk?	
Stakeholder Engagement	
Vision Component Description	**Description of How the Component is Met Including the Names of Any Supporting Documents and/or Approved Regulatory Decisions**
Please describe the level of stakeholder involvement (such as, nothing beyond that required by regulation, a citizen's advisory board, on-going community meetings, regular engagement with elected officials).	
What is the frequency of involvement?	
Has the level of stakeholder engagement been adequate to support needed regulatory and/or NEPA actions?	
Is there a community involvement plan that includes the needed stakeholder groups and provides for regular, consistent, and sustainable framework?	
Are there any identified needs for assistance?	
Regulatory Engagement	
Vision Component Description	**Description of How the Component is Met Including the Names of Any Supporting Documents and/or Approved Regulatory Decisions**
Does the level and frequency of the meetings support the needed regulatory decisions for reaching End State in a timely manner?	
Is there an established framework of regular and sustainable discussions at the technical, management, and leadership levels?	

Are there any identified needs for assistance?	
Please describe any contract issues that are impeding or preventing progress.	
Would incentives in the contract help accelerate closure? Would assistance in crafting appropriate incentives be useful?	
What issues remain or is help needed for transitioning the site?	
Tribal Nation Engagement (if applicable)	
Vision Component Description	**Description of How the Component is Met Including the Names of Any Supporting Documents and/or Approved Regulatory Decisions**
Does the level and frequency of the meetings support the needed regulatory/NEPA actions in a timely manner?	
Is there a Tribal Nation accepted framework of regular discussions at the technical and leadership levels?	
Are there any identified needs for assistance?	
Please describe any contract issues that are impeding or preventing progress.	
Would incentives in the contract help accelerate closure? Would assistance in crafting appropriate incentives be useful?	
What issues remain or is help needed for transitioning the site?	