

Dispute Resolution Agreement

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

Issues Discussed:

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

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

Resolution:

The Parties agree that:

1. Subject to the terms and conditions of this agreement, the Parties agree to give their best efforts to work jointly to issue a Proposed Plan within approximately 60 days of executing this agreement.
2. The Proposed Plan will identify Central Bear Creek Valley (Site 7C) as the preferred location for onsite disposal of CERCLA mixed low level waste on the Oak Ridge Reservation.
3. The Proposed Plan will include a TDEC/EPA approved Field Sampling Plan (FSP) as an appendix. The FSP shall reflect mutual agreement of the parties to implement data collection identified in the "Statement of Work" provided by EPA and TDEC for Site 7C. The results and analysis of the field investigation in accordance with the FSP shall be included in the administrative record and the Proposed Plan public comment period shall be provided thereafter. This field investigation, and EPA/TDEC's review of the results thereof, shall be conducted prior to execution of the Record of Decision (ROD) and shall be used in selecting the remedy.
4. Per DOE Order 435.1, DOE will issue a preliminary Disposal Authorization Statement for onsite disposal of CERCLA mixed low level waste on the Oak Ridge Reservation prior to signing the ROD. DOE issued a letter to EPA and TDEC dated July 7, 2016 concerning "Response to Action from Environmental Program Council Meeting on May 24, 2016, Regarding Compliance with U.S. Department of Energy Order 435.1 for a New Onsite Disposal Facility." That letter stands and is incorporated by reference into this dispute resolution agreement.

Dispute Resolution Agreement

5. DOE shall provide funding to TDEC for FFA related oversight activities such as independent verification of modeling through a \$250,000 grant.
6. The attached RI/FS Appendix G preliminarily reflects the ARARs and TBCs. The ROD will determine the final version of Appendix G (and waivers with justification, if necessary) considering new information gathered after the Proposed Plan and all public comment received. Appendix G does not currently reflect agreement regarding DOE Order and Manual TBCs as citations, however the parties will resolve this issue prior to signature of the ROD



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

12/07/2017
Date



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

12/7/17
Date



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

Dec. 7, 2017
Date

**APPENDIX G:
APPLICABLE OR RELEVANT AND
APPROPRIATE REQUIREMENTS**

CONTENTS

ACRONYMS.....	G-4
1. INTRODUCTION.....	G-7
2. CERCLA ON-SITE CONSIDERATIONS.....	G-9
3. ROLE OF NUCLEAR REGULATORY COMMISSION REGULATIONS AND DOE ORDERS.....	G-10
4. TECHNICAL ARARS AND ARAR WAIVER REQUESTS.....	G-11
4.1 TSCA 40 CFR 761.75(B)(3).....	G-11
4.1.1 PCB Management and Disposal Practices on the ORR.....	G-12
4.1.3 Results of Risk Assessment and Related Fate and Transport Modeling for PCBs.....	G-14
4.2 TSCA 40 CFR 761.75(B)(5).....	G-15
4.2.1 PCB Management and Disposal Practices on the ORR.....	G-15
4.2.2 Equivalent or Superior Effectiveness of Engineered Features of the EMDF.....	G-15
4.3 TDEC 0400-20-11-.17(1)(H).....	G-17
4.4 TECHNICAL ARARS WITH ADDITIONAL NOTES.....	G-20
5. CHEMICAL-SPECIFIC ARARS/TBCS.....	G-20
5.1 SURFACE WATER QUALITY STANDARDS.....	G-20
5.2 RADIATION PROTECTION.....	G-21
6. LOCATION-SPECIFIC ARARS/TBCS.....	G-21
6.1 FLOODPLAINS/WETLANDS.....	G-22
6.2 AQUATIC RESOURCES.....	G-22
6.3 ENDANGERED, THREATENED, OR RARE SPECIES.....	G-22
6.4 CULTURAL RESOURCES.....	G-23
7. ON-SITE DISPOSAL ALTERNATIVES – ACTION-SPECIFIC ARARS/TBCS.....	G-24
7.1 GENERAL CONSTRUCTION STANDARDS – SITE PREPARATION, EXCAVATION ACTIVITIES, AND CONSTRUCTION.....	G-25
7.2 WASTE MANAGEMENT.....	G-25
7.2.1 Characterization.....	G-25
7.2.2 Storage.....	G-25
7.2.3 Waste Segregation.....	G-25
7.2.4 Waste Treatment and Disposal.....	G-26
7.2.5 Construction and Operation of an On-site Volume Reduction Facility.....	G-26
7.3 DISPOSAL SITE SUITABILITY REQUIREMENTS.....	G-26
7.4 WASTEWATER COLLECTION AND DISCHARGE.....	G-27
7.5 DESIGN, CONSTRUCTION, AND OPERATION OF A MIXED (RCRA HAZARDOUS, TSCA CHEMICAL AND LOW-LEVEL RADIOACTIVE) WASTE LANDFILL.....	G-27
7.6 CLOSURE.....	G-27
7.7 POST-CLOSURE CARE.....	G-28

7.8	ENVIRONMENTAL MONITORING DURING OPERATION, CLOSURE, AND POST-CLOSURE CARE.....	G-28
7.9	CONSTRUCTION AND OPERATION OF AN ON-SITE LANDFILL WASTEWATER TREATMENT SYSTEM.....	G-29
7.10	OFF-SITE TRANSPORTATION AND DISPOSAL.....	G-31
8.	OFF-SITE DISPOSAL ALTERNATIVE ACTION-SPECIFIC ARARS/TBCS.....	G-31
9.	REFERENCES	G-106

TABLES

Table G-1.	Numeric Ambient Water Quality Criteria (AWQC) that are Potential Chemical-Specific ARARs/TBCs for Key COCs in EMWMF/EMDF Landfill Wastewater ^a	G-33
Table G-2.	Chemical-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives	G-34
Table G-3.	Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives	G-38
Table G-4.	Action-specific ARARs and TBC Guidance (Siting Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives.....	G-52
Table G-5.	Action-specific ARARs and TBC Guidance (Design Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives.....	G-56
Table G-6.	Action-specific ARARs and TBC Guidance (Construction Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives.....	G-65
Table G-7.	Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives.....	G-70
Table G-8.	Action-specific ARARs and TBC Guidance (Environmental Monitoring Requirements – All Phases) for CERCLA Waste Disposal, On-site Disposal Alternatives	G-89
Table G-9.	Action-specific ARARs and TBC Guidance (Closure and Post-closure Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives	G-94
Table G-10.	Action-specific ARARs and TBC Guidance for Operation of an On-site Landfill Wastewater Treatment System, On-site Disposal Alternatives.....	G-99
Table G-11.	Action-specific ARARs and TBC Guidance for CERCLA Waste Disposal, Off-site Disposal Alternative.....	G-103

FIGURES

Figure G-1.	EBCV Site Slopes	G-17
-------------	------------------------	------

ACRONYMS

ACM	asbestos-containing material
AEA	Atomic Energy Act of 1954
ALARA	as low as reasonably achievable
ANOVA	analysis of variance
ARAP	Aquatic Resource Alteration Permit
ARAR	applicable or relevant and appropriate requirement
ARPA	Archaeological Resources Protection Act of 1979
AWQC	ambient water quality criteria
BCV	Bear Creek Valley
BMP	best management practice
CAA	Clean Air Act of 1970
CCC	criterion continuous concentration
CFR	<i>Code of Federal Regulations</i>
CMBST	combustion
CMC	criterion maximum concentration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COC	contaminant of concern
CWA	Clean Water Act of 1972
DEACT	deactivation
DOE	U.S. Department of Energy
DOE M	DOE Manual
DOE O	DOE Order
DOT	U.S. Department of Transportation
EBCV	East Bear Creek Valley
EIS	Environmental Impact Statement
EMDF	Environmental Management Disposal Facility
EMWMF	Environmental Management Waste Management Facility
EP	extraction procedure
EPA	U.S. Environmental Protection Agency
F&AL	fish and aquatic life
FEMA	U.S. Federal Emergency Management Agency
FFA	Federal Facility Agreement
FFCA	Federal Facility Compliance Agreement
FFS	Focused Feasibility Study
FR	Federal Register
FML	flexible membrane liner
GCL	geosynthetic clay liner
HMR	Hazardous Materials Regulations
HMTA	Hazardous Materials Transportation Act of 1975

ID	identification number
IRR	irrigation
LDR	land disposal restriction
LDS	leak detection system
LLW	low-level [radioactive] waste
LWTS	landfill wastewater treatment system
LWW	livestock watering and wildlife
MCL	maximum contaminant level
MOU	memorandum of understanding
NAAQS	National Ambient Air Quality Standard
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NESHAP	National Emission Standards for Hazardous Air Pollutants
NRC	Nuclear Regulatory Commission
NT	Northern Tributary (to Bear Creek)
ORR	Oak Ridge Reservation
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
POLYM	polymerization
PPE	personal protective equipment
PQL	practical quantitation limit
RCRA	Resource Conservation and Recovery Act of 1976
REC	recreation
RORG	recovery of organics
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RRL	required reporting limit
SDWA	Safe Drinking Water Act of 1974
SHPO	State Historic Preservation Officer
SLB	shallow land burial
TBC	to be considered [guidance]
TC	toxicity characteristic
TCA	<i>Tennessee Code Annotated</i>
TDEC	Tennessee Department of Environment and Conservation
THPO	Tennessee Historic Preservation Officer
TSCA	Toxic Substances Control Act of 1976
TSD	treatment, storage and disposal
TWRA	Tennessee Wildlife Resources Agency
TWRCP	Tennessee Wildlife Resources Council Proclamation
U.S.	United States
USC	<i>United States Code</i>
USGS	U.S. Geological Service

UTS	universal treatment standards
WAC	waste acceptance criteria
WWTU	wastewater treatment unit

1. INTRODUCTION

The purpose of this Appendix is to identify and describe applicable or relevant and appropriate requirements (ARARs) for the disposal alternatives considered in this Remedial Investigation/Feasibility Study (RI/FS). Development of ARARs is an iterative process. This list of ARARs and to be considered (TBC) guidance will be further evaluated and refined as more information becomes known about proposed remedies, and a detailed design is developed for a preferred remedy concurrent with the Proposed Plan stage. The final list of enforceable ARARs and TBCs will be set when the Record of Decision (ROD) is finalized.

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 121(d) (see United States [U.S.] Code Title 42, Chapter 103, Section 9621{d}), as amended, specifies that remedial actions for cleanup of hazardous substances must comply with requirements and standards under federal or more stringent state environmental laws and regulations that are applicable or relevant and appropriate to the hazardous substances or particular circumstances at a site, or obtain a waiver under 40 *Code of Federal Regulations* (CFR) 300.430 (f)(1)(i)(B) and (C). Inherent in the interpretation of ARARs is the assurance that protection of human health and the environment is ensured. This RI/FS evaluates waste disposition for the volume of CERCLA waste generated from cleanup actions on the U.S. Department of Energy (DOE) Oak Ridge Reservation (ORR) that exceeds the available capacity of the existing Environmental Management Waste Management Facility (EMWMF) in Bear Creek Valley on the ORR. The purpose of this appendix is to specify federal and state chemical-, location-, and action-specific ARARs for the On-site Disposal Alternatives (all sites)¹ for construction and operation of an additional CERCLA waste disposal facility referred to as the Environmental Management Disposal Facility (EMDF), the Off-site Disposal Alternative for transport of CERCLA waste to an approved off-site facility, and the Hybrid Disposal Alternative (a combination of on-site and off-site disposal). For the Hybrid Disposal Alternative, ARARs include all ARARs for each of the other two alternatives.

ARARs include federal and state environmental or facility siting laws/regulations designed to protect the environment and the public; they do not include occupational safety or worker radiation protection requirements. The U.S. Environmental Protection Agency (EPA) requires compliance with the Occupational Safety and Health Administration (OSHA) standards under Section 300.150 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) regulations at 40 CFR 300.150, independent of the ARARs process; therefore, the regulations promulgated by OSHA related to occupational safety are not addressed as ARARs. These regulations would appear in and be implemented by the appropriate health and safety plans for this action.

The following terms are used throughout this appendix:

- Applicable requirements are “those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.” (40 CFR 300.5).

¹ Several sites are proposed as locations to be considered for an on-site disposal facility in the Remedial Investigation/Feasibility Study. They are considered as distinct and individual Alternatives; however, as ARARs apply equally to all Site Options regardless of the location, the singular “Alternative” may be used throughout this appendix, as opposed to the plural “Alternatives”.

- Relevant and appropriate requirements are “those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.” (40 CFR 300.5).
- To be considered guidance is non-promulgated advisories or guidance issued by Federal or State governments, are not legally binding, and do not have the status of potential ARARs. The TBC category consists of advisories, criteria, or guidance developed by federal and state agencies that may be useful in developing CERCLA remedies per 40 CFR 300.400(g)(3). TBCs may be considered along with ARARs as part of the site risk assessment and may be used in determining the necessary level of cleanup for protection of health or the environment.

CERCLA on-site remedial response actions must comply only with the substantive requirements of a regulation related to federal, state, or local permits (CERCLA Section 121[e]). To ensure that CERCLA response actions proceed as rapidly as possible, EPA re-affirmed in the final NCP (59 Federal Register [FR] 47416, September 15, 1994) that on-site remedial response actions need only comply with substantive requirements. The term on-site means the real extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action. Substantive requirements pertain directly to actions or conditions at a site, while administrative requirements facilitate their implementation. EPA recognizes that certain of the administrative requirements (i.e., consultation with state agencies, reporting, etc.) are accomplished through the state involvement and public participation. These administrative requirements should also be observed if they are useful in determining cleanup standards at the site (59 FR 47416).

Federal Facility Agreement (FFA) (DOE 1992) participants have agreed that the DOE ORR CERCLA actions generating wastes and the disposal facility evaluated in that alternative are considered to be on the same site, with respect to addressing regulations that relate to transport of waste within a site or between sites. The basis for this determination is described in Chapter 2 of this Appendix.

In accordance with 40 CFR 300.400(g), ARARs and TBC guidance have been identified for the disposal alternatives evaluated in this RI/FS. In accordance with EPA guidance (EPA 1991), there are no ARARs/TBCs for the No Action Alternative. For the On-site Disposal Alternatives (all sites) and Hybrid Disposal Alternative, Tables G-1 and G-2 list the chemical-specific ARARs/TBCs; Table G-3 lists the location-specific ARARs/TBCs; and Tables G-4 through G-10 list the action-specific ARARs/TBCs.

Table G-11 provides the action-specific ARARs/TBCs for the Off-Site Disposal Alternative; these ARARs would also apply to the Hybrid Disposal Alternative. Chemical-specific and location-specific requirements may apply at the generator site or at the off-site disposal facility, but they are not ARARs for this alternative. See Chapter 8 for a discussion of ARARs given for the Off-site Disposal Alternative.

The On-site Disposal Alternatives (all sites) would comply with all ARARs with the exceptions as described below. DOE is requesting, for all proposed sites, that the FFA parties determine that a Toxic Substances Control Act of 1976 (TSCA) requirement may be waived as provided in 40 CFR 761.75(c)(4). The evidence for requesting this waiver is given in Chapter 4 of this Appendix. Under TSCA 40 CFR 761.75(c)(4) *Waivers*, evidence may be submitted to the Regional Administrator that operation of the landfill will not present an unreasonable risk of injury to health or the environment from polychlorinated biphenyls (PCBs) when one or more of the requirements of paragraph (b) *Technical Requirements* of 40 CFR 761.75 are not met. On the basis of such evidence and any other available information, the Regional Administrator may in his discretion find that one or more of the requirements of paragraph (b) of 40 CFR 761.75 is not necessary to protect against such a risk and may waive the requirements in any approval for

that landfill. Execution of a final Record of Decision for the proposed remedial action will constitute the sole mechanism for a Regional Administrator finding that one or more of the requirements of paragraph (b) of 40 C.F.R. 761.75 is not necessary to protect against such risk and provides justification for a waiver.

Further, an exemption will be requested for the Tennessee Department of Radiation Health requirement, at TDEC 0400-20-11-17(1)(h), which states that the hydrogeologic unit used for disposal shall not discharge ground water to the surface within the disposal site. The exemption, also called a variance or exception, is located at DRH rule, TDEC 0400-20-04-.08, which provides that the Department may, upon application by any person or upon its own initiative, grant exemptions, variances, or exceptions from the requirements of these regulations which are not prohibited by statute and which will not result in undue hazard to public health and safety or property. Execution of a final Record of Decision for the proposed remedial action will constitute the sole mechanism for a Departmental grant of exemption, variance or exception from the requirements of these regulations which will not result in undue hazard to public health and safety or property.

Evidence to support granting a waiver is given in Chapter 4 of this Appendix, along with evidence supporting the attainment of several other requirements. The grounds for invoking any proposed waivers is provided for in the RI/FS; any waiver/exemption request from ARARs will be provided in and granted through approval of the ROD.

2. CERCLA ON-SITE CONSIDERATIONS

CERCLA Section 121(e) exempts on-site CERCLA activities from administrative permitting requirements. The NCP, at 40 CFR 300.5, defines “on-site” as “*the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for the implementation of the response action.*” Disposal of waste in a newly constructed on-site disposal facility, proposed in the On-site Disposal Alternatives in this RI/FS, would consolidate wastes from cleanup of the ORR into a new disposal facility on the ORR. CERCLA Section 104(d)(4), discretionary authority to treat noncontiguous facilities as one site, also supports considering consolidation of waste between the individual sites as an on-site action and allows the EPA to consider multiple facilities as one for the purpose of conducting response actions where two or more noncontiguous facilities are reasonably related on the basis of geography, or on the basis of the threat or potential threat to the public health or welfare or the environment. The preamble to the NCP (at 55 FR 8690 [March 8, 1990]) clarifies that Section 104(d)(4) can be used when noncontiguous facilities are reasonably close to one another and wastes at the sites are compatible for a selected treatment or disposal approach. For purposes of not requiring a permit for the EMDF and the identification of ARARs, it is assumed that consolidation of wastes into a centralized disposal cell would be considered an on-site action under the CERCLA definition of “on site” and CERCLA Section 104(d)(4), as well as within the context of the FFA (see FFA Section IV, paragraph A).

Treating all areas of contamination within ORR as “on-site” for the purposes of waste disposal determinations is consistent both with the statute and EPA policy and was acknowledged and documented in the signed EMWMF ROD (DOE, 1999) and reaffirmed in the East Tennessee Technology Park Zone 2 ROD (DOE, 2005). An August 3, 1995, EPA memorandum from Stephen D. Luftig, Acting Director, EPA Office of Emergency and Remedial Response (EPA 1995) provides that, where federal facilities are listed on the National Priorities List, “*the CERCLA site consists of all contaminated areas within the area used to define the site.*”

By virtue of its location within the contiguous geographical boundaries of ORR, a single disposal facility would constitute a “suitable area in very close proximity to the contamination” in the case of areas of contamination on the ORR. Accordingly, it would be appropriate to consider such a disposal facility as “on-site” for the purposes of evaluating potential on-site disposal alternatives. The disposal facility analyzed in the On-site Disposal Alternatives would accept CERCLA wastes meeting the facility-specific waste acceptance criteria (WAC) from ORR sites and associated sites outside the ORR boundary but within the state of Tennessee that have been contaminated by the receipt or transport of material from past ORR operations conducted by DOE and its predecessors. No out-of-state waste would be accepted at the proposed disposal facility.

3. ROLE OF NUCLEAR REGULATORY COMMISSION REGULATIONS AND DOE ORDERS

Under the Atomic Energy Act of 1954 (AEA), the Atomic Energy Commission, had responsibility for the development and production of nuclear weapons and for both the development and the safe regulation of the civilian uses of nuclear materials. Under the Energy Reorganization Act of 1974, this function was split between two separate and unique agencies (NRC and DOE). DOE has responsibility for the development and production of nuclear weapons, promotion of nuclear power, and other energy-related work, as well as the regulation of defense nuclear facilities, and NRC has responsibility for the development and the safe regulation of civilian/commercial uses of nuclear materials. Unless a particular DOE facility is also a Nuclear Regulatory Commission-licensed facility, NRC low-level radioactive waste regulations [generally] are not considered legally applicable requirements at its environmental restoration sites.

NRC has promulgated regulations governing the facilities and activities it oversees and licenses. The regulations in 10 CFR 61 establish, for land disposal of radioactive waste, the procedures, criteria, and terms and conditions upon which the NRC issues licenses for the disposal of radioactive wastes containing byproduct, source and special nuclear material received from other persons. The regulations in 10 CFR 20 establish standards for protection against ionizing radiation resulting from activities conducted under licenses issued by the NRC. Note that both sets of regulations are legally applicable only to NRC-licensed facilities or activities.

Under its Agreement State program, NRC often relinquishes its regulatory authority over source, byproduct and special nuclear material to agreement states, authorizing them to administer NRC’s regulatory authority program in their state over licensed facilities. Tennessee is an “NRC Agreement” state.

Similarly, DOE is legally responsible for the management of nuclear materials at its facilities and has developed its own set of orders to carry out its statutory responsibilities under the AEA. DOE orders are not promulgated because they apply only to DOE facilities and operations, and do not apply to non-governmental entities, as NRC regulations do. Tennessee specifically exempts DOE and its contractors or subcontractors from its NRC-equivalent regulations in Tennessee Department of Environment and Conservation (TDEC) 0400-20-10-.06 and NRC exempts DOE from its definition of a “person” subject to its regulations in 10 CFR 20.1003. EPA’s ARARs guidance (EPA 1989a) recognizes DOE’s unique role, stating that “*most of DOE’s operations are exempt from NRC’s licensing and regulatory requirements*” and DOE’s requirements for “*radioactive waste management are spelled out in a series of internal DOE Orders...issued under the Atomic Energy Act [that] have the same force for DOE facilities or ‘within DOE’ as does a regulation.*” The manual further states that, “*Because DOE’s Orders typically incorporate requirements promulgated by other Federal agencies, they should be consistent with existing regulations.*” (pp. 5–17 to 5–18). DOE Manual (M) 435.1-1, *Radioactive Waste Management Manual*, is

generally consistent with and typically includes equivalent 10 CFR 61 requirements that are appropriate or “well-suited” to DOE sites and waste management operations.

After a lengthy review and discussion by the FFA parties, all agreed that certain of these NRC standards and DOE order requirements would be considered relevant and appropriate requirements and TBC guidance, respectively, for this CERCLA response action. These agreed-upon requirements are included in the ARARs tables.

4. TECHNICAL ARARS AND ARAR WAIVER REQUESTS

As a result of the engineering construction, site conditions, and anticipated type of waste planned for disposal in a proposed EMDF, DOE is seeking a waiver for two TSCA technical requirements. The request for a waiver is being sought under TSCA, at 40 CFR 761.75(c)(4)(Sections 4.1 and 4.2). An exemption will also be sought for the requirement at TDEC 0400-20-11-.17(1)(h) under the state DRH rule (TDEC 0400-20-04-.08) (Section 4.3) Justification as to the ability of the proposed remedies to meet those ARARs is discussed in detail in those sections. Because the standards of protectiveness for waivers in other regulatory regimes may be different than “protectiveness” under CERCLA, the CERCLA protectiveness standard will apply. Lastly, several technical requirements in the ARAR tables require specific additional information. Section 4.4 addresses those ARARs.

4.1 TSCA 40 CFR 761.75(b)(3)

Technical TSCA requirements for chemical waste landfills used for the disposal of PCBs and PCB items include 40 CFR 761.75(b)(3) relating to hydrologic conditions that states *“The bottom of the landfill shall be above the historical high groundwater table as provided below. Floodplains, shorelands, and groundwater recharge areas shall be avoided. There shall be no hydraulic connection between the site and standing or flowing surface water. The site shall have monitoring wells and leachate collection. The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high water table.”*

As none of the proposed disposal sites in Bear Creek Valley (BCV) meet two parts of this requirement (those two parts are underlined), and because the facilities can be designed without meeting these requirements and still be protective of human health and the environment, a waiver is being requested. Under 40 CFR 761.75(c)(4) *Waivers. “An owner or operator of a chemical waste landfill may submit evidence to the Regional Administrator that operation of the landfill will not present an unreasonable risk of injury to health or the environment from PCBs when one or more of the requirements of paragraph (b) of this section are not met. On the basis of such evidence and any other available information, the Regional Administrator may in his discretion find that one or more of the requirements of paragraph (b) of this section is not necessary to protect against such a risk and may waive the requirements in any approval for that landfill.* The waiver of the TSCA requirement shall be made as part of the CERCLA Record of Decision process. The CERCLA remedy protectiveness standard will apply in addition to the TSCA standard. Evidence and rationale in the following three categories is presented to support this waiver request:

PCB management and disposal practices on the ORR

Equivalent or superior effectiveness of site soils and engineered features of the EMDF

Results of risk assessment and related fate and transport modeling for PCBs

4.1.1 PCB Management and Disposal Practices on the ORR

ORR facilities [East Tennessee Technology Park (ETTP), Y-12, and Oak Ridge National Laboratory) manage TSCA-regulated materials, including PCBs. Because of the age of many ORR facilities and the varied uses for PCBs in gaskets, grease, building materials, and equipment, DOE self-disclosed unauthorized use of PCBs to EPA in the late 1980s. As a result, DOE Oak Ridge Environmental Management and EPA Region 4 consummated a major compliance agreement known as the “Oak Ridge Reservation Polychlorinated Biphenyl Federal Facilities Compliance Agreement” (DOE 2012) (ORR PCB FFCA), which became effective December 16, 1996, and was last revised on May 23, 2012. The modification in 2012 incorporated institutional controls at the closed Toxic Substances Control Act Incinerator at the ETTP where limited areas of contamination remain in place at the facility after the facility closure actions were completed. The institutional controls will remain in place until future PCB cleanup actions, which will be addressed during CERCLA demolition actions, are complete.

The ORR PCB FFCA provides a mechanism to address legacy PCB-use issues across the ORR. The agreement specifically addresses the unauthorized use of PCBs [e.g. - in ventilation ducts and gaskets, lubricants, hydraulic systems, heat transfer systems (electrical equipment such as transformers and capacitors)], and other unauthorized uses; storage and disposal of PCB waste; cleanup and/or decontamination of PCBs and PCB items including PCBs mixed with radioactive materials; PCB research and development; and ORR records and reporting requirements. A major focus of the agreement is the disposal of PCB waste. The ORR PCB FFCA established specific requirements related to PCB disposal including a compliance strategy with four sequential, interdependent phases: 1) preparation of a PCB/radioactive waste inventory; 2) identification of treatment/disposal options for PCB wastes; 3) evaluation and selection of preferred options for wastes; and 4) a PCB waste management plan and schedules (Attachment I to DOE 2012).

As a result of the compliance agreement, DOE and its contractor continue to notify EPA when additional unauthorized uses of PCBs, such as PCBs in paint, adhesives, electrical wiring, or floor tile, are identified. This notification process is routinely incorporated into the CERCLA documentation for demolition and remedial actions. EPA is updated annually on the status of DOE actions with regard to management and disposition of PCBs covered under the ORR PCB FFCA.

PCB waste generation, transportation, disposal, and storage at ETTP are regulated under EPA Identification Number (ID) TN0890090004. The removal of legacy PCB waste at Y-12 was completed in 2011 in accordance with the terms of the ORR PCB FFCA. PCB waste generation, transportation, and storage at ORNL are regulated under EPA ID TN1890090003.

The WAC for the EMWMF and proposed for EMDF do not (will not) allow for disposal of any liquids. ORR waste management practices dictate that inactive electrical equipment such as transformers and capacitors containing PCBs that are taken out of use are drained of PCB liquids and the drained liquids and carcasses are disposed of off-site through commercial vendors authorized by EPA for PCB disposal. Neither the liquids nor the electrical equipment are allowed for disposal in the EMWMF or proposed EMDF. In addition, other PCB containing equipment such as fluorescent light ballasts are systematically removed from buildings prior to demolition and disposed of through off-site commercial vendors. The ORR PCB FFCA addresses the requirements for management, removal, and disposal of PCB impregnated gaskets and ductwork contaminated with PCBs. The majority of PCB sources are systematically removed from buildings during pre-demolition decommissioning work when friable asbestos-containing materials (ACM) and universal wastes such as batteries and mercury-containing equipment and bulbs/lamps are removed. Project-specific waste management plans developed for building D&D and remedial actions under CERCLA include requirements to address PCB management and disposal that undergo review and approval by EPA and TDEC under the FFA for the ORR.

As a result of these in-place procedures on the ORR, disposal of PCB waste in the existing EMWMF has been limited to bulk PCB waste disposal (< 50 ppm), and has been confirmed in Waste Lot acceptance documents to date. It is expected that these procedures will continue in effect throughout operation of a future on-site disposal facility as well, thereby limiting all on-site disposal of PCB waste to < 50 ppm. This information is given as evidence that the proposed facility will not present an unreasonable risk of injury to health or the environment from PCBs when the requirements of 40 CFR 761.75(b)(3) are not met.

4.1.2 Equivalent or Superior Effectiveness of Site Soils and Engineered Features of the EMDF

The technical requirements for engineered features of chemical waste landfills defined in 40 CFR 761.75 (b) include two main components: 1) 4 ft of in place silt/clay soils or 3ft of compacted silt/clay soil liner thickness with a permeability $\leq 1 \times 10^{-7}$ cm/sec, and 2) a leachate collection system that can be a simple (single), compound (double), or suction lysimeter system. A synthetic membrane liner is used “if in the judgment of the Regional Administrator”, the hydrologic or geologic conditions require such a liner to provide a permeability equivalent to the soils noted above (i.e. $\leq 1 \times 10^{-7}$ cm/sec).

The engineered features proposed for the EMDF include RCRA and state solid waste required elements that exceed the 40 CFR 761.75 (b) requirements. These features are described and illustrated in detail in Section 6 of the RI/FS Report and in summary include: 1) a 5 ft thick liner system that includes two impermeable high density polyethylene (HDPE) liners that are (each) specified as 60 mil thickness for a total 120 mil thickness (TSCA requires only a single 30 mil liner), a geosynthetic clay liner, and two leachate collection drainage layers with a lower leak detection layer, 2) 10 ft of low permeability vadose zone geologic buffer material [per TDEC solid waste requirement 0400-11-01-.04(4)(a)(2)], and 3) a variable thickness of low permeability structural fill material and relatively low permeability in-situ silty clay residuum/saprolite material within low areas of topography. The entire top to bottom vertical sequence below the waste layer includes (layers with greater thickness and low permeability are noted in parentheses):

- Protective material layer (1ft)
- Geotextile separator layer
- Leachate collection drainage layer (1ft)
- Geotextile cushion layer
- Primary geomembrane liner (Liner #1 – 60mil HDPE)
- Geosynthetic clay liner ($\leq 1 \times 10^{-9}$ cm/sec)
- Geocomposite drainage layer/leak detection layer
- Secondary geomembrane liner (Liner #2 – 60mil HDPE)
- Compacted clay liner (3 ft $\leq 1 \times 10^{-7}$ cm/sec)
- Geologic buffer layer (10 ft $\leq 1 \times 10^{-5}$ cm/sec)
- Structural fill layer (variable thickness $\leq 1 \times 10^{-5}$ cm/sec)
- In-situ silty clay residuum soils and saprolite (variable thickness with relatively low permeability (10^{-4} to 10^{-7} cm/sec))
- Underdrain network designed to maintain the water table at depths ranging from 30-95 ft below the bottom of the waste

Application of these more stringent requirements under RCRA results in a facility which meets or exceeds the standards of performance provided by TSCA. The language of the TSCA requirement does not provide a true performance standard that can be evaluated. For example, gravel and highly fractured rock can have a hydraulic conductivity of as low as 1×10^{-1} cm/second, compared to a conductivity of up

to 1×10^{-7} cm/second for clay. For a continuous 50 ft layer, the range of time for permeation could be anywhere from 4.2 hours (gravel) to 482 years (clay). The engineered cell will use a multiple liner system that will incorporate flexible geomembranes, geosynthetic clay liners (GCLs) and low permeability clay. The range of hydraulic conductivities for these materials range from $< 1 \times 10^{-7}$ cm/second for low permeability clay; 5×10^{-9} cm/second for GCLs; and between 1×10^{-11} and 1×10^{-13} cm/second for geomembranes depending on the type of materials used. In addition to a leachate collection/detection system overlying a 3-ft thick clay foundation layer, a 10-ft geologic buffer composed of clay will be used to isolate the disposal cell from the groundwater table.

The final landfill cover (an 11 ft thick multilayer system with lateral drainage and low permeability layers) significantly reduces infiltration of water through the waste and along with the liner/geobuffer materials limits the potential for mobilization and exposure of PCBs and other waste constituents to the public and the environment. The sequence of engineered and in-situ materials proposed for the EMDF provides protection and redundancy well beyond the basic requirements for liners, leachate collection, and the 3-4 ft thick soil liner specifications defined for PCB disposal in chemical waste landfills stipulated in 40 CFR 761.75 (b). In addition, the underdrain networks provide a viable system for lowering the pre-existing water table and maintaining a significant thickness of unsaturated zone below the waste, liner, and geobuffer materials for those sites (Sites 5 and 14) where underdrains are incorporated in the facility concepts.

These engineered features (liner components; geologic buffer; and for some sites, underdrains) demonstrate equivalent or superior protectiveness to that provided under the TSCA hydrogeologic requirement, and limit the possibility of PCB releases that would present an “unreasonable risk of injury to health or the environment from PCBs”.

4.1.3 Results of Risk Assessment and Related Fate and Transport Modeling for PCBs

Additional evidence supporting the TSCA waiver comes from fate and transport modeling of contaminants of concern (including PCBs and other organic compounds). Model simulations of potential PCB migration and exposure via ground water migration have been completed to estimate risk over longer timeframes assuming that current and future planned land use controls no longer exist. The modeling simulates contaminant migration via ground water pathways from the waste cells through the unsaturated zone below the site and then laterally downgradient through the saturated zone to a domestic well supplying drinking water to a hypothetical family of four. The simulations and risk assessment also calculate risks to a maximally exposed individual associated with contaminated surface water that is used for crop irrigation and livestock watering. The modeling and risk assessment employ two particular representative PCB Aroclors (Aroclor-1221 and -1232) to evaluate potential PCB migration and risks. Hazardous, non-radiological organic contaminants such as PCBs were not modeled past 1,000 years due to their expected natural degradation in the environment well within the 1,000 year timeframe. The modeling results indicated that these PCBs would not peak until well after the 1,000 year timeframe at the proposed receptor locations. Thus PCBs would not pose a risk to human health.

Consumption of PCB-contaminated foods is the most significant route of exposure to PCBs for the general human population (National Academy Press 2001). This exposure typically occurs as a result of bioaccumulation of PCBs through the food chain from contaminated sediments and accumulations of PCBs in macroinvertebrates that are carried up through the food chain through fish to humans and wildlife. The streams at and near the EMDF site are quite small and have intermittent and relatively low base flow characteristics, limiting the potential for PCBs to enter the food chain via surface water/sediment pathways and human exposure through fish consumption. The streams within an approximately 2000 ft radius of the site do not include water of sufficient size or volume to sustain any

fish populations that could yield fish for human consumption. PCB dissolved phase aqueous migration from the waste cells (where PCBs occur in solid phase only and with relatively low bulk concentrations of PCBs) through extensive layers of underlying fine grained low permeability soils with high sorptive capacity would inherently limit the potential for PCB migration to the nearest stream channels where flood plain sediments are limited in length and areal extent.

PCBs have relatively low water solubility and low vapor pressures and tend to readily partition to organic matter in soils and sediments. The relatively low mobility of PCBs in the subsurface environment and high adsorption of PCBs to soil particles and organic compounds in combination with significantly reduced infiltrations rates within the landfill footprint suggest that PCB migration in the subsurface would be limited. The risk of exposure to human health and the environment would therefore be limited.

4.2 TSCA 40 CFR 761.75(b)(5)

Technical requirements for chemical waste landfills used for the disposal of PCBs and PCB items include this siting requirement regarding topography, *“The landfill site shall be located in an area of low to moderate relief to minimize erosion and to help prevent landslides or slumping.”* [40 CFR 761.75(b)(5) – TSCA regulations]. The proposed disposal sites in BCV are situated abutting the slopes of Pine Ridge, but the question has been raised regarding whether the slopes of the East (EBCV) and Central (CBCV) (Figure G.1) Sites meet the requirement as stated. The landfill in EBCV and CBCV can be engineered to remain protective of human health and the environment, and will minimize erosion and help prevent landslides/slumping, thus a waiver is being requested. Under 40 CFR 761.75(c)(4) *Waivers*. *“An owner or operator of a chemical waste landfill may submit evidence to the Regional Administrator that operation of the landfill will not present an unreasonable risk of injury to health or the environment from PCBs when one or more of the requirements of paragraph (b) of this section are not met. On the basis of such evidence and any other available information, the Regional Administrator may in his discretion find that one or more of the requirements of paragraph (b) of this section is not necessary to protect against such a risk and may waive the requirements in any approval for that landfill.* The waiver of the TSCA requirement shall be made as part of the CERCLA Record of Decision process. The CERCLA remedy protectiveness standard will apply in addition to the TSCA standard. Evidence regarding the low levels of PCBs expected to be disposed in this landfill (as with the technical requirement above) and equivalent or superior effectiveness of engineered features of the EMDF are presented to support the waiver request.

4.2.1 PCB Management and Disposal Practices on the ORR

As a result of these in-place procedures on the ORR, as given in the previous waiver discussion and evidence section, disposal of PCB waste in the existing EMWMF has been limited to bulk PCB waste disposal (< 50 ppm), and has been confirmed in Waste Lot acceptance documents to date. It is expected that these procedures will continue in effect throughout operation of a future on-site disposal facility as well, thereby limiting all on-site disposal of PCB waste to < 50 ppm. This information is given as evidence that the proposed facility will not present an unreasonable risk of injury to health or the environment from PCBs when the requirements 40 CFR 761.75(b)(5) of this section is not met.

4.2.2 Equivalent or Superior Effectiveness of Engineered Features of the EMDF

The intent of the siting criterion is to ensure long-term stability of the landfill by avoiding terrain that is prone to slope failure and intense runoff that could cause damaging erosion, landslides, or slumping. What exactly constitutes low, moderate, and high relief is not explicitly stated in the regulation and additional research did not provide a standard definition. Some slopes in the vicinity of the proposed landfills are steep. The EMDF footprint in EBCV is proposed for an area of moderate to steep existing slopes within the BCV along the southern flank of Pine Ridge. Existing grades range from less than 25%, flatter than 4 horizontal (H) to 1 vertical (V) over the majority of the footprint, to approximately 50%, 2H

to 1V for only a small portion of the footprint (see Figure G-1) on the north side of the footprint. As such, the landfill footprint is braced against Pine Ridge at the localized steep slope locations. Based on the general site descriptions within the RI/FS, there are no unstable ground areas subject to previous sliding that were identified. Stability is not only a function of slope angles, but also the materials in place and their properties. Should on-site disposal be selected for implementation, additional field investigations would be planned to support the design phase that would verify existing observations and further evaluate historic slope stability. Extensive geotechnical characterization studies will be performed to provide data for final design and the calculations required to analyze static slope stability for the proposed EBCV facility.

The existing natural slopes of Pine Ridge along Bear Creek Valley have not shown any indications of past or future landslides or slumping. Characterization efforts such as test pits, boreholes, well drilling logs, and corresponding laboratory testing have occurred at various locations down the valley and demonstrate the stability of the existing terrain. Problems could arise if the existing slopes of Pine Ridge were excavated incorrectly, but this has been a design consideration in the conceptual designs of the RI/FS. Avoiding undercutting along Pine Ridge was a primary driver in the conceptual designs for two reasons: 1) to avoid creating potentially unstable slopes above excavated areas and 2) to avoid intercepting any potentially shallow groundwater traveling down the ridge.

The relatively impermeable landfill features (cover system) will promote stability by reducing recharge in the area, as saturated soils are a primary cause of landslides and slumping. The landfill has been configured to improve overall landfill stability and associated existing slope stability through buttressing effects, control of groundwater beneath the landfill, and reducing erosional flow paths for surface water. The majority of the footprint (about three-fourths of the footprint area) lies on existing slopes of about 30% steepness or less, while only about one-fourth of the footprint is developed on the steeper slopes of Pine Ridge. Based on cross-sections presented within the RI/FS, the landfills creates a buttress against the ridge for creation of the geologic buffer and bottom liner systems which are sloped at a proposed slope of 3H to 1V – flatter than some existing grades on the ridge. When filled, the completed landfill creates a buttress fill that flattens sections of the ridge and puts a large stabilizing mass at the toe of the steepest slopes above the proposed site area. Further, the EMDF configuration controls surface water and groundwater through collection and rerouting drainage features that improve the overall stability of the landfill and associated existing slopes. Riprap armor and buttressing have been incorporated into the conceptual designs to further mitigate the potential for erosion and promote long-term stability. Diversion of upgradient surface water runoff is incorporated in the conceptual site design, to further reduce erosion at the site. As a final note, the EBCV Site upgradient north-side drainage area is a relatively small area totally only ten acres, with a quite narrow swath representing the path of storm water flow directed toward the landfill and requiring diversion (see Figure G-1), thus runoff that will be directed around the landfill using French and trench drains is limited in volume and velocity.

Any new slopes constructed as part of any landfill will use standard allowable (constructed) slopes which will then be validated through modeling and calculations. All of the landfills considered in the RI/FS use similar proposed slopes for the various phases of landfill construction. Slope failure is always a key issue in the design of any large earth structure, regardless of existing terrain. Landfill design involves rigorous seismic analysis and slope stability calculations. Volume 3 of the Remedial Design Report for EMWMF provides examples of the types of slope stability modeling and calculations that will be performed to ensure long-term stability, while Volume 1 of the report provides the quality assurance plans that are used to ensure that the landfill is constructed to the standards required to ensure long-term stability. The new facility will undergo this process as well as considering new seismic standards that have been implemented in recent years.

TSCA regulations do not explicitly identify seismic requirements; instead the siting requirement is given to promote the use of stable sites. However, explicit seismic requirements for the proposed landfill are

derived from RCRA requirements (40 CFR 264.18(a)(1)) and NRC siting requirements (TDEC 0400-20-11-.17(1)(i)), and are included in the ARARs for this landfill; they will be met. Meeting these requirements further demonstrates the ability of this site to fulfill the intent of the TSCA regulation at 40 CFR 761.75(b)(5).

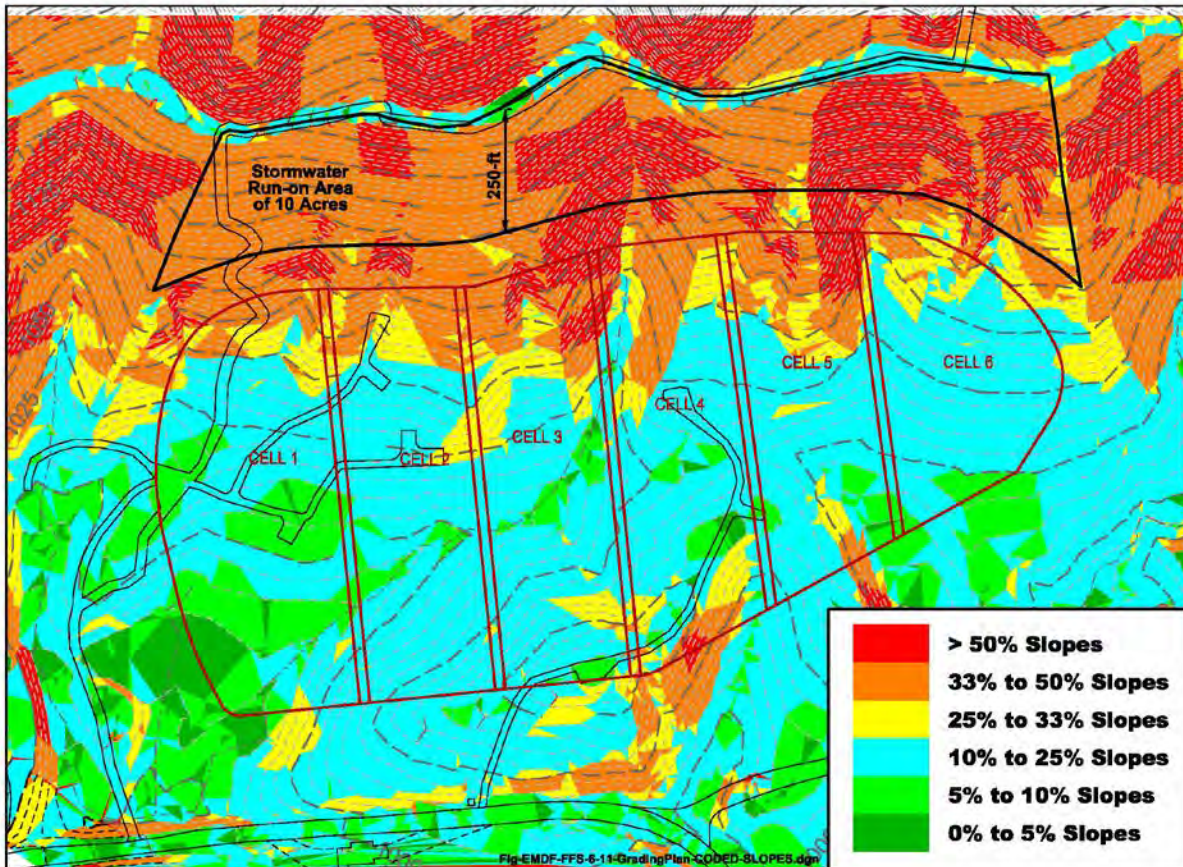


Figure G-1. EBCV Site Slopes

Slopes rated at 50% equates to 2H:1V slopes, 33% equates to 3H:1V, 25% equates to 4H:1V, and 10% equates to 10H:1V.

4.3 TDEC 0400-20-11-.17(1)(h)

This TDEC requirement, an NRC-based low level waste (LLW) disposal siting criterion, states “*The hydrogeologic unit used for disposal shall not discharge groundwater to the surface within the disposal site.*” The following definitions are given in TDEC 0400-20-11-.03:

- Hydrogeologic unit – *any soil or rock unit or zone which by virtue of its porosity or permeability, or lack thereof, has a distinct influence on the storage or movement of groundwater.*
- Disposal site – *portion of a land disposal facility which is used for disposal of waste. It consists of disposal units and a buffer zone.*

- Disposal unit – *discrete portion of the disposal site into which waste is placed for disposal.*
- Buffer zone – *portion of the disposal site that is controlled by the licensee and that lies under the disposal units and between the disposal units and the boundary of the site.*

NRC guidance (NUREG 0902) states the rationale of this criterion: *“This requirement will result in a travel time for most dissolved radionuclides at least equal to the travel time of the groundwater from the disposal area to the site boundary. In addition, this requirement should provide sufficient space within the buffer zone to implement remedial measures, if needed, to control releases of radionuclides before discharge to the ground surface or migration from the disposal site.”*

All of the alternatives have some indication of springs and seeps and stream tributaries and, as such, will not meet this requirement. DOE will seek an exemption from this requirement under TDEC 0400-20-04-.08, which provides that exemptions, variances, or exceptions from the requirements of these regulations may be granted so long as they are not prohibited by statute and will not result in undue hazard to public health and safety or property. On the basis of information presented in the RI/FS, this exemption appears to be warranted. The request for the exemption, variance or exception will be included and demonstrated in the ROD. Approval of the exemption, assuming that none of the characterization data contradicts the following description, will also occur in the ROD.

LLW land disposal facilities designed for the type of hydrogeologic setting encountered in East Tennessee rely on maintaining a sufficient thickness of unsaturated material between the waste and the water table to isolate the waste from groundwater, provide extended contaminant travel times, and ensure protection of human health and the environment. In addition, LLW land disposal facilities placed in this type of hydrogeologic setting must also rely on limiting acceptance of radionuclides and final inventories to further ensure the protection of human health and the environment.

All sites proposed for consideration will require grading to create a level base for construction. A geologic buffer of either in place soil, fill from cut areas, or purchased fill (all of which must meet specific low permeability requirements) is placed to ensure a minimum unsaturated material thickness of 10 feet above the seasonal high water table of the uppermost unconfined aquifer or the top of the formation of a confined aquifer [TDEC 0400-11-01-.04(4)(a)(2)]. Above this geologic buffer, the liner system is installed. The liner system includes three feet of compacted clay, geosynthetic layers, a one foot leachate collection drainage layer, and a final one foot protective material layer (five feet total), above which the waste is placed (consistent with RCRA requirements). The geosynthetic layers are low permeability materials that have been simulated in multiple independent tests to function for many centuries. These features will isolate the short-lived radionuclides so that decay occurs in place; therefore, they will minimize risk to human health or the environment (see discussion in main document Section 6.2.2.4.8). The geosynthetic materials ensure that leachate does not contaminate the underlying groundwater during the service life of the synthetic liner components. These three features (geologic buffer, liner, and geosynthetics within the liner) along with the material specifications they must meet (e.g., per RCRA) exceed design requirements specified in the TDEC NRC-based *Licensing Requirements for Land Disposal of Radioactive Waste* (TDEC 0400-20-11), which does not require any material, liner, or other engineered feature between the waste and the hydrogeologic unit used for disposal.

The conceptual design for the EMDF at all BCV candidate sites incorporates a minimum 15 ft vadose (unsaturated) zone, comprised of the liner and geobuffer between the waste and high water table. Conceptual designs of several sites proposed for consideration include engineered underdrain systems installed beneath the geobuffer to capture and divert groundwater discharge and maintain the minimum thickness of the vadose interval. In addition, in-situ and structural fill materials incorporated to level the footprint provide additional vadose zone thickness beneath portions of the waste for all sites, greatly

increasing depths to groundwater in those limited areas. Minimally, vadose zone depths are thus 15 ft, with maximum depths in isolated areas at some sites reaching 90 ft. In the event that contaminants are released from the waste, this underlying vadose zone depth (minimum of 15 ft which includes 3 ft of low hydraulic conductivity clay) provides an extended travel time that would increase the travel time of groundwater from the disposal area to the site boundary as targeted by the siting criterion.

After closure of the landfill facility, the 11 foot final cover system, which also includes geosynthetic layers, ensures that recharge to the footprint is limited for hundreds and up to thousands of years, minimizing release of contaminants and further ensuring that groundwater tables remain lowered. In addition, maintenance and monitoring of the leachate collection and leak detection systems along with required groundwater monitoring (e.g., RCRA Subpart F) will provide indications of potential releases of radionuclides to groundwater and permit the implementation of remedial measures prior to discharge to the ground surface or migration from the disposal site.

Limiting the acceptance of radionuclides during operations and limiting the final inventory of those contaminants allowed at closure of the facility will also provide a significant measure of protectiveness. Determination of these limits for a proposed site will take into account site-specific conditions and consider failure scenarios and their outcomes, to ultimately set limits that ensure human and environmental protectiveness are met per Remedial Action Objectives given in this RI/FS.

In totality, the facility conceptual designs' engineered features for all sites, and radionuclide contaminant limits that will be enforced, ensure protection of groundwater above and beyond the NRC requirement's intended outcome. The above information is provided in support of an exemption, variance or exception of TDEC 0400-20-11-.17(1)(h), by demonstrating the substantive means by which the NRC-derived requirements are met or exceeded. On the basis of information presented in the RI/FS, this exemption appears to be warranted. The exemption to the DRH requirement shall be made as part of the CERCLA Record of Decision process. The CERCLA remedy protectiveness standard will apply in addition to the DRH standard.

4.4 TECHNICAL ARARS WITH ADDITIONAL NOTES

A limited number of ARARs provided in Tables G-2 through G-8 require notes to provide some clarification. The following list addresses those ARARs, and the notes that apply.

- **Table G-2, 40 CFR 61.93(b)(4)(i) and TDEC 1200-03-11-.08(6)**, [*Note: DOE has an ORR-wide radionuclide emissions monitoring program in place to comply with these requirements under 40 CFR 61, Subpart H. Adherence to the ORR-wide National Emission Standards for Hazardous Air Pollutants (NESHAPs) monitoring program will constitute compliance with this ARAR requirement.*]
- **Table G-4, TDEC 0400-12-02-.03(2)(e)(1)(i)(III)**, [*Note: The demonstration referred to here will be a description of how corrective action would be implemented.*]
- **Table G-4, 40 CFR 761.75(b)(3)**, [*Note: A waiver under TSCA will be requested for certain of these requirements.*]
- **Table G-4, 40 CFR 761.75(b)(5)**, [*Note: A waiver under TSCA will be requested for this requirement.*]
- **Table G-4, 40 CFR 761.75(c)(4)**, [*Note: Waiver of any technical requirement shall be made as part of the CERCLA Record of Decision process. The CERCLA remedy protectiveness standard will apply in addition to the TSCA standard.*]
- **Table G-4, TDEC 0400-20-11-.17(h)**, [*Note: The exemption, variance or exception from the requirement shall be made as part of the CERCLA Record of Decision process. The CERCLA remedy protectiveness standard will apply in addition to the DRH standard.*]
- **Table G-4, TDEC 0400-20-11-.16(1); TDEC 0400-20-11-.17(1)(c, d, g, h, i, j, k); and 0400-20-11-.17(2)(b, c)**, [*Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).*]

5. CHEMICAL-SPECIFIC ARARs/TBCs

Chemical-specific ARARs and TBC guidance provide health- or risk-based concentration or discharge limitations in various environmental media (i.e., surface water, groundwater, soil, and air) for specific hazardous substances, pollutants, or contaminants. There are chemical-specific ARARs for the remediation and discharge of landfill wastewater under the four proposed action alternatives in the Integrated Water Management Focused Feasibility Study (FFS). Those chemical-specific ARARs are incorporated into this RI/FS and listed in Tables G-1 and G-2 for the On-site Disposal Alternative. There are also chemical-specific ARARs limiting exposure to radioactivity identified for the On-site Disposal Alternatives (see Table G-2) that are discussed below.

5.1 SURFACE WATER QUALITY STANDARDS

Surface water bodies in Tennessee are assigned use classifications by the Tennessee Water Quality Control Board. Those use classifications are not assigned based on surrounding land uses, and may have no relationship to how the surface water is currently being used. Tennessee surface water use classifications are listed in TDEC 0400-40-04. Bear Creek, near the EMWMF and the proposed EMDF, is classified by the state for Fish and Aquatic Life (FAL), Recreation (REC), Irrigation (IRR), and Livestock Watering and Wildlife (LWW) uses. All other named and unnamed surface waters in the Clinch River Basin, with the exception of wet weather conveyances, which have not been specifically named in the regulations, are classified for FAL, REC, LWW, and IRR uses per TDEC 0400-40-04-.09. Each of the use classifications has water quality standards set under TDEC 0400-40-03, although only the FAL and REC

uses have specific numeric ambient water quality criteria (AWQC) set for particular compounds. The REC AWQC are human health criteria and the FAL criteria are set for the protection of aquatic life. All of these criteria, both numeric and narrative, are all potential ARARs for any effluent discharges to Bear Creek. How and where the specific effluent limits would be applied and enforced should the selected remedy include an on-site water treatment facility at the EMWMF/EMDF, would be specified in the final decision document for this action under full oversight and approval by the regulatory authorities and as agreed to by the FFA parties.

A preliminary subset of key contaminants of concern in the leachate/contact water has been identified and agreed to by the FFA parties; this subset has been used during the development and screening of remedial alternatives in the FFS. AWQC for this subset of contaminants of concern are listed in Table G-1. Other narrative water quality standards are included in Table G-2 as potential chemical-specific ARARs.

Per TDEC 0400-40-05-.10(4), effluent discharges are required to meet the anti-degradation requirements of TDEC 0400-40-03-.06 to ensure that new or increased discharges do not cause measurable degradation of any parameter that is “unavailable.” Unavailable parameters exist where water quality is at, or fails to meet, the levels specified as water quality criteria in TDEC 0400-40-03-.03.

5.2 RADIATION PROTECTION

TDEC 0400-20-11-.16(2) contains a numeric performance objective for all LLW land disposal facilities that states “Concentrations of radioactive material which may be released to the general environment in groundwater, surface water, air, soil, plants or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid and 25 millirems to any organ of any member of the public. Reasonable effort shall be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable (ALARA).” This objective will be met for all radioactive material releases to the environment from the disposal cell and from any accompanying on-site landfill wastewater treatment system that may be constructed under the on-site disposal alternative. Landfill wastewater treatment is discussed in Section 7.4.

EPA Guidance Office of Solid Waste and Emergency Response Directive 9200.4-18 (EPA 1997) establishes cleanup levels for CERCLA sites with radioactive contamination. Responses to radionuclide releases will be consistent with this guidance, which establishes cleanup levels based on the NCP range of an excess upper bound lifetime cancer risk to an individual of between 10^{-4} to 10^{-6} (40 CFR 300.430[e][2](i)[A][2]). The guidance states that analysis indicates that if sites were cleaned up under a 25/75/25 mrem/yr dose limit, the residual contamination would correspond to approximately 10 mrem/yr EDE.

6. LOCATION-SPECIFIC ARARS/TBCS

Location-specific requirements (see Table G-3) establish restrictions on siting or requirements for how activities will be conducted solely because they will take place in special locations (e.g., wetlands, floodplains, critical habitats, historic districts, streams, presence of threatened or endangered species). Additional location-specific ARARs place restrictions on certain site attributes, such as hydrogeology or seismicity that could affect the performance of a remedy. The location-specific ARARs discussed here are based on the siting of the proposed EMDF in East Bear Creek Valley immediately east of EMWMF. The Off-site Disposal and No-Action Alternatives would not impact any special locations.

6.1 FLOODPLAINS/WETLANDS

Activities that affect wetlands are regulated under federal and state law. Impacts to wetlands from siting a new disposal facility would be avoided whenever possible. If impacts were unavoidable, they would be minimized through steps such as project design changes or the implementation of best management practices (BMPs), erosion and sedimentation controls, and site restoration.

As described in Appendix E of this RI/FS, several wetlands have been identified within or near the EMDF site. If an On-site Disposal Alternative is the selected remedy in the ROD, certain wetlands would be destroyed or adversely impacted and compensatory mitigation in the form of wetland restoration, creation, or enhancement would be carried out as required.

The conceptual design footprint of the EMDF, leachate storage tanks, contact water basins, access roads, and sediment basins are not within the 100-year or 500-year floodplain of Bear Creek for any of the proposed sites. However, if the final EMDF, including the wastewater treatment facility, is sited in an area away from the EMWMF requiring piping of wastewater to the water treatment facility, piping may need to be laid in a floodplain. Therefore, regulations regarding potential impacts on floodplains are included in Table G-3 for the On-site Disposal Alternative. Construction activities at the EMDF site would involve some disturbance of wetlands and aquatic resources and ARARs regarding those activities are included in Table G-3; mitigation activities are therefore assumed in the on-site cost estimate.

6.2 AQUATIC RESOURCES

The Fish and Wildlife Coordination Act of 1958 requires federal agencies to consider the effect of water-related projects on fish and wildlife resources and take action to prevent loss or damage to these resources. The provisions of the Act are not applicable to those projects or activities carried out in connection with land use and management programs carried out by federal agencies on federal lands under their jurisdiction; however, the provisions may be relevant and appropriate for such activities.

The TDEC Division of Water Pollution Control requires Aquatic Resource Alteration Permits (ARAPs) for alterations of waters of the state, including wetlands. Typical actions that trigger these requirements include the impoundment, diversion, stream location, or other control or modifications of any body of water or wetland. General permits are available for alteration of wet-weather conveyances, minor wetland alterations, minor road crossings, utility line crossings of streams, bank stabilization, sand and gravel dredging, debris removal, construction of a new intake and outfall structure, and stream and restoration habitat removal. Since this project would be implemented under CERCLA, proposed activities for development of an on-site disposal facility would be required to meet only the substantive requirements under the applicable General permit or individual ARAP process, including such elements as BMPs and erosion and sedimentation controls.

Implementation of the on-site EMDF would require substantial modification of NT-3 (i.e., construction over a portion of NT-3), site improvements, and potential construction of new bridges or culverts that would impact existing wetlands. Other direct impacts to aquatic resources are not expected to be required, based on the conceptual design. Actual design considerations will determine whether and to what extent aquatic impacts will occur.

6.3 ENDANGERED, THREATENED, OR RARE SPECIES

Tennessee lists state-specific threatened, endangered, and in-need-of-management animal species in Tennessee Wildlife Resource Conservation Proclamations (TWRCPs) 00-14 and 00-15, which supersede TWRCPs 94-16 and 94-17. The TDEC Division of Natural Areas Natural Heritage Program Rare Animal List (2009) was also consulted. The Tennessee endangered plant species are listed in

Rule 0400-06-02-.04. The TDEC Division of Natural Areas Tennessee Natural Heritage Program Rare Plant List (2012) was also consulted for threatened and special status species.

As described in Appendix E, the East Bear Creek Valley (EBCV) site is not known to contain plants that are threatened or endangered, in need of management, or species of concern (Collins, et al, 2015; Baranski 2009). A biologic and wetlands survey was conducted of the EBCV site, and no rare or status plants or habitats were identified within the area. If such plants were later discovered in the area, they would be protected and preserved per the Tennessee Rare Plant Protection and Conservation Act of 1985. The Tennessee dace (*Phoxinus tennesseensis*), which is listed as a “species in need of management” by the state of Tennessee and known to occur in Bear Creek and several of its tributaries, was not found in NT-3 upstream of the Haul Road. Should any actions associated with the selected remedy impact any state-listed threatened or rare animal species or habitat, impacts would be considered and mitigated as appropriate in accordance with the Tennessee Nongame and Endangered or Threatened Wildlife Species Conservation Act.

Bald eagles, as well as the gray bat, the Indiana bat and the northern long-eared bat are known to inhabit the ORR. Although a biologic survey did not identify any in the EMWMF and the proposed EMDF project areas, there are trees in the area that could be potential nesting habitat for these species. The U.S. Fish and Wildlife Service (FWS) has established restrictions and guidance on tree cutting and felling which are designed to protect endangered and threatened animal species and their habitat. ORR land managers are required to comply with these restrictions, either by limiting tree removal to designated times of the year or by having the ORR Natural Resources Manager inspect and clear the trees for removal. Tree cutting should be carried out from November 15 to March 31 where possible to meet FWS bat conservation guidelines. Other tree cutting guidelines specific to the ORR are available from the ORR Natural Resources Manager.

DOE has signed a Memorandum of Understanding (MOU) with the FWS regarding implementation of Executive Order 13186 “Responsibilities of Federal Agencies to Protect Migratory Birds” (September 12, 2013). The MOU requires DOE to coordinate with the FWS prior to DOE operations and activities with significant adverse effects on migratory birds and their habitats, and to initiate appropriate actions to avoid or minimize the take of migratory birds. Although the MOU and the consultation it requires might be considered an administrative requirement under CERCLA, DOE will take appropriate actions, as necessary, to avoid or minimize the take of migratory birds as required by Executive Order 13186, which is listed as a TBC in Table G.3, should any migratory birds or their habitats be identified in the project area during implementation of the remedy.

6.4 CULTURAL RESOURCES

There are no known significant historical or archaeological resources within the EMDF proposed footprints, support facilities, or roadways (see Appendix E). No prehistoric sites are known to exist at the EMDF site and adjacent areas to be impacted by the proposed construction of support facilities and roadways. If such resources (e.g., Native American remains) are discovered during site grading and excavation activities, work will be suspended until applicable requirements are met. Several statutes and regulations protect cultural resources, such as Native American artifacts, that may be discovered. For the On-site Disposal Alternative, if such a discovery is made at any time during the project, it must be reasonably protected from disturbance and all activity in the discovery area must cease until the site and artifacts are properly evaluated.

7. ON-SITE DISPOSAL ALTERNATIVES – ACTION-SPECIFIC ARARs/TBCs

Under the On-site Disposal Alternatives, most future-generated CERCLA waste in excess of the EMWMF capacity would be disposed of in a centralized, newly constructed engineered disposal facility on the ORR. This facility would be designed to manage radioactive low-level waste (LLW), RCRA characteristic waste, polychlorinated biphenyl (PCBs), and mixed waste consisting of combinations of these waste types. The anticipated small portion of CERCLA waste that does not meet the disposal facility WAC (see Chapter 2, Section 2.1.3 of the main RI/FS document), including a minimal volume of disposal facility operations waste, would be shipped to an off-site commercial facility for disposal by the generating project and is not considered part of this analysis nor part of the On-site Disposal Alternative.

Performance, design, or other action-specific requirements set controls or restrictions on particular kinds of activities related to the management of hazardous waste under the selected remedy (55 FR 8741, March 8, 1990). No one set of regulations is tailored to the combination of wastes which will be disposed. Selection of action-specific ARARs for the On-site, Hybrid, and Off-site Disposal Alternatives is based on the overriding priority to manage wastes in a manner protective of human health and the environment over both the short-term and long-term. As previously stated, there are no ARARs for the No Action Alternative.

Action-specific ARARs for the On-site and Hybrid Disposal Alternatives (see Tables G-4 through G-10) address:

- Siting requirements (Table G-4)
- Design requirements (Table G-5)
 - General landfill design
 - Landfill liner system
 - Storm water control for landfill
 - RCRA tanks system and
- Construction requirements (Table G-6)
- Operations requirements (Table G-7)
 - Emissions and effluents (note that most ARARs under this subheading are currently incorporated in the FFS (see Section 7.4)
 - Secondary waste and waste acceptance criteria attainment
 - Construction and operation of an on-site volume reduction facility
 - Transportation
 - General operations
- Environmental monitoring requirements (Table G-8)
 - Pre-operations monitoring
 - Operations and closure/postclosure monitoring
- Closure and post-closure requirements (Table G-9)
- Operation of an on-site wastewater management facility (Table G-10)

A key assumption is that requirements for storage before transport, transportation requirements for moving wastes from individual response sites to the on-site disposal facility, and requirements for treatment of these wastes are not ARARs for the On-site or Hybrid Disposal Alternatives because these requirements will be met by the individual waste generators prior to placement in the on-site facility.

Some wastes (e.g., decontamination and decommissioning waste that exceeds WAC for the on-site disposal facility) may be managed at the generator site pending shipment to an off-site facility for treatment or disposal. In the event waste is determined to exceed WAC after receipt at the on-site disposal facility, the waste would be returned to the generator.

7.1 GENERAL CONSTRUCTION STANDARDS – SITE PREPARATION, EXCAVATION ACTIVITIES, AND CONSTRUCTION

Site preparation activities, such as excavation, earth-moving operations, and construction of support buildings would trigger requirements to prevent and minimize emission of radioactivity, fugitive dust, and storm-water runoff. These requirements, as listed in Table G-6, are ARARs for general construction activities under the On-site and Hybrid Disposal Alternatives. Reasonable precautions include the use of BMPs for erosion prevention and sediment control to prevent runoff and application of water on denuded surfaces to prevent particulate matter from becoming airborne.

7.2 WASTE MANAGEMENT

Table G-7 lists ARARs and TBC guidance for characterization and management of different types of waste streams.

7.2.1 Characterization

All primary wastes (e.g., soil, scrap metal, and debris) delivered to the On-site EMDF and secondary wastes (e.g., contaminated personal protective equipment, dewatering fluids, decontamination wastewaters) generated during facility construction, operations, or closure will be appropriately characterized as either solid, hazardous, PCB-contaminated, radioactive, and/or mixed wastes and managed in accordance with appropriate RCRA, Clean Air Act of 1970 (CAA), TSCA, or DOE requirements for each waste stream. Requirements for characterization and management of waste are triggered in all phases of implementation of the On-site and Hybrid Disposal Alternatives. Other projects generating waste to be disposed of at an on-site (or off-site) facility are responsible for characterizing waste per these requirements and to confirm that the waste meets the disposal facility's WAC. These waste streams must be characterized and managed as RCRA waste, TSCA waste, LLW, or mixed waste as appropriate.

7.2.2 Storage

RCRA-hazardous waste may be accumulated and temporarily stored in containers on-site provided that the containers meet substantive RCRA requirements and are properly marked as hazardous waste. Containers may be stored on-site provided that container integrity is ensured and precautions to prevent release of the waste are taken.

Storage areas must be properly designed and operated such that containers are not in prolonged contact with liquid from precipitation, and the area will contain any spilled materials. PCBs and PCB items must be properly marked and stored in containers per TSCA requirements. PCB and PCB radioactive waste may be stored in a PCB storage facility, or in a RCRA compliant storage facility.

7.2.3 Waste Segregation

TSCA waste must be segregated from incompatible wastes during management and storage. LLW should be segregated from mixed waste. ARARs addressing this segregation [for example 40 CFR 761.75(b)(8)] would be implemented through operations plans and procedures for an on-site facility.

7.2.4 Waste Treatment and Disposal

RCRA waste may be land disposed only if it meets treatment standards or alternative treatment standards for hazardous waste (40 CFR 268) and requirements for ignitable, reactive, and incompatible waste. Hazardous waste may not be disposed of as free liquids and empty containers should be reduced in volume (e.g., shredded, compacted) prior to disposal. Treatment to meet LDRs will be accomplished.

Bulk PCB remediation waste, other PCB cleanup wastes, and PCB bulk product waste may be disposed of in a RCRA-compliant land disposal facility or a chemical waste landfill or by performance or risk-based options per 40 CFR 761.61(b)(2).

Potentially biodegradable LLW bearing uranium and thorium shall be conditioned to minimize the generation and escape of biogenic gases. LLW must have structural stability by processing or packaging of the waste; void spaces must be reduced to the extent practicable.

Secondary waste generation (e.g., landfill wastewaters) will be managed per requirements under RCRA and TSCA, which would be implemented through operations plans and procedures for an on-site facility.

7.2.5 Construction and Operation of an On-site Volume Reduction Facility

A separate facility dedicated to mechanical size reduction of waste debris will be constructed and operated on site in the Hybrid Disposal Alternative and the Option 1 Off-site Disposal Alternative. The facility will provide staging areas and equipment to conduct mechanical size reduction of debris. Because this facility will be handling debris likely contaminated with radioactive and possibly hazardous contaminants, the facility will be constructed and operated in accordance with RCRA requirements for a miscellaneous treatment facility. It is possible that there may be air pollutant emissions from this facility, although the amounts are not expected to be large enough to be considered a “major source” or to exceed emission thresholds and offset ratios allowed under CAA regulations. The air regulations and available exemptions will be reexamined as ARARs as facility design is further developed and refined.

7.3 DISPOSAL SITE SUITABILITY REQUIREMENTS

Siting and design requirements for land disposal facilities for RCRA-hazardous waste and LLW stipulate that facilities not be located in a 100-year floodplain or areas subject to seismic activity that could adversely affect the facility’s stability or ability to meet performance standards. Performance standards for the facility include the requirement to achieve long-term stability of the disposal site.

Location requirements for a chemical-waste landfill under TSCA are very similar to RCRA requirements for a hazardous waste landfill. However, the hydrologic requirements of TSCA specify that the bottom of the landfill liner system or natural in-place soil barrier must be located at least 50 ft above the historical high water table and prohibit any hydrologic connection between the site and any surface water. This depth requirement applies to all sites, regardless of underlying geology and soil type. The proposed EMDF locations will not meet the TSCA hydrologic requirement. As noted in Chapter 4 of this Appendix, two TSCA waivers to TSCA hydrologic and topographic requirements will be requested in the final Record of Decision on the basis that the proposed facility at the locations examined will not present an unreasonable risk of injury to health or the environment from PCBs if the requirements at 40 CFR 761.75(b)(3) and 40 CFR 761.75(b)(5) cannot be met.

With the exceptions as noted above, implementation of the On-site Disposal Alternatives (all sites) would meet all CERCLA ARARs. .

7.4 WASTEWATER COLLECTION AND DISCHARGE

Non-contact storm water generated during construction, operations, closure and post-closure will be collected in sedimentation basins to allow solids to settle out, and then will be released to surface streams.

At the request of TDEC and the EPA, a separate FFS that addresses landfill wastewater management for both the EMWMF and the EMDF has been prepared in parallel with this RI/FS. The FFS identifies several landfill wastewater management alternatives and provides appropriate ARARs. The preferred alternative and ARARs from this RI/FS and the FFS will be merged into a selected remedy and ARARs in the ROD.

7.5 DESIGN, CONSTRUCTION, AND OPERATION OF A MIXED (RCRA HAZARDOUS, TSCA CHEMICAL AND LOW-LEVEL RADIOACTIVE) WASTE LANDFILL

Tables G-4 through G-9 list RCRA and TSCA ARARs regarding design, construction and operation of a mixed waste landfill. RCRA and TSCA requirements regarding design and maintenance of a security system and access roads are applicable. TSCA requires pre-construction baseline sampling and sampling during operations of groundwater and surface water. TSCA specifies leachate collection and liner design requirements for the landfill. If a synthetic liner is used, it must have a minimum thickness of 30 mils.

CERCLA differentiates between substantive and administrative requirements. Some requirements that would be considered administrative for most CERCLA response actions (and therefore would not be identified as ARARs) have nevertheless been identified as ARARs for the On-site and Hybrid Disposal Alternatives because they are necessary to meet substantive requirements for an operating disposal facility. Operation of the on-site disposal facility will be in compliance with general facility requirements for security, inspection, training, construction quality assurance, contingency planning, preparedness and prevention, and inventory as identified in Table G-7.

RCRA regulations require that the landfill design must prevent leachate generation and release of hazardous constituents to groundwater. Requirements stipulate that a disposal facility needs two or more liners, including a top liner and a bottom liner each with a leachate collection and removal system. The bottom liner will include a leak detection system. Facility design must also provide for run-on/runoff control systems and wind dispersion control systems. Construction and operation requirements include construction and post-construction inspections.

Mercury-contaminated wastes (i.e., those that fail the Toxicity Characteristic Leaching Procedure because of mercury) will be treated to meet land disposal restrictions (LDRs) as required in 40 CFR 268.

7.6 CLOSURE

After a disposal cell is filled to capacity, pursuant to RCRA, it must be covered with a final cover designed and constructed to provide long-term minimization of liquid migration through the capped area; function with minimum maintenance; promote drainage and minimize erosion or abrasion of the cover; and accommodate settling and subsidence so that the cover's integrity is maintained. Additionally, the cap must have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present to keep water and leachate from collecting in the waste.

Groundwater detection monitoring will continue throughout closure and for the compliance period agreed upon by the FFA parties. Wells that are no longer needed for compliance monitoring must be permanently plugged and abandoned.

TSCA regulations do not specifically address capping individual cells of the chemical waste landfill; however, EPA guidance indicates that closure of a TSCA landfill should parallel closure requirements under RCRA.

7.7 POST-CLOSURE CARE

The owner of a RCRA landfill must have a post-closure plan and provide appropriate post-closure notices and surveys to the appropriate local authorities. Post-closure care must begin after closure. Under CERCLA, five-year reviews are performed where hazardous substances remain on-site, to determine if remedy protectiveness is being maintained. Reviews continue, per 40 CFR 300.430(f)(4)(ii), as long as the hazardous substances remain above levels that would allow unlimited use and unrestricted exposure.

Property use must be restricted and the facility must be maintained to protect the integrity of the landfill cover and other components. General post-closure care includes site surveillance and maintenance, maintenance and operation of the leachate collection system as long as leachate is being generated, and environmental monitoring, including groundwater detection monitoring.

7.8 ENVIRONMENTAL MONITORING DURING OPERATION, CLOSURE, AND POST-CLOSURE CARE

The owner of a RCRA landfill must conduct monitoring of leachate, surface water, and groundwater during landfill operations, closure, and the post-closure care period. RCRA and TSCA provide requirements for construction of groundwater monitoring wells, and RCRA further specifies groundwater monitoring program, sample collection, and detection monitoring requirements.

The substantive requirements of RCRA detection and compliance monitoring at 40 CFR 264, Subpart F will be carried out, as applicable, during landfill operation, closure, and post-closure. An appropriate point of compliance and compliance period will be determined after discussions with regulators and recorded in appropriate FFA documents such as the Remedial Action Work Plan. Certain Subpart F ARARs relating to monitoring will be tailored to the specific wastes accepted by EMDF; tailoring of these ARARs are discussed further below and within Table G-8. Groundwater detection monitoring is designed to detect a potential release from the landfill, and compliance monitoring is intended to be used to confirm a release and to assist with corrective actions in the event a leak is confirmed. In the event of a release, remedial actions would be planned and implemented under CERCLA, as applied by the FFA, and not RCRA.

RCRA and TSCA provide requirements for locating and constructing groundwater monitoring wells which will be met. Newly constructed monitoring wells will be developed to remove any particulate matter and to ensure adequate flow of groundwater into the borehole. RCRA specifies groundwater monitoring program requirements, sample collection, and analyses to be conducted at 40 CFR 264, Subpart F. DOE proposes to comply with substantive Subpart F requirements within the context of the CERCLA FFA process. Further, in recognition of the fact that the proposed EMDF is primarily a low-level radioactive waste landfill, DOE proposes certain modifications to Subpart F requirements that will make these requirements more suitable to a LLW landfill than a commercial hazardous waste landfill. Proposed modifications include:

- Subpart F requires that analyses conducted on groundwater during detection and compliance monitoring are to include the constituents listed in 40 CFR 264, Appendix IX. This list is relevant but not appropriate since it (a) does not address radioactivity or radionuclides (primary contaminants of concern), and (b) includes a long list of organic compounds that are prohibited from disposal by the EMDF WAC. An appropriate analyte list will be provided in a monitoring plan to be prepared and approved by the FFA parties prior to waste receipt. It is noted that a constituent list that is appropriate for the EMDF should contain some radioactive parameters

(alpha, beta) and certain radionuclides. These constituents are not subject to RCRA, but may be included as part of the expected CERCLA environmental monitoring program at the EMDF.

- The NCP (40 CFR 300.430[e][5][B] and [C]), requires that remedial actions conducted in surface or groundwater that are or may be used for drinking water must meet the Safe Drinking Water Act of 1974 (SDWA) maximum contaminant level goal, or if that is set to zero, the maximum contaminant level (MCL) will apply. However, this remedial action is not being conducted in or on surface or groundwater; therefore, the MCLs are not ARARs for this action. Tennessee classifies all groundwater as potable water, unless otherwise classified. Although EPA has not approved Tennessee's groundwater classification scheme, the SDWA limits are used as screening criteria for groundwater contaminants that may originate from the EMDF and, as such, the concentration limits set forth in 40 CFR 264.94 may change, per approval of the FFA parties and as allowed by 40 CFR 264.94(b), to the SDWA limits. Likewise, MCLs will be used as screening criteria for radionuclides in groundwater. The SDWA limits are not applicable or relevant and appropriate for surface waters, which are not classified for Domestic Water Supply. The MCLs are listed in Appendix H for informational purposes.
- Detection monitoring required by 40 CFR 264.98 will use indicator parameters and a short list of laboratory analytes to statistically determine if a release to groundwater is indicated. Detection monitoring will either follow the statistical procedures defined in the regulation, or will develop an alternative procedure for approval by the FFA parties.
- Compliance monitoring will be carried out in the event that a leak is thought to have been detected. If a leak is confirmed, compliance monitoring plans will be approved by the FFA parties. It is anticipated that compliance monitoring would incorporate certain 40 CFR 264.99 requirements.
- The corrective action requirements of 40 CFR 264.100, triggered by exceedances confirmed during compliance monitoring, will be met entirely through the CERCLA FFA process that is currently in place or as may be modified by future agreement among the FFA parties.

Reporting requirements of 40 CFR 264 Subpart F are administrative, and the FFA reporting requirements will be followed. The EMDF ROD, when approved, constitutes the necessary "permit" to operate a CERCLA landfill.

7.9 CONSTRUCTION AND OPERATION OF AN ON-SITE LANDFILL WASTEWATER TREATMENT SYSTEM

Proposed onsite alternatives in the FFS include construction and operation of a landfill wastewater treatment system (LWTS). ARARs specific to the construction and operation of an on-site LWTS are listed in Table G-10.

Although the EMWWMF and the proposed EMDF are designed to accept RCRA Subtitle C hazardous waste, no RCRA listed hazardous waste has been disposed at EMWWMF and all RCRA characteristic waste sent to the EMWWMF has been treated to meet RCRA LDRs prior to transfer. Years of leachate and contact water sampling data indicate none of the water contains RCRA characteristic waste. RCRA listed waste will be prohibited from disposal at the proposed EMDF per the ROD. Estimates of future waste streams at the EMDF, however, indicate there may be enough mercury to cause leachate or contact waters to fail TCLP for hazardous characteristics, which would cause the wastewater stream to be characteristically hazardous.

On-site wastewater treatment units that are part of a wastewater treatment facility subject to regulation under Section 402 or Section 307(b) of the Clean Water Act of 1972 (CWA) are exempt from the

requirements of RCRA Subtitle C for all tank systems, conveyance systems (whether piped or trucked), and ancillary equipment used to store or transport RCRA contaminated water so long as the definitions for “tank system” are met [40 CFR 264.1(g)(6); 40 CFR 260.10; 40 CFR 270.1(c)(2)(v); TDEC 0400-12-01-.07(1)(b)(4)(iv); 53 FR 34079, September 2, 1988]. Therefore, RCRA requirements are not legally applicable to the wastewater treatment facility(ies), including any tanks, containers, trucks, pipelines, or surface impoundments. However, because the EMWMF and the proposed EMDF are designed to meet RCRA hazardous waste facility standards and the EMDF water may be characteristically hazardous, the situation is considered sufficiently similar and “well suited” to a RCRA site to consider certain of the RCRA standards “relevant and appropriate” requirements under the CERCLA ARARs process for this action [see 40 CFR 300.430(g)(2) for a discussion of the “relevant and appropriate” analysis process]. These include the design, construction, operation, and closure/post-closure standards for tanks and surface impoundments.

Although effluent from RCRA Subtitle C hazardous waste landfills is regulated under the CWA and subject to effluent limits set under 40 CFR 445.11, CERCLA actions are exempt from the need to obtain permits (see Chapter 1 of this Appendix). Such effluent limitations would, in this case, be specified in the final decision document for this action under full oversight and approval by the regulatory authorities and as agreed to by the FFA parties, as discussed in Sect. 5.1 of this Appendix.

The surface water quality standards discussed as chemical-specific ARARs in Chapter 5 of this Appendix and listed as chemical-specific ARARs in Tables G-1 and G-2 will be implemented through the state’s action-specific effluent discharge requirements under the CWA. The state requires that point source discharges of wastewaters receive the degree of treatment or effluent reduction necessary to comply with water quality standards and, where appropriate, that such discharges comply with the “Standard of Performance” as required by TN Water Quality Control Act at TCA §§69-3-101, et seq. For industrial discharges without applicable National Pollutant Discharge Elimination System federal effluent guidelines for its particular category of industry, best professional judgment must be employed to determine appropriate effluent limitations and standards. As discussed in Section G.5.1, the specific effluent criteria and how and where they would be applied and enforced as final limits, should the selected remedy include an on-site LWTS, would be negotiated and set in the final decision document for this action and could include any subset of these criteria, as determined by the regulatory authorities.

It is possible that there may be air pollutant emissions from a constructed LWTS, although the amounts are not expected to be large enough to be considered a “major source” or to exceed emission thresholds and offset ratios allowed under CAA regulations. The National Ambient Air Quality Standards (NAAQS) are established as the criteria state and local governments must plan to achieve and thus are not directly enforceable in and of themselves. Under the CAA §110, states are required to promulgate regulations to achieve the NAAQS and these state regulations are then the potential ARARs. The CAA NESHAPs for various industrial sources that emit one of several pollutants are established in 40 CFR 61. Most of the NESHAPs are neither applicable nor relevant and appropriate to cleanup at CERCLA sites because they regulate particular types of sources that would not be expected to be found at a CERCLA site (EPA, 1989; EPA, 1990; EPA, 1992a). The 40 CFR 61.92 radionuclide NESHAP, however, is applicable to DOE facilities and is included as a chemical-specific ARAR in Table G-2. The RCRA air emission control requirements of 40 CFR 264 Subpart CC [air emission standards for tanks] do not apply to a waste management unit(s) that is used solely for on-site treatment or storage of hazardous waste that is generated as the result of implementing remedial activities required under CERCLA authorities [40 CFR 264.1080(b)(5); TDEC 0400-12-01-.32(a)(2)(v)]. On-site remediation and treatment of contaminated water using air strippers is also an exempted air contaminant source under TDEC regulations provided the emissions are no more than 5 tons per year of any regulated pollutant that is not a hazardous air pollutant and less than 1000 pounds per year of each hazardous air pollutant [TDEC 1200-03-09-.04(4)(d)(24)]. If on-site water treatment is selected as part of an alternative, the air regulations and available exemptions will be reexamined as ARARs as facility design is further developed and refined.

Per EPA regulation and guidance, reporting and recordkeeping requirements, as well as requirements related to test procedures and sampling methods are considered administrative requirements, not substantive environmental protection standards, therefore are not ARARs [40 CFR 300.5; EPA, 1992b, pg. 2; Preamble to the Final NCP, 55 *FR* 8756, March 8, 1990; EPA, 1988, pg. 1-11]. Although these requirements will be met as mandated by internal DOE and company policy and procedures, and will be completed in accordance with those procedures and CERCLA requirements and guidance and documented in project files, they are not listed as ARARs in the ARAR tables.

7.10 OFF-SITE TRANSPORTATION AND DISPOSAL

ARARs for off-site transportation and disposal of hazardous waste, mixed radioactive waste, LLW, and PCB waste are listed in Table G-11 and discussed below in Chapter 8. ARARs given for the off-site alternative apply to the on-site elements of the alternative only (e.g., those ARARs discussing placarding are provided to address the actions that are carried out at an on-site loading station).

8. OFF-SITE DISPOSAL ALTERNATIVE ACTION-SPECIFIC ARARs/TBCs

Table G-11 lists action-specific ARARs for the Off-site and Hybrid Disposal Alternatives and for off-site transportation and disposal of waste under the On-site Disposal Alternative. Prior to sending the wastes off-site, debris will be size reduced at an on-site volume reduction facility at ETTP under Option 1. Under the Hybrid Disposal Alternative debris may be size reduced as well. ARARs for a size reduction facility are discussed in Section 7.2.5 and included in Table G-11. Any wastes that are transferred off-site or transported in commerce along public rights-of-way must meet the U.S. Department of Transportation (DOT) requirements summarized in Table G-11 for hazardous materials, as well as the specific requirements for the type of waste (e.g., RCRA, TSCA, LLW, or mixed).

The DOT regulations for hazardous materials include requirements for marking labeling, placarding, and packaging. RCRA requires generators to ensure and document that the hazardous waste they generate is properly identified and transported to a treatment, storage, and disposal facility. Specific requirements are given for manifesting, packaging, labeling, marking, and placarding. In addition, there are record-keeping and reporting requirements. Pre-transport requirements reference the DOT regulations under 49 CFR 172, 173, 178, and 179.

CERCLA Section 121(d)(3) requires that permitted facilities in receipt of any hazardous substance, pollutant, or contaminant generated during CERCLA response actions be in compliance with RCRA and applicable state laws. EPA has established the procedures and criteria for determining whether facilities are acceptable for the receipt of such waste at 40 CFR 300.440. A regulatory determination pursuant to 40 CFR 300.440 will be obtained for any permitted facility to which remediation waste, including landfill wastewater, may be transferred for treatment.

Any generator who relinquishes control of PCB wastes by transporting them to an off-site disposal facility must comply with the applicable provisions of TSCA (40 CFR 761.207 et seq.). Once wastes generated from a CERCLA response action are transferred off site, all administrative as well as substantive provisions of all applicable requirements must be met.

DOE's policy is to treat, store, and in the case of LLW, dispose of waste at the site where it is generated, if practical, or at another DOE facility if on-site capabilities are not practical and cost effective. The use of non-DOE facilities for storage, treatment, and disposal of LLW may be approved by ensuring, at a minimum, that the facility complies with applicable federal, state, and local requirements and has the necessary permit(s), license(s), and approval(s) to accept the specific waste.

Table G-1. Numeric Ambient Water Quality Criteria (AWQC) that are Potential Chemical-Specific ARARs/TBCs for Key COCs in EMWMF/EMDF Landfill Wastewater^d

Chemical	Fish and Aquatic Life [TDEC 0400-40-03-.03(3)]		Recreation ^b [TDEC 0400-40-03-.03(4)]	Required reporting level ^c [TDEC 0400-40-03-.05(8)]
	Criterion maximum concentration (CMC) (µg/L or ppb)	Criterion continuous concentration (CCC) (µg/L or ppb)	Organisms only (µg/L or ppb)	(RRL) (µg/L or ppb)
Aldrin (c)	3.0		0.00050	0.5
Arsenic (c)			10.0	1.0
Arsenic (III)	340 ^d	150 ^d		1.0
b-BHC (c)			0.17	
Cadmium	2.0 ^e	0.25 ^e		1.0
Chromium (III)	570 ^e	74 ^e		1.0
Chromium (VI)	16 ^d	11 ^d		10.0
Copper	13 ^e	9.0 ^e		1.0
Cyanide	22	5.2	140	5.0
4,4'-DDT (b)(c)	1.1	0.001	0.0022	0.1
4,4'-DDE (b)(c)			0.0022	0.1
4,4'-DDD (b)(c)			0.0031	0.1
Dieldrin (b)(c)	0.24	0.056	0.00054	0.05
Lead	65 ^e	2.5 ^e		1.0
Mercury (b)	1.4 ^d	0.77 ^d	0.051	0.2
Nickel	470 ^e	52 ^e	4600	10.0

(b) = bioaccumulative parameter

(c) = carcinogenic parameter

^a <http://www.tn.gov/sos/rules/0400/0400-40/0400-40-03>

^b A 10⁻⁵ risk level is used for setting TDEC recreational criteria for all carcinogenic pollutants. Recreational criteria for noncarcinogenic chemicals are set using a 10⁻⁶ risk level. [Note: All federal recreational criteria are set at a 10⁻⁶ risk level].

^c In cases in which the in-stream AWQC or effluent limits established for an outfall are less than current chemical technological capabilities for analytical detection, compliance with the AWQC or limits will be determined using the higher RRLs, as allowed pursuant to TDEC 0400-40-03-.05(8).

^d Criteria are expressed as dissolved.

^e Criteria are expressed as dissolved and are a function of total hardness (mg/L). Criteria displayed correspond to a total hardness of 100 mg/L.

ARARs = applicable or relevant and appropriate requirements

AWQC = ambient water quality criteria

CCC = criterion continuous concentration

CMC = criterion maximum concentration

COCs = contaminants of concern

EMDF = Environmental Management Disposal Facility

EMWMF = Environmental Management Waste Management Facility

RRL = required reporting level

TBC = to-be-considered [guidance]

TDEC = Tennessee Department of Environment and Conservation

Table G-2. Chemical-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives

Media/Chemical	Requirements	Prerequisite	Citation
Radionuclide emissions	Emissions of radionuclides (other than radon) to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/year.	Radionuclide emissions from point sources at a DOE facility— applicable	40 CFR 61.92 TDEC 1200-03-11-.08(6)
	Radionuclide emission measurements shall be made at all release points which have a potential to discharge radionuclides into the air in quantities which could cause an effective dose equivalent in excess of 1 percent of the standard. All radionuclides which could contribute greater than 10 percent of the potential effective dose equivalent for a release point shall be measured.		40 CFR 61.93(b)(4)(i) TDEC 1200-03-11-.08(6)
Releases of radionuclides to the environment	Shall use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve doses to members of the public that are ALARA.	Releases of radionuclides into the environment from an active NRC licensed operation— relevant and appropriate	TDEC 0400-20-05-.40(2)
Radon releases to environment	No source at a Department of Energy facility shall emit more than 20 picocuries per square meter per second (pCi/[m ² -sec]) (1.9 pCi/[ft ² -sec]) of radon-222 as an average for the entire source, into the air. This requirement will be part of any Federal Facilities Agreement reached between Environmental Protection Agency and DOE.	Radon releases to the environment at a DOE facility— applicable	40 CFR 61.192 TDEC 1200-03-11-.17
Performance objectives for LLW disposal facility	Concentrations of radioactive material which may be released to the general environment in groundwater, surface water, air, soil, plants or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid and 25 millirems to any organ of any member of the public Reasonable effort shall be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable (ALARA).	Construction of a LLW disposal facility— relevant and appropriate	TDEC 0400-20-11-.16(2)
Instream water quality criteria for release of landfill wastewater into Bear Creek tributary	Dissolved oxygen shall not be less than 5.0 mg/l. Substantial or frequent variations in dissolved oxygen levels, including diurnal fluctuations, are undesirable if caused by man-induced conditions. Diurnal fluctuations shall not be substantially different than the fluctuations noted in reference streams in the region. There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.	Release of wastewater or effluents into surface water— applicable as instream criteria beyond the mixing zone	TDEC 0400-40-03-.03(3)(a) TDEC 0400-40-03-.03(4)(a) TDEC 0400-40-03-.03(5)(a) TDEC 0400-40-03-.03(6)(a)
	The pH value shall not fluctuate more than 1.0 unit over a period of 24 hours and shall not be outside the following ranges: 6.0-9.0.		TDEC 0400-40-03-.03(3)(b) TDEC 0400-40-03-.03(4)(b) TDEC 0400-40-03-.03(5)(b) TDEC 0400-40-03-.03(6)(b)

Table G-2. Chemical-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Media/Chemical	Requirements	Prerequisite	Citation
	The hardness of or the mineral compounds contained in the water shall not impair its use for irrigation or livestock watering and wildlife.		TDEC 0400-40-03-.03(5)(c) TDEC 0400-40-03-.03(6)(c)
	There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life or recreation or impair its use for irrigation or livestock watering and wildlife.		TDEC 0400-40-03-.03(3)(c) TDEC 0400-40-03-.03(4)(c) TDEC 0400-40-03-.03(5)(d) TDEC 0400-40-03-.03(6)(d)
	There shall be no turbidity, total suspended solids, or color in such amounts or of such character that will materially affect fish and aquatic life or result in any objectionable appearance to the water, considering the nature and location of the water.		TDEC 0400-40-03-.03(3)(d) TDEC 0400-40-03-.03(4)(d)
	The maximum water temperature shall not exceed 3 degrees C relative to an upstream control point. The temperature of the water shall not exceed 30.5 degrees C and the maximum rate of change shall be 2 degrees C per hour. There shall be no abnormal water temperature changes that may affect aquatic life unless caused by natural conditions. The temperature in flowing streams shall be measured at mid-depth. Temperature shall not interfere with its use for irrigation or livestock watering and wildlife purposes.		TDEC 0400-40-03-.03(3)(e) TDEC 0400-40-03-.03(4)(e) TDEC 0400-40-03-.03(5)(e) TDEC 0400-40-03-.03(6)(e)
	Waters shall not contain substances that will impart unpalatable flavor to fish or result in noticeable offensive odors in the vicinity of the water or otherwise interfere with fish or aquatic life.		TDEC 0400-40-03-.03(3)(f) TDEC 0400-40-03-.03(4)(g)
	Waters shall not contain substances or combination of substances including disease-causing agents which, by way of either direct exposure or indirect exposure through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), physical deformations, or restrict or impair growth in fish or aquatic life or their offspring. See Table G.1 for list of criteria for key contaminants of concern.		TDEC 0400-40-03-.03(3)(g)
	Water shall not contain toxic substances that will render the water unsafe or unsuitable for water contact activities including the capture and subsequent consumption of fish and shellfish, or will propose toxic conditions that will adversely affect man, animal, aquatic life, or wildlife. See Table G.1 for list of criteria for key contaminants of concern.		TDEC 0400-40-03-.03(4)(j)
	Water shall not contain other pollutants that will be detrimental to fish or aquatic life, or adversely affect the quality of the waters for recreation, irrigation, or livestock watering and wildlife.		TDEC 0400-40-03-.03(3)(h) TDEC 0400-40-03-.03(4)(k) TDEC 0400-40-03-.03(5)(f) and (g) TDEC 0400-40-03-.03(6)(f) and

Table G-2. Chemical-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Media/Chemical	Requirements	Prerequisite	Citation
			(g)
	Water shall not contain iron at concentrations that cause toxicity or in such amounts that interfere with habitat due to precipitation or bacteria growth.		TDEC 0400-40-03-.03(3)(i)
	The one-hour and thirty-day average concentrations of ammonia shall not exceed the acute criterion and chronic criteria calculated using the equations given in TDEC 0400-40-03-.03(3)(j).		TDEC 0400-40-03-.03(3)(j)
	Water shall not contain nutrients in concentrations that stimulate aquatic plant and/or algae growth to the extent that aquatic habitat is substantially reduced and/or biological integrity fails to meet regional goals or that the public's recreational uses of the water body or downstream waters are affected. Quality of downstream waters shall not be detrimentally affected. Interpretation of this provision may be made using the document Development of Regionally-based Interpretations of Tennessee's Narrative Nutrient Criterion and/or other scientifically defensible methods.		TDEC 0400-40-03-.03(3)(k) TDEC 0400-40-03-.03(4)(h)
	The concentration of the <i>e. coli</i> group shall not exceed 126 per 100 ml as a geometric mean based on a minimum of 5 samples collected as specified in the regulation. The concentration of <i>e. coli</i> group in any individual sample shall not exceed 1 per 100 ml.		TDEC 0400-40-03-.03(3)(l) TDEC 0400-40-03-.03(4)(f)
	Waters shall not be modified through the addition of pollutants or through physical alteration to the extent that diversity and/or productivity of aquatic biota within the receiving waters are substantially decreased or, in the case of wadeable streams, substantially different from conditions in reference streams in the same ecoregion. The parameters associated with this criterion are the aquatic biota measured. These are response variables.		TDEC 0400-40-03-.03(3)(m)
	Quality of stream habitat shall provide for development of a diverse aquatic community that meets regionally-based biological integrity goals. Types of habitat loss include channel and substrate alterations, rock and gravel removal, stream flow changes, silt accumulation, precipitation of metals, and removal of riparian vegetation. For wadeable streams, instream habitat within each sub ecoregion shall be generally similar to that found at reference streams. However, streams shall not be assessed as impacted by habitat loss if it has been demonstrated that the biological integrity goal has been met.		TDEC 0400-40-03-.03(3)(n)

Table G-2. Chemical-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Media/Chemical	Requirements	Prerequisite	Citation
	Stream flow shall support fish and aquatic life criteria and recreational use.		TDEC 0400-40-03-.03(3)(o) TDEC 0400-40-03-.03(4)(m)
Antidegradation requirements	Effluent limitations may be required to insure [sic] compliance with the Antidegradation Statement in TDEC 0400-40-03-.06.	Point source discharge(s) of pollutants into waters of the U.S. — applicable	TDEC 0400-40-05-.10(4)
	New or increased discharges that would cause measurable degradation of the parameter that is unavailable shall not be authorized. Nor will discharges be authorized if they cause additional loadings of unavailable parameters that are bioaccumulative or that have criteria below current method detection levels.	Waters with “unavailable”[as defined in TDEC 0400-40-03-.06(2)] parameters— applicable	TDEC 0400-40-03-.06(2)(a)
	No new or expanded water withdrawals that will cause additional measurable degradation of the unavailable parameter shall be authorized.		TDEC 0400-40-03-.06(2)(b)
	Where one or more of the parameters comprising the habitat criterion are unavailable, activities that cause additional degradation of the unavailable parameter or parameters above the level of de minimis shall not be authorized.		TDEC 0400-40-03-.06(2)(c)

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives

Location Resource	Requirements	Prerequisite	Citation
<i>Wetlands</i>			
Presence of wetlands as defined in 10 CFR 1022.4	Incorporate wetland protection considerations into its planning, regulatory, and decision-making processes, and, to the extent practicable, minimize the destruction, loss, or degradation of wetlands; and; preserve and enhance the natural and beneficial values of wetlands.	DOE actions that involve potential impacts to, or take place within wetlands— applicable	10 CFR 1022.3(a)(7) and (8)
	Undertake a careful evaluation of the potential effects of any proposed wetland action. Avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction of and occupancy and modification of wetlands. Avoid direct and indirect development in a wetland wherever there is a practicable alternative. Identify, evaluate, and, as appropriate, implement alternative actions that may avoid or mitigate adverse wetland impacts.		10 CFR 1022.3(b), (c), (d)
	<i>Project Description.</i> This section shall describe the proposed action and shall include a map showing its location with respect to the floodplain and/or wetland. For actions located in a floodplain, the nature and extent of the flood hazard shall be described, including the nature and extent of hazards associated with any high-hazard areas.		10 CFR 1022.13(a)(1)
	<i>Floodplain or Wetland Impacts.</i> This section shall discuss the positive and negative, direct and indirect, and long- and short-term effects of the proposed action on the floodplain and/or wetland. This section shall include impacts on the natural and beneficial floodplain and wetland values (§ 1022.4) appropriate to the location under evaluation. In addition, the effects of a proposed floodplain action on lives and property shall be evaluated. For an action proposed in a wetland, the effects on the survival, quality, and function of the wetland shall be evaluated.		10 CFR 1022.13(a)(2)
	<i>Alternatives.</i> Consider alternatives to the proposed action that avoid adverse impacts and incompatible development in a wetland area, including alternate sites, alternate actions, and no action. DOE shall evaluate measures that mitigate the adverse effects of actions in a wetland including, but not limited to, minimum grading requirements, runoff controls, design and construction constraints, and protection of ecologically-sensitive areas.		10 CFR 1022.13(a)(3)

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	If no practicable alternative to locating or conducting the action in the wetland is available, then before taking action design or modify the action in order to minimize potential harm to or within the wetland, consistent with the policies set forth in Executive Order 11990.		10 CFR 1022.14(a)
Presence of jurisdictional wetlands as defined in 40 CFR 230.3; 33 CFR 328.3(a), and 33 CFR 328.4	The discharge of dredged or fill material into waters of the United States, including jurisdictional wetlands, is prohibited if there is a practical alternative that would have less adverse impact. No discharge shall be permitted that results in violation of state water quality standards, violates any toxic effluent standard, and/or jeopardizes an endangered species or its critical habitat. No discharge will be permitted that will cause significant degradation of waters of the United States. No discharge is permitted unless mitigation measures have been taken in accordance with 40 CFR 230, Subpart H.	Actions that involve discharge of dredged or fill material into waters of United States, including jurisdictional wetlands— applicable	40 CFR 230.10(a), (b), (c) and (d) 40 CFR 230, Subpart H
Mitigation of state wetlands as defined under TDEC 0400-40-07-.03	If an applicant proposes an activity that would result in appreciable permanent loss of resource value of wetlands, the applicant must provide mitigation, which results in no overall net loss of resource value. Compensatory measures must be at a ratio of 2:1 for restoration, 4:1 for creation and enhancement, and 10:1 for preservation, or at a best professional judgment ratio agreed to by the state. For any mitigation involving the enhancement or preservation of existing wetlands, to the extent practicable, the applicant shall complete the mitigation before any impact occurs to the existing state waters. For any mitigation involving restoration or creation of a wetland, to the extent practicable, the mitigation shall occur either before or simultaneously with impacts to the existing state waters. Mitigation actions for impacts to wetlands are prioritized as listed in TDEC 0400-40-07-.04 (7)(b)(1)(i) – (viii).	Activity that would cause loss of wetlands as defined in TDEC 0400-40-07-.03— applicable	TDEC 0400-40-07-.04 (7)(b)
Presence of minor isolated wetlands of less than 0.25 acres – Minor alterations to wetlands	Authorizes minor temporary or permanent alterations of wetlands, where avoidance is not possible. Alterations of up to 0.10 acres of moderate resource value wetlands and up to 0.25 acre of wetlands that are degraded or of low functional capacity must meet certain requirements as follows: <i>Special Conditions</i> <ul style="list-style-type: none"> • Activities where all practicable measures to avoid and minimize adverse impacts to the wetlands and other waters of the state have not been employed are not covered by this permit. 	Alteration of minor isolated wetlands of less than 0.25 acres— applicable	TCA 69-3-108(1) TDEC 0400-40-07-.01 TDEC ARAP General Permit for Minor Alterations to Wetlands (effective April 7, 2015) (TBC)
	<ul style="list-style-type: none"> • Excavation and fill activities associated with the wetlands alteration shall be kept to a minimum. 		
	<ul style="list-style-type: none"> • Wetlands outside of the permitted impact areas shall be clearly marked so that all work performed is solely within the permitted impact area. 		

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	<ul style="list-style-type: none"> Authorized wetland alterations shall not cause measureable degradation to resource values and classified uses of hydrologically connected wetlands or other waters of the state, including disruption of sustaining surface or groundwater hydrology. Adjacent wetlands or streams determined likely to be measurably degraded by such hydrologic alteration, or by partial fill, must be included in the cumulative impact calculation, even if not filled or otherwise directly altered physically. 		
	<ul style="list-style-type: none"> Temporary impacts to wetlands shall be mitigated by the removal and stockpiling of the first 12 inches of topsoil, prior to construction. Upon completion of construction activities, all temporary wetland impact areas are to be restored to pre-construction contours, and the stockpiled topsoil spread to restore these areas to pre-construction elevation. Other side-cast material shall not be placed within the temporary impact locations. Permanent vegetation stabilization using native species of all disturbed areas in or near the wetland must be initiated within 14 days of project completion. Non-native non-invasive annuals may be used as cover crops until native species can be established. 		
	<p><u>General Conditions</u></p> <ul style="list-style-type: none"> Activities, either individually or cumulatively, that may result in greater than <i>de minimis</i> degradation to waters of the state are not covered. 		
	<ul style="list-style-type: none"> Clearing, grubbing, or other disturbance of areas to wetland vegetation shall be kept at a minimum. Unnecessary wetland vegetation removal, including trees, and soil disturbance is prohibited. Native wetland vegetation must be reestablished after work is completed. Coverage under this permit does not serve to waive any local wetland buffer protection requirement. 		
	<ul style="list-style-type: none"> Activity may not result in a disruption or barrier to the movement of fish or other aquatic life and wetland dependent species. 		
	<ul style="list-style-type: none"> Activities occurring in known or likely habitat of state or federally listed threatened, endangered, deemed in need of management, or species of special concern may not be authorized without prior coordination with the TWRA and TDEC Division of Natural Areas to determine if any special conditions are required to avoid and/or minimize harm to the listed species or their habitat. Adverse effects to federally listed threatened and endangered species are not permitted without prior authorization from the U.S. FWS. 		
	<ul style="list-style-type: none"> This permit does not authorize impacts to cultural, historic or archaeological features or sites. 		

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	<ul style="list-style-type: none"> This permit does not authorize access to private property. Arrangements concerning the use of private property shall be made with the landowner. 		
	<ul style="list-style-type: none"> Where practicable, all activities shall be accomplished in the dry. All surface water flowing towards this work shall be diverted using cofferdams and/or berms constructed of sandbags, clean rock (containing no fines or soils), steel sheeting, or other non-erodible, non-toxic material. All such diversion materials shall be removed upon completion of work. 		
	<ul style="list-style-type: none"> All activities must be carried out in such a manner as will prevent violations of water quality criteria as stated in TDEC Rule 0400-40-03. This includes, but is not limited to, prevention of any discharge or use of materials that may be harmful to humans, terrestrial or aquatic life, or causes a condition in which visible solids, bottom deposits or turbidity impairs the designated uses of waters of the state. 		
	<ul style="list-style-type: none"> Erosion and sediment controls must be in place and functional before any earth moving operations begin, and shall be designed according to the department's <i>Erosion and Sediment Control Handbook</i>. Permanent vegetative stabilization using native species of all disturbed areas in or near the stream channel must be initiated within 15 days of project completion. Non-native non-invasive annuals may be used as cover crops until native species can be established. 		
	<ul style="list-style-type: none"> The use of monofilament-type erosion control netting or blanket is prohibited. 		
Floodplains			
Presence of floodplain as defined in 10 CFR 1022.4	Incorporate floodplain management goals into planning, regulatory, and decision-making processes, and, to the extent practicable, reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; restore and preserve natural and beneficial values served by floodplains; require the construction of DOE structures and facilities to be, at a minimum, in accordance with FEMA National Flood Insurance Program building standards; and promote public awareness of flood hazards by providing conspicuous delineations of past and probable flood heights on DOE property that is in an identified floodplain.	DOE actions that involve potential impacts to, or take place within, floodplains— applicable	10 CFR 1022.3(a)(1) through (6)
	Undertake a careful evaluation of the potential effects of any proposed floodplain action. Identify, evaluate, and, as appropriate, implement alternative actions that may avoid or mitigate adverse floodplain impacts.		10 CFR 1022.3(b) and (d)

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	Avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. Avoid direct and indirect development in a floodplain wherever there is a practicable alternative.		10 CFR 1022.3(c)
	Consider alternatives to the proposed action that avoid adverse impacts and incompatible development in the floodplain, including alternate sites, alternate actions, and no action. DOE shall evaluate measures that mitigate the adverse effects of actions in a floodplain including, but not limited to, minimum grading requirements, runoff controls, design and construction constraints, and protection of ecologically-sensitive areas.		10 CFR 1022.13(a)(3)
	If no practicable alternative to locating or conducting the action in the floodplain is available, then before taking action design or modify the action in order to minimize potential harm to or within the floodplain, consistent with the policies set forth in Executive Order 11988.		10 CFR 1022.14(a)
<i>Aquatic Resources</i>			
Within an area potentially impacting "waters of the State" as defined in TCA 69-3-103(42)	<ul style="list-style-type: none"> • Must comply with the [substantive] requirements of the ARAP for erosion and sediment control to prevent pollution of waters of the state. Pollution control requirements are detailed in each particular General Permit. 	Action potentially altering the properties of any "waters of the State"— applicable	TCA 69-3-108(1) TDEC 0400-40-07-.01
Waters of the state as defined in TCA 69-3-103(42) – Bank stabilization	<p>Bank stabilization activities along state waters must be conducted in accordance with the requirements of the ARAP Program (Rules of the TDEC, Chap. 0400-40-07). The general permit requirements for stream bank stabilization include the following:</p> <p><i>Special Conditions</i></p> <ol style="list-style-type: none"> 1. Hand armoring bank stabilization treatment is limited to 300 linear ft. for the treatment of one bank and 200 linear ft. if treatment includes both banks. <ul style="list-style-type: none"> • Use of grout, concrete or other barrier that prevents the establishment of rooted vegetation may be authorized on a limited basis. These treatments may only be permitted in areas where critical public infrastructure would prohibit other, less severe treatments from use. 	Bank-stabilization activities affecting waters of the state— applicable	TCA 69-3-108(1) TDEC 0400-40-07-.01 TDEC ARAP General Permit for Bank Stabilization Activities (effective July 23, 2015) (TBC)

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	<p>2. Soil bioengineering techniques used to stabilize streambanks are limited to 1000 linear ft.</p> <ul style="list-style-type: none"> • Hard armoring used in conjunction with these techniques is subject to the same limitations described in Special Condition #1 above. • Stone toe protection in connection with, and directly below, soil bioengineering treatment is allowable, but must be limited to the minimum height necessary to stabilize the immediate bed-bank interface. It may not exceed 1/5 the bank height or one row of “class c” rock, whichever is greater. 		
	<p>3. Instream structures may be used in conjunction with bank treatments, subject to the same limitations on streambank hard armoring and total project lengths. These structures may include rock vanes, weirs, jetties, wing deflectors, or similar techniques, subject to the following conditions:</p> <ul style="list-style-type: none"> • Placement of liners, matting or hard armor in other locations along the stream bottom is not covered. • Projects must be limited to a maximum of five instream structures. • Structures keyed into both banks that span the channel may not impede the movement of fish and aquatic life. • Instream structures keyed into one bank must not extend past 1/3 the width of the stream channel. • Use of instream structures in any waterway which is identified by TDEC as having contaminated sediments, and the activity will likely mobilize the contaminated sediments are not covered. 		
	<p>4. Work performed by vehicles and other related heavy equipment may not be staged within the stream channel.</p>		
	<p>5. Work performed by hand and related hand-operated equipment may not be staged within the stream channel.</p>		
	<p>6. Permit does not authorize projects for which the primary purpose is stream relocation, compensatory mitigation, flood control or drainage improvement.</p>		
	<p><u>General Conditions</u></p> <ul style="list-style-type: none"> • Activities, either individually or cumulatively, that may result in greater than <i>de minimis</i> degradation to waters of the state are not covered. 		

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	<ul style="list-style-type: none"> Clearing, grubbing, or other disturbance to riparian vegetation shall be kept at the minimum necessary for slope construction and equipment operations. Unnecessary riparian vegetation removal, including trees, is prohibited. Native riparian vegetation must be reestablished after work is completed. Coverage under this permit does not serve to waive any local riparian buffer protection requirement. 		
	<ul style="list-style-type: none"> Activity may not result in the permanent disruption to the movement of fish or other aquatic life upon project completion. 		
	<ul style="list-style-type: none"> Activities that directly impact wetlands, or impair surface water flow into or out of any wetland areas are not covered. 		
	<ul style="list-style-type: none"> Activities occurring in known or likely habitat of state or federally listed threatened, endangered, deemed in need of management, or species of special concern may not be authorized without prior coordination with the TWRA and TDEC Division of Natural Areas to determine if any special conditions are required to avoid and/or minimize harm to the listed species or their habitat. Adverse effects to federally listed threatened and endangered species are not permitted without prior authorization from the U.S. FWS. 		
	<ul style="list-style-type: none"> Backfill activities must be accomplished in a manner that stabilizes the streambed and banks to prevent erosion. The completed activities may not disrupt or impound stream flow. 		
	<ul style="list-style-type: none"> The use of monofilament-type erosion control netting or blanket is prohibited in the stream channel and along the riparian corridor. 		
	<ul style="list-style-type: none"> This permit does not authorize impacts to cultural, historic or archaeological features or sites. 		
	<ul style="list-style-type: none"> This permit does not authorize access to private property. Arrangements concerning the use of private property shall be made with the landowner. 		
	<ul style="list-style-type: none"> Where practicable, all activities shall be accomplished in the dry. All surface water flowing towards this work shall be diverted using cofferdams and/or berms constructed of sandbags, clean rock (containing no fines or soils), steel sheeting, or other non-erodible, non-toxic material. All such diversion materials shall be removed upon completion of work. Activities may be conducted in the flowing water if working in the dry will likely cause additional degradation. If work is conducted in the flowing water, it must be of short duration and with minimal impact. 		
	<ul style="list-style-type: none"> All activities must be carried out in such a manner as will prevent violations of water quality criteria as stated in TDEC Rule 0400-40-03. This includes, but is not limited to, prevention of any discharge or use of materials that 		

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	<p>may be harmful to humans, terrestrial or aquatic life, or causes a condition in which visible solids, bottom deposits or turbidity impairs the designated uses of waters of the state.</p>		
	<ul style="list-style-type: none"> Erosion and sediment controls must be in place and functional before any earth moving operations begin, and shall be designed according to the department’s <i>Erosion and Sediment Control Handbook</i>. Permanent vegetative stabilization using native species of all disturbed areas in or near the stream channel must be initiated within 15 days of project completion. Non-native non-invasive annuals may be used as cover crops until native species can be established. 		
	<ul style="list-style-type: none"> Temporary stream crossings shall be limited to one point in the construction area and erosion control measures shall be utilized where stream bank vegetation is disturbed. Stream beds shall not be used as linear transportation routes for construction equipment, rather, the stream channel may be crossed perpendicularly with equipment provided no additional fill or excavation is necessary. 		
<p>Waters of the state as defined in TCA 69-3-103(33) – Culvert maintenance activities</p>	<p>The maintenance of existing, currently serviceable structures or fills, such as dams, intake and outfall structures, utilities, culverts, and bridges in waters of the state must be conducted in accordance with the requirements of the ARAP Program (Rules of the TDEC, Chap. 0400-40-07). “Currently serviceable” means not so degraded as to essentially require reconstruction. In addition, this permit also authorizes:</p> <ul style="list-style-type: none"> Replacement of pipes and culverts where they are no longer currently serviceable. Excavation of accumulated sediments and debris obstructing or impeding the function of existing structures, for a cumulative maximum of 100 linear ft. above and/or below the structure. Placement of clean rock fill material within 25 ft. upstream and 25 ft. downstream of existing structures, where the erosive action of flowing water has undermined structural integrity. Minor deviations in the structure’s configuration or filled area including those due to changes in materials, construction techniques, current construction codes or safety standards which are required as part of repair or rehabilitation. 	<p>Maintenance activities affecting waters of the state—applicable</p>	<p>TCA 69-3-108(l) TDEC 0400-40-07-.01 TDEC ARAP General Permit for Maintenance Activities (effective April 7, 2015) (TBC)</p>
	<p><u>Special Conditions</u></p> <ul style="list-style-type: none"> The length of the pipe or culvert structure may not be increased. 		

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	<ul style="list-style-type: none"> The capacity or diameter of the pipe or culvert may be increased during replacement, providing it does not result in channel widening or other channel destabilization. 		
	<ul style="list-style-type: none"> Increasing dam height, resulting in increased impoundment footprint or change in downstream water quality is not covered. 		
	<ul style="list-style-type: none"> Dewatering of impoundments to conduct dam maintenance must be performed in a controlled manner designed to minimize the release of accumulated sediments into downstream waters. 		
	<p><u>General Conditions</u></p> <ul style="list-style-type: none"> Activities, either individually or cumulatively, that may result in greater than <i>de minimis</i> degradation to waters of the state are not covered. 		
	<ul style="list-style-type: none"> Clearing, grubbing, or other disturbance to riparian vegetation shall be kept at the minimum necessary for slope construction and equipment operations. Unnecessary riparian vegetation removal, including trees, is prohibited. Native riparian vegetation must be reestablished after work is completed. Non-native, non-invasive annuals may be used as cover crops until native species are established. Coverage under this permit does not serve to waive any local riparian buffer protection requirement. 		
	<ul style="list-style-type: none"> Widening of the stream channel as a result of this activity is prohibited. 		
	<ul style="list-style-type: none"> Activity may not result in the permanent disruption to the movement of fish or other aquatic life. 		
	<ul style="list-style-type: none"> Activities that directly impact wetlands, or impair surface water flow into or out of any wetland areas are not covered. 		
	<ul style="list-style-type: none"> Activities occurring in known or likely habitat of state or federally listed threatened, endangered, deemed in need of management, or species of special concern may not be authorized without prior coordination with the TWRA and TDEC Division of Natural Areas to determine if any special conditions are required to avoid and/or minimize harm to the listed species or their habitat. Adverse effects to federally listed threatened and endangered species are not permitted without prior authorization from the U.S. FWS. 		
	<ul style="list-style-type: none"> Backfill activities must be accomplished in a manner that stabilizes the streambed and banks to prevent erosion. All contours must be returned to pre-project conditions to the extent practicable and the completed activities may not disrupt or impound stream flow. 		

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	<ul style="list-style-type: none"> The use of monofilament-type erosion control netting or blanket is prohibited. 		
	<ul style="list-style-type: none"> This permit does not authorize impacts to cultural, historic or archaeological features or sites. 		
	<ul style="list-style-type: none"> This permit does not authorize access to private property. Arrangements concerning the use of private property shall be made with the landowner. Maintenance activities also require approval from any easement holders. 		
	<ul style="list-style-type: none"> Where practicable, all activities shall be accomplished in the dry. All surface water flowing towards this work shall be diverted using cofferdams and/or berms constructed of sandbags, clean rock (containing no fines or soils), steel sheeting, or other non-erodible, non-toxic material. All such diversion materials shall be removed upon completion of work. 		
	<ul style="list-style-type: none"> All activities must be carried out in such a manner as will prevent violations of water quality criteria as stated in TDEC Rule 0400-40-03. This includes, but is not limited to, prevention of any discharge or use of materials that may be harmful to humans, terrestrial or aquatic life, or causes a condition in which visible solids, bottom deposits or turbidity impairs the designated uses of waters of the state. 		
	<ul style="list-style-type: none"> Erosion and sediment controls must be in place and functional before any earth moving operations begin, and shall be designed according to the department's <i>Erosion and Sediment Control Handbook</i>. Permanent vegetative stabilization using native species of all disturbed areas in or near the stream channel must be initiated within 15 days of project completion. Non-native non-invasive annuals may be used as cover crops until native species can be established. 		
	<ul style="list-style-type: none"> Stream beds shall not be used as linear transportation routes for construction equipment. Temporary stream crossings shall be limited to one point in the construction area and erosion control measures shall be utilized where streambank vegetation is disturbed. The crossing area shall be constructed so that stream or wetland flow is not obstructed. Following construction, all materials used for the temporary crossing shall be removed and disturbed streambanks shall be restored and stabilized if needed. 		
	<ul style="list-style-type: none"> Maintenance activities related to the excavation of accumulated sediments and debris obstructing or impeding the function of an existing structure, for a cumulative maximum of 100 linear ft. immediately above and/or below the structure, and/or the placement of clean rock fill material within 25 ft. upstream and 25 ft. downstream of existing structures may be done without authorization from TDEC prior to the commencement of work provided the 		

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	work is performed in accordance with these permit terms and conditions.		
Waters of the state as defined in TCA 69-3-103 (42) – Wet weather conveyances	<p>Wet weather conveyance activities conducted in accordance with the following conditions are considered de minimis:</p> <p><u>General Conditions</u></p> <ul style="list-style-type: none"> • The activity may not result in the discharge of waste or other substances that may be harmful to humans or wildlife. • Material may not be placed in a location or manner so as to impair surface water flow into or out of any wetland area. 	Activities that alter wet-weather conveyances— applicable	TDEC 0400-40-07-.04(10)(a) TDEC ARAP General Permit for Alteration of Wet Weather Conveyances (effective April 7, 2015) (TBC)
	<ul style="list-style-type: none"> • Sediment shall be prevented from entering other waters of the state. • Erosion/sediment controls shall be designed according to size and slope of disturbed or drainage areas to detain runoff and trap sediment and shall be properly selected, installed, and maintained in accordance with manufacturer’s specifications and good engineering practices. 		
	<ul style="list-style-type: none"> • Erosion and sediment control measures must be in place and functional before earthmoving operations begin, and must be constructed and maintained throughout the construction period. Temporary measures may be removed at the beginning of the work day, but shall be replaced at the end of the work day. 		
	<ul style="list-style-type: none"> • Check dams must be utilized where runoff is concentrated. Clean rock, log, or sandbag check dams shall be properly constructed to detain runoff and trap sediment. Check dams or other erosion control devices are not to be constructed in jurisdictional streams. Clean rock can be of various type and size depending on the application and must not contain fines, soils or other wastes or contaminants. 		
	<ul style="list-style-type: none"> • Appropriate steps must be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the state. All spills must be reported to the appropriate emergency management agency and TDEC. In the event of a spill, measures shall be taken immediately to prevent pollution of waters of the state, including groundwater. 		
	<ul style="list-style-type: none"> • This permit does not authorize impacts to cultural, historic or archaeological features or sites. 		
	<ul style="list-style-type: none"> • This permit does not authorize access to private property. Arrangements concerning the use of private property shall be made with the landowner. 		

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	<ul style="list-style-type: none"> This permit does not authorize adverse impact to formally listed state or federal threatened or endangered species or their critical habitat. 		
Within area impacting stream or any other body of water - <i>and</i> - presence of wildlife resources (e.g., fish)	The effects of water-related projects on fish and wildlife resources and their habitat should be considered with a view to the conservation of fish and wildlife resources by preventing loss of and damage to such resources.	Action that impounds, modifies, diverts, or controls waters, including navigation and drainage activities— relevant and appropriate	Fish and Wildlife Coordination Act (16 <i>USC</i> 662(a))
Location encompassing aquatic ecosystem as defined as 40 CFR 230.3(c)	The discharge of dredged or fill material into waters of the United States is prohibited if there is a practical alternative that would have less adverse impact. No discharge shall be permitted that results in violation of state water quality standards, violates any toxic effluent standard, and/or jeopardizes an endangered species or its critical habitat. No discharge will be permitted that will cause significant degradation of waters of the United States. No discharge of dredged or fill material shall be permitted unless appropriate and practicable steps in accordance with 40 CFR 230.70 et seq. are taken that will minimize potential adverse impacts of the discharge on the aquatic ecosystem.	Action that involves the discharge of dredged or fill material into "waters of the U.S.", including jurisdictional wetlands— applicable	40 CFR 230.10(a), (b), (c) and (d) 40 CFR 230, Subpart H
Mitigation of state waters other than wetlands	Must provide mitigation that results in no overall net loss of resource values for any activity that would result in appreciable permanent loss of resource value of a state water. For any mitigation involving relocation or re-creation of a stream segment, to extent practicable must complete mitigation before any impact occurs to existing state waters. Mitigation measures include but are not limited to: restoration of degraded stream reaches and/or riparian zones; new (relocated) stream channels; removal of pollutants from and hydrologic buffering of stormwater runoff; and other measures which have a reasonable likelihood of increasing the resource value of a state water. Mitigation measures or actions should be prioritized in the following order: restoration, enhancement, re-creation, and protection.	Activity that would result in an appreciable permanent loss of resource value of a state water— applicable	TDEC 0400-40-07-.04(7)(a)
Cultural Resources			
Presence of historical resources on public land	Federal agencies must take into account the effects of their undertakings on historic properties.	Federal agency undertaking that may impact historical properties listed or eligible for inclusion on the National Register of Historic Places— applicable	36 CFR 800.1(a)
	Determine whether the proposed Federal action is an undertaking as defined in § 800.16(y) and, if so, whether it is a type of activity that has the potential to cause effects on historic properties.		36 CFR 800.3(a)
	Determine and document the area of potential effects, as defined in §800.16(d). Review existing information on historic properties within the area of potential effects, including any data concerning possible historic properties not yet identified.		36 CFR 800.4(a)(1) – (2)

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	Take the steps necessary to identify historic properties within the area of potential effects.		36 CFR 800.4(b)
	Apply the National Register criteria (36 CFR 63) to properties identified within the area of potential effects that have not been previously evaluated for National Register eligibility. If the agency official determines any of the National Register criteria are met and the SHPO/THPO agrees, the property shall be considered eligible for the National Register for section 106 purposes.		36 CFR 800.4(c)(1) – (2)
	Shall apply the criteria of adverse effect to historic properties within the area of potential effects.		36 CFR 800.5(a)
	Shall ensure that a determination, finding, or agreement under the procedures in this subpart is supported by sufficient documentation to enable any reviewing parties to understand its basis.		36 CFR 800.11(a)
Presence of archaeological resources on public land	No person may excavate, remove, damage, or otherwise alter or deface, or attempt to excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands or Indian lands unless such activity is pursuant to a permit issued under §7.8 or exempted by §7.5(b) of this part.	Action that would cause the irreparable loss or destruction of significant historic or archaeological resources or data on public land— applicable	43 CFR 7.4(a)
Presence of human remains, funerary objects, sacred objects, or objects of cultural patrimony	Intentional excavation of human remains, funerary objects, sacred objects, or objects of cultural patrimony from Federal or tribal lands may be conducted only if: <ul style="list-style-type: none"> • The objects are excavated or removed following the requirements of the Archaeological Resources Protection Act (ARPA) (16 USC 470aa et seq.) and its implementing regulations and • The disposition of the objects is consistent with their custody as described in §10.6. 	Action involving alteration of terrain that might cause irreparable loss or destruction of any discovered significant scientific, prehistoric, historic, or archaeological resources— applicable	43 CFR 10.3(b)(1) and (3)
	Must take reasonable steps to determine whether a planned activity may result in the excavation of human remains, funerary objects, sacred objects, or objects of cultural patrimony from Federal lands.		43 CFR 10.3(c)
	If inadvertent discovery occurred in connection with an on-going activity on Federal or tribal lands, in addition to providing the notice described above, must stop activities in the area of the inadvertent discovery and make a reasonable effort to protect the human remains, funerary objects, sacred objects, or objects of cultural patrimony discovered inadvertently.	Excavation activities that inadvertently discover such resources on federal lands or under federal control— applicable	43 CFR 10.4(c)

Table G-3. Location-specific ARARs and TBC Guidance for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Location Resource	Requirements	Prerequisite	Citation
	Must take immediate steps, if necessary, to further secure and protect inadvertently discovered human remains, funerary objects, sacred objects, or objects of cultural patrimony, including, as appropriate, stabilization or covering.		43 CFR 10.4(d)(ii)
Presence of a cemetery	Intentional desecration of a place of burial without legal privilege or authority to do so is prohibited.	Action that would alter or destroy property in a cemetery— applicable	TCA 39-17-311(a)(1)
	Disinterment of a corpse that has been buried or otherwise interred, without legal privilege or authority to do so, is prohibited.		TCA 39-17-312(a)(2)
<i>Endangered, Threatened or Rare Species</i>			
Presence of Tennessee nongame species as defined in TCA 70-8-103 and listed in TWRA Proclamations 00-14 and 00-15	May not take (i.e., harass, hunt, capture, kill or attempt to kill), possess, transport, export, or process wildlife species. May not knowingly destroy the habitat of such species. Certain exceptions may be allowed for reasons such as education, science, etc., or where necessary to alleviate property damage or protect human health or safety. Upon good cause shown and where necessary to protect human health or safety, endangered or threatened species or “in need of management” species may be removed, captured, or destroyed.	Action impacting Tennessee nongame species, including wildlife species which are "in need of management" (as listed in TWRA Proclamations 00-14 and 00-15 as amended by 00-21) — applicable	TCA 70-8-104(b) and (c) TCA 70-8-106(e) TWRA Proclamations 00-14, Section II and 00-15, Section II, as amended by Proclamation 00-21 (TBC) See also the TN Natural Heritage Program Rare Animal List (2009)
Presence of Tennessee-listed endangered or rare plant species as listed in TDEC 0400-06-02-.04	May not knowingly uproot, dig, take, remove, damage or destroy, possess or otherwise disturb for any purposes any endangered species.	Action impacting rare plant species including but not limited to federally listed endangered species— relevant and appropriate	TCA 70-8-309(a) 16 USC 1531 et seq. TDEC 0400-06-02-.04 and Tennessee Natural Heritage Program Rare Plant List (2012)
Presence of federally endangered or threatened species, as designated in 50 CFR 17.11 and 17.12 or critical habitat of such species	Actions that jeopardize the existence of a listed species or results in the destruction or adverse modification of critical habitat must be avoided or reasonable and prudent mitigation measures taken.	Action that is likely to jeopardize fish, wildlife, or plant species or destroy or adversely modify critical habitat— applicable	16 U.S.C. 1531 et seq., Sect. 7(a)(2)
Presence of migratory birds as defined in 50 CFR 10.13, and their habitats	Unlawful killing, possession, and sale of migratory bird species, as defined in 50 CFR 10.13, native to the U.S. or its territories is prohibited.	Action that is likely to impact migratory birds— applicable	16 USC 703-704
	Requirements are as follows: <ul style="list-style-type: none"> • avoid or minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency action; • restore and enhance the habitats of migratory birds, as practicable; and • prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable. 	Federal agency action that is likely to impact migratory birds— TBC	Executive Order 13186

Table G-4. Action-specific ARARs and TBC Guidance (Siting Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives

Action	Requirements	Prerequisite	Citation
Siting of a RCRA landfill	A new facility where treatment, storage, or disposal of hazardous waste will be conducted must not be located within 200 ft of a fault which has had displacement in Holocene time.	Construction of a RCRA hazardous waste landfill— applicable	40 CFR 264.18(a)(1)
	A facility located in a 100 year floodplain (as defined in 40 CFR 264.18[b][2]) must be designed, constructed, operated and maintained to prevent washout of any hazardous waste, unless it can be demonstrated that procedures are in effect which will cause the waste to be removed safely, before flood waters can reach the facility.		40 CFR 264.18(b)(1) TDEC 0400-12-01-.06(2)(i)
Siting of new commercial hazardous waste management facility	New land based units are prohibited if they cannot demonstrate the technical practicability of a corrective action program at the site, based on the availability of current or new and innovative technologies that could practicably achieve groundwater remediation. The demonstration shall specify how a corrective action response will be effectively implemented to remediate a release to groundwater within the facility property boundary and shall illustrate all the factors that are necessary to be in compliance with Rule 0400-12-01-.06(6)	Construction of a new commercial hazardous waste management facility – relevant and appropriate	TDEC 0400-12-02-.03(2)(e)(1)(i)(III)
Siting requirements for a TSCA Landfill	<p>Shall be located in thick, relatively impermeable formations such as large area clay pans. Where this is not possible, the soil shall have a high clay and silt content with the following parameters:</p> <ul style="list-style-type: none"> (i) In place soil thickness, 4-ft or compacted soil liner thickness, 3 ft; (ii) Permeability (cm/sec), equal to or less than 1×10^{-7}; (iii) Percent soil passing No. 200 Sieve, >30; (iv) Liquid Limit, >30; and (v) Plasticity Index > 15. 	Construction of a TSCA landfill— applicable	40 CFR 761.75(b)(1)
	<p>The landfill must be located above the historical high groundwater table. Floodplains, shorelands and groundwater recharge areas shall be avoided. The site shall have monitoring wells and leachate collection. There shall be no hydraulic connection between the site and standing or flowing surface water.</p> <p><i>[Note: A waiver under TSCA 40 CFR 761.75(c)(4) will be requested for this requirement.]</i></p> <p>The bottom of the landfill liner system or natural in-place soil barrier shall be at least 50 ft from the historical high water table.</p> <p><i>[Note: A waiver under TSCA 40 CFR 761.75(c)(4) will be requested for this requirement.]</i></p>	Construction of a TSCA chemical waste landfill— applicable	40 CFR 761.75(b)(3)

Table G-4. Action-specific ARARs and TBC Guidance (Siting Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p>The landfill site shall be located in an area of low to moderate relief to minimize erosion and to help prevent landslides or slumping.</p> <p><i>[Note: A waiver under TSCA 40 CFR 761.75(c)(4) will be requested for this requirement.]</i></p>		40 CFR 761.75(b)(5)
Waiver of a TSCA chemical waste landfill technical requirement	<p>An owner or operator of a chemical waste landfill may submit evidence to the Regional Administrator that operation of the landfill not present an unreasonable risk of injury to health or the environment from PCBs when one or more of the requirements of paragraph (b) of this section are not met. On the basis of such evidence and any other available information, the Regional Administrator may in his discretion find that one or more of the requirements of paragraph (b) of this section is not necessary to protect against such a risk and may waive the requirements in any approval for that landfill.</p> <p><i>Note: Waiver of any technical requirement shall be made as part of the CERCLA Record of Decision process. The CERCLA remedy protectiveness standard will apply in addition to the TSCA standard.</i></p>		40 CFR 761.75(c)(4)
Siting requirements and performance objectives for LLW disposal facility	<p>Land disposal facilities must be sited, designed, operated, closed and controlled after closure so that reasonable assurance exists that exposures to humans are within the limits established in the performance objectives.</p> <p><i>[Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).]</i></p>	Construction of a LLW disposal facility— relevant and appropriate	TDEC 0400-20-11-.16(1)
	<p>Stability of the site after closure. The disposal facility must be sited, designed, used, operated and closed to achieve long-term stability of the disposal site and to eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure so that only surveillance, monitoring or minor custodial care are required.</p>		TDEC 0400-20-11-.16(5)
	<p>Disposal site shall be capable of being characterized, modeled, analyzed and monitored.</p>		TDEC 0400-20-11-.17(1)(b)
	<p>Within the region where the facility is to be located, a disposal site should be selected so that projected population growth and future developments are not likely to affect the ability of the disposal facility to meet performance objectives.</p> <p><i>[Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).]</i></p>		TDEC 0400-20-11-.17(1)(c)
	<p>Areas must be avoided having known natural resources which, if exploited, would result in failure of the cell to meet performance objectives.</p> <p><i>[Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).]</i></p>		TDEC 0400-20-11-.17(1)(d)
	<p>Disposal site must be generally well drained and free of areas of flooding and frequent</p>		TDEC 0400-20-11-.17(1)(e)

Table G-4. Action-specific ARARs and TBC Guidance (Siting Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	ponding, and waste disposal shall not take place in a 100- year floodplain or wetland.		
	Upstream drainage area must be minimized to decrease the amount of runoff which could erode or inundate the disposal unit.		TDEC 0400-20-11-.17(1)(f)
	<p>The disposal site must provide sufficient depth to the water table that groundwater intrusion, perennial or otherwise, into the waste will not occur.</p> <p>If it can be conclusively shown that disposal site characteristics will result in molecular diffusion being the predominant means of radionuclide movement and the rate of movement will result in the performance objectives of Rules of the TDEC 0400-20-11-.16 being met, wastes may be disposed below the water table. In no case will waste disposal be permitted in the zone of fluctuation of the water table.</p> <p><i>[Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).]</i></p>		TDEC 0400-20-11-.17(1)(g)
	<p>The hydrogeologic unit used for disposal shall not discharge groundwater to the surface within the disposal site.</p> <p><i>Note: An exception, variance or exemption to this requirement will be requested under TDEC 0400-20-04-.08.</i></p>		TDEC 0400-20-11-.17(1)(h)
Exemption of TDEC 0400-20-11-17(h) requirement	<p>The Department may, upon application by any person or upon its own initiative, grant exemptions, variance, or exceptions from the requirements of these regulations which are not prohibited by statute and which will not result in undue hazard to public health and safety or property.</p> <p><i>Note: The exemption, variance or exception from the requirement shall be made as part of the CERCLA Record of Decision process. The CERCLA remedy protectiveness standard will apply in addition to the DRH standard.</i></p>		TDEC 0400-20-04-.08
	<p>Areas must be avoided where tectonic processes such as faulting, folding, seismic activity may occur with such frequency to affect the ability of the site to meet the performance objectives.</p> <p><i>[Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).]</i></p>		TDEC 0400-20-11-.17(1)(i)
	<p>Areas must be avoided where surface geologic processes such as mass wasting, erosion, slumping, landsliding or weathering may occur with such frequency and extent to affect the ability of the disposal site to meet performance objectives or preclude defensible modeling and prediction of long-term impacts.</p> <p><i>[Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).]</i></p>		TDEC 0400-20-11-.17(1)(j)

Table G-4. Action-specific ARARs and TBC Guidance (Siting Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p>The disposal site must not be located where nearby activities or facilities could impact the site's ability to meet performance objectives or mask environmental monitoring.</p> <p><i>[Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).]</i></p>		TDEC 0400-20-11-.17(1)(k)

Table G-5. Action-specific ARARs and TBC Guidance (Design Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives

Action	Requirements	Prerequisite	Citation
<i>General Landfill Design</i>			
Preparedness and prevention	Facilities must be designed, constructed, maintained, and operated to prevent any unplanned release of hazardous waste or hazardous waste constituents into the environment and minimize the possibility of fire or explosion. All facilities must be equipped with communication and fire suppression equipment and undertake additional measures as specified in 40 CFR 264.30 <i>et seq.</i>	Operation of a RCRA hazardous waste facility— applicable	40 CFR 264.30-264.37 TDEC 0400-12-01-.06(3)
Site design for a LLW disposal facility	Site design features must be directed toward long-term isolation and avoidance of the need for continuing active maintenance after site closure.	Design of a LLW disposal facility— relevant and appropriate	TDEC 0400-20-11-.17(2)(a)
	Disposal site design and operation must be compatible with the disposal site closure and stabilization plan and lead to disposal site closure that provides assurance that the performance objectives will be met. <i>[Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).]</i>		TDEC 0400-20-11-.17(2)(b)
	Disposal site must be designed to complement and improve, where appropriate, the ability of the disposal site’s natural characteristics to assure that the performance objectives will be met. <i>[Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).]</i>		TDEC 0400-20-11-.17(2)(c)
	Covers must be designed to minimize to the extent practicable water infiltration, to direct percolating or surface water away from the disposed waste and to resist degradation by surface geologic processes and biotic activity.		TDEC 0400-20-11-.17(2)(d)
	Surface features must direct surface water drainage away from disposal units at velocities and gradients which will not result in erosion that will require ongoing active maintenance in the future.		TDEC 0400-20-11-.17(2)(e)
	Disposal site must be designed to minimize to the extent practicable the contact of water with waste during storage, the contact of standing water with waste during disposal and the contact of percolating or standing water with wastes after disposal.		TDEC 0400-20-11-.17(2)(f)
	A buffer zone of land must be maintained between any disposal unit and the disposal boundary and beneath the disposed waste. The buffer zone shall be of adequate dimensions to carry out environmental monitoring activities specified in paragraph (4) of this rule and take mitigative measures if needed.		TDEC 0400-20-11-.17(3)(h)

Table G-5. Action-specific ARARs and TBC Guidance (Design Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
<i>Landfill Liner System</i>			
Liner design requirements for a TSCA landfill	Synthetic membrane liners shall be used when the hydrologic or geologic conditions at the landfill require such in order to achieve the permeability equivalent to the soils in paragraph (b)(1) of this section. Whenever a synthetic liner is used at a landfill site, special precautions shall be taken to insure that its integrity is maintained and that it is chemically compatible with PCBs. Adequate soil underlining and cover shall be provided to prevent excessive stress or rupture of the liner. The liner must have a minimum thickness of 30 mils.	Design of a TSCA chemical waste landfill— applicable	40 CFR 761.75(b)(2)
Liner and leachate collection design for a RCRA landfill	The owner or operator of a landfill unit on which construction commences after January 29, 1992 must install two or more liners and a leachate collection and removal system above and between such liners.	Design of a RCRA landfill— applicable	40 CFR 264.301(c) TDEC 0400-12-01-.06(14)(b)(3)
Liner system for RCRA landfill	<p>(i) The liner system must include:</p> <p>A. A top liner, designed and constructed of materials (e.g., geomembrane) to prevent the migration of hazardous constituents into the liner during active life and the post closure period; and</p> <p>B. A composite bottom liner, consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.</p> <p>(ii) Liners must comply with paragraphs (a)(1)(i), (ii), and (iii) of this section.</p>		40 CFR 264.301(c)(1) TDEC 0400-12-01-.06(14)(b)(3)(i)(l)

Table G-5. Action-specific ARARs and TBC Guidance (Design Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
Liner for a RCRA landfill	<p>A liner that is designed, constructed, and installed to prevent any migration of wastes out of the landfill to the adjacent subsurface soil or groundwater or surface water at any time during the active life (including the closure period) of the landfill. The liner must be constructed of materials that prevent wastes from passing into the liner during the active life of the facility. The liner must be:</p> <ul style="list-style-type: none"> (i) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients, physical contact with the waste or leachate to which they are exposed, climatic conditions, or stress from installation or daily operation; (ii) Placed on a foundation or base capable of supporting the liner and resistance to the pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression or uplift; and (iii) Installed to cover all surrounding earth likely to be in contact with waste or leachate. 		40 CFR 264.301(a)(1) TDEC 0400-12-01-.06(14)(b)1(i)
Facility design, construction	<p>Underlying the liners shall be a geologic buffer which shall have:</p> <ul style="list-style-type: none"> (i) A maximum hydraulic conductivity of 1.0×10^{-5} cm/s and measures at least ten (10) feet from the bottom of the liner to the seasonal high water table of the uppermost unconfined aquifer or top of the formation of a confined aquifer, or (ii) Have a maximum hydraulic conductivity of 1.0×10^{-6} cm/s and measure not less than five (5) feet from the bottom of liner to the seasonal high water table of the uppermost unconfined aquifer or the top of the formation of a confined aquifer, or (iii) Other equivalent or superior protection as defined in subpart (ii) of this part. 	Design and construction of a solid waste landfill— relevant and appropriate	TDEC 0400-11-01-.04(4)(a)(2)
Leachate collection and removal system	<p>Must be designed, constructed, operated, and maintained to collect and remove leachate from the landfill during the active life and post closure period and ensure that the leachate depth over the liner does not exceed 30 cm. The leachate collection and removal system must comply with paragraphs (c)(3)(iii) and (iv) of this section.</p>	Design of a RCRA landfill— applicable	40 CFR 264.301(c)(2) TDEC 0400-12-01-.06(14)(b)1(ii)
Leak detection system	<p>The leachate collection and removal system between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a leak detection system. This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:</p> <ul style="list-style-type: none"> (i) Constructed with a bottom slope of one percent or more; (ii) Constructed of granular drainage materials with a hydraulic conductivity of 		40 CFR 264.301(c)(3) TDEC 0400-12-01-.06(14)(b)3(iii)

Table G-5. Action-specific ARARs and TBC Guidance (Design Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p>1×10⁻² cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10⁻⁵ m²/sec or more;</p> <p>(iii) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;</p> <p>(iv) Designed and operated to minimize clogging during the active life and post-closure care period; and</p> <p>(v) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in sump and of liquids removed.</p>		
Leak detection system action leakage rate	<p>(a) The action leakage rate is the maximum design flow rate that the leak detection system (LDS) can remove without the fluid head on the bottom liner exceeding 1 foot. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the LDS, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the LDS, and proposed response actions.</p> <p>(b) To determine if the action leakage rate has been exceeded, the owner or operator must convert the weekly or monthly flow rate from the monitoring data obtained under part 264.303(c) of this paragraph to an average daily flow rate (gallons per acre per day) for each sump.</p>		40 CFR 264.302 TDEC 0400-12-01-.06(c)
<i>Storm Water Control for Landfill</i>			
Run-on/runoff control systems	Run-on control system must be capable of preventing flow onto the active portion of the landfill during peak discharge from a 25-year storm event.	Design of a RCRA landfill— applicable	40 CFR 264.301(g) TDEC 0400-12-01-.06(14)(b)(7)
	Run-off management system must be able to collect and control the water volume from a runoff resulting from a 24-hour, 25-year storm event.		40 CFR 264.301(h) TDEC 0400-12-01-.06(14)(b)(8)
	<p>If the landfill site is below the 100-year floodwater elevation, the operator shall provide surface water diversion dikes around the perimeter of the landfill site with a minimum height equal to two feet above the 100-year floodwater elevation.</p> <p>If the landfill site is above the 100-year floodwater elevation, the operators shall provide diversion structures capable of diverting all of the surface water runoff from a 24-hour, 25-year storm.</p>	Design of a TSCA landfill— applicable	40 CFR 761.75(b)(4)(i) and (ii)

Table G-5. Action-specific ARARs and TBC Guidance (Design Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
<i>RCRA Tank System and Impoundment Designs</i>			
Design of a RCRA Tank System	Must prepare an assessment attesting that the tank system design has sufficient structural integrity and is acceptable for the storing/treating of hazardous waste. The assessment must include the information specified in 40 CFR 264.192(a)(1)-(5) [TDEC 0400-12-01-.06(10)(c)(1)-(5)].	Storage of RCRA hazardous waste in a new tank system— relevant and appropriate	40 CFR 264.192(a) TDEC 0400-12-01-.06(10)(c)(1)
	Ancillary equipment (i.e., piping) must be supported and protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.		40 CFR 264.192(e) TDEC 0400-12-01-.06(10)(c)(5)
	Must provide the degree of corrosion protection based upon the information in 40 CFR 264.192(a)(3) (TDEC 0400-12-01-.06[10][c][1][iii]) to ensure the integrity of the tank system during use. Installation of field fabricated corrosion protection system must be supervised by an independent corrosion expert.		40 CFR 264.192(f) TDEC 0400-12-01-.06(10)(c)(6)
	Must provide secondary containment in order to prevent release of hazardous waste or constituents into the environment.		40 CFR 264.193(a)(1) TDEC 0400-12-01-.06(10)(d)(1)
	Secondary containment systems must be: <ul style="list-style-type: none"> • Designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil, groundwater, or surface water at any time during the use of the tank system; and • Capable of detecting and collecting releases and accumulated liquids until the collected material is removed. 		40 CFR 264.193(b) TDEC 0400-12-01-.06(10)(d)(2)

Table G-5. Action-specific ARARs and TBC Guidance (Design Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p>Secondary containment systems must be at a minimum:</p> <ul style="list-style-type: none"> • Constructed of or lined with materials that are compatible with the wastes(s) to be placed in the tank system and must have sufficient strength and thickness to prevent failure owing to pressure gradients (including static head and external hydrological forces), physical contact with the waste to which it is exposed, climatic conditions, and the stress of daily operation (including stresses from nearby vehicular traffic). • Placed on a foundation or base capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system, and capable of preventing failure due to settlement, compression, or uplift; • Provided with a leak-detection system that is designed and operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours, or at the earliest practicable time if the owner or operator can demonstrate to the Regional Administrator that existing detection technologies or site conditions will not allow detection of a release within 24 hours; and • Sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation. Spilled or leaked waste and accumulated precipitation must be removed from the secondary containment system within 24 hours, or in as timely a manner as is possible to prevent harm to human health and environment, if the owner or operator can demonstrate to the Regional Administrator that removal of released waste or accumulated precipitation cannot be accomplished within 24 hours. 		<p>40 CFR 264.193(c) TDEC 0400-12-01-.06(10)(d)(3)</p>
	<p>Secondary containment for tanks must include one or more of the following devices:</p> <ul style="list-style-type: none"> • a liner (external to the tank); • a vault; • a double-walled tank; or • an equivalent device as approved by the EPA. 		<p>40 CFR 264.193(d) TDEC 0400-12-01-.06(10)(d)(4)</p>

Table G-5. Action-specific ARARs and TBC Guidance (Design Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p>External liner systems must be:</p> <ul style="list-style-type: none"> • designed and operated to contain 100 percent of the capacity of the largest tank within its boundary; • designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. (Such additional capacity must be sufficient to contain precipitation from a 25 year, 24-hour rainfall event); • free of cracks or gaps; and • designed and installed to surround the tank completely and to cover all surrounding earth likely to come into contact with the waste if the waste is released from the tank(s) (i.e., capable of preventing lateral as well as vertical migration of the waste). 		<p>40 CFR 264.193(e)(1) TDEC 0400-12-01-.06(10)(d)(5)(i)</p>
	<p>Vault system must be:</p> <ul style="list-style-type: none"> • designed or operated to contain 100 percent of the capacity of the largest tank within its boundary; • designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. (Such additional capacity must be sufficient to contain precipitation from a 25 year, 24-hour rainfall event); • constructed of chemical-resistant water stops in all joints (if any); • provided with an impermeable interior coating or lining that is compatible with the stored waste and that will prevent migration of the waste into the concrete; • provided with a means to protect against formation of and ignition of vapors within the vault if the waste being stored or treated meets the definition of ignitable or reactive waste under 40 CFR 261.21 or 261.23; and • provided with an exterior moisture barrier or otherwise designed or operated to prevent migration of moisture into the vault if the vault is subject to hydraulic pressure. 		<p>40 CFR 264.193(e)(2) TDEC 0400-12-01-.06(10)(d)(5)(ii)</p>
	<p>Double-walled tanks must be:</p> <ul style="list-style-type: none"> • designed as an integral structure (i.e., an inner tank completely enveloped within and outer shell) so that any release from the inner tank is contained by the outer shell; • protected, if constructed of metal, from both corrosion of the primary tank interior and of the external surface of the outer shell; and • provided with a built-in continuous leak detection system capable of detecting a release within 24 hours, or at the earliest practicable time. 		<p>40 CFR 264.193(e)(3) TDEC 0400-12-01-.06(10)(d)(5)(iii)</p>

Table G-5. Action-specific ARARs and TBC Guidance (Design Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p>Ancillary equipment must be provided with secondary containment (e.g., trench, jacketing, double-walled piping) that meets the requirements of 40 CFR 264.193(b) and (c) (TDEC 0400-12-01-.06[10][d][2] and [3]) except for:</p> <ul style="list-style-type: none"> • aboveground piping (exclusive of flanges, joints, valves, and other connections) that are visually inspected for leaks on a daily basis; • welded flanges, welded joints and welded connections, that are visually inspected for leaks on a daily basis; • seamless or magnetic coupling pumps and seal-less valves, that are visually inspected for leaks on a daily basis; and • pressurized aboveground piping systems with automatic shut-off devices (e.g., excess flow check valves, flow metering shutdown devices, loss of pressure actuated shut-off devices) that are visually inspected for leaks on a daily basis. 		<p>40 CFR 264.193(f) TDEC 0400-12-01-.06(10)(d)(6)</p>
Design and installation of a RCRA surface impoundment	Must install a liner system consisting of two or more liners and a leachate collection and removal system, constructed in accordance with 40 CFR 264.221(c)(1)-(4) (TDEC 0400-12-01-.06[11][b][3][i]-[iv]).	Storage of RCRA hazardous waste in a new surface impoundment— relevant and appropriate	40 CFR 264.221(c) TDEC 0400-12-01-.06(11)(b)(3)
	Must implement a leak detection system capable of detecting, collecting and removing leaks of hazardous constituents from all areas of the top liner during the active life and post-closure care period.		40 CFR 264.221(c)(2) TDEC 0400-12-01-.06(11)(b)(3)(ii)
	Must design, construct and maintain dikes with sufficient structural integrity to prevent massive failure.		40 CFR 264.221(h) TDEC 0400-12-01-.06(11)(b)(8)
	Alternative design practices to those in 40 CFR 264.221(c) (TDEC 0400-12-01-.06[11][b][3]) may be approved by the Regional Administrator.		40 CFR 264.221(d) TDEC 0400-12-01-.06(11)(b)(4)
Design and operation of a RCRA container storage area	<p>Storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system defined by paragraph (b) of this section, except as provided by paragraph (d) of this section or provided that:</p> <ol style="list-style-type: none"> (1) Area must be sloped or otherwise designed and operated to drain liquid from precipitation, or (2) The containers must be elevated or otherwise protected from contact with accumulated liquid. 	Storage of RCRA hazardous waste in containers that do not contain free liquids— applicable	40 CFR 264.175(c) TDEC 0400-12-01-.06(9)(f)(3)

Table G-5. Action-specific ARARs and TBC Guidance (Design Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p>Area must have a containment system designed and operated in accordance with 40 CFR 264.175(b) as follows:</p> <ul style="list-style-type: none"> • a base must underlie the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills and accumulated precipitation until the collected material is detected and removed; • base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids; • must have sufficient capacity to contain 10 percent of the volume of containers or volume of largest container, whichever is greater; • run-on into the system must be prevented unless the collection system has sufficient capacity to contain any run-on which might enter the system along with volume required for containers immediately above; and • spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in a timely manner as or necessary to prevent overflow of the collection system. 	<p>Storage in Containers: Storage of RCRA hazardous waste with free liquids or F020, F021, F022, F023, F026 and F027 in containers—applicable</p>	<p>40 CFR 264.175(a), (b), and (d) TDEC 0400-12-01-.06(9)(f)</p>

Table G-6. Action-specific ARARs and TBC Guidance (Construction Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives

Action	Requirements	Prerequisite	Citation
Pre-construction activities	Prior to excavation, all bore holes drilled or dug during subsurface investigation of the site, piezometers, and abandoned wells which are either in or within 100 feet of the areas to be filled must be backfilled with a bentonite slurry or other sealant approved by the Commissioner to an elevation at least ten feet greater than the elevation of the lowest point of the landfill base (including any liner), or to the ground surface if the site will be excavated less than ten feet below grade.	Construction of a solid waste disposal facility— relevant and appropriate	TDEC 0400-11-01-.04(2)(1)
Activities causing fugitive dust emissions	Shall take reasonable precautions to prevent particulate matter from becoming airborne. Reasonable precautions shall include, but are not limited to the following:	Use, construction, alteration, repair or demolition of a building, or appurtenances or a road or the handling, transport or storage of material— applicable	TDEC 1200-3-8-.01(1)
	Use, where possible, of water or chemicals for control of dust in demolition of existing buildings or structures, construction operations, grading of roads, or the clearing of land;		TDEC 1200-3-8-.01(1)(a)
	Application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stock piles, and other surfaces which can create airborne dusts;		TDEC 1200-3-8-.01(1)(b)
	Shall not cause or allow fugitive dust to be emitted in such a manner to exceed 5 minute/hour or 20 minute/day beyond property boundary lines on which emission originates.		TDEC 1200-3-8-.01(2)

Table G-6. Action-specific ARARs and TBC Guidance (Construction Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
Activities causing stormwater runoff (e.g., clearing, grading, excavation)	<p>Implement good construction management techniques (including sediment and erosion, vegetative controls, and structural controls) in accordance with the substantive requirements of General Permit No. TNR10-0000 and TNR05-0000, to ensure stormwater discharge is properly managed and:</p> <ul style="list-style-type: none"> • does not violate water quality criteria as stated in TDEC 0400-40-03-.03, including, but not limited to, prevention of discharge that cause a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of waters of the state for any designated uses for that water body by TDEC 0400-40-04; • does not contain distinctly visible floating scum, oil, or other matter; • does not cause an objectionable color contrast in the receiving stream; and • results in no materials in concentrations sufficient to be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream. • Discharges that would cause measurable degradation of waters with unavailable parameters are not authorized. To be eligible to obtain and maintain coverage, must satisfy, at a minimum, the following additional requirements for discharges into waters with unavailable parameters for siltation and habitat alterations due to in-channel erosion: <ul style="list-style-type: none"> ○ Measures used at the site must be designed to control stormwater runoff generated by a 5-year, 24-hour storm event at a minimum. ○ Additional physical or chemical treatment of stormwater runoff, such as use of treatment chemicals, may be necessary to minimize the amount of sediment being discharged when clay and other fine particle soils are found on sites. 	Stormwater discharges associated with construction activities that disturb ≥ 1 acre total— relevant and appropriate	TCA 69-3-108(1) Tennessee General Permit No. TNR10-0000 (effective October 1, 2016) (TBC) Tennessee General Permit No. TNR10-0000, Sections 5.3.2 and 5.4.1
Activities causing storm water runoff	Shall develop and implement storm water management controls to insure compliance with the terms and conditions of <i>General Permit No. TNR050000</i> (“Stormwater Multi-Sector General Permit for Industrial Activities”) or any applicable site-specific permit.	Existing and new stormwater discharges associated with industrial activity— applicable	TCA 69-3-108(e) through (j) TDEC 0400-40-10-.03(2)(a) <i>General Permit No. TNR05-0000</i> , Sector K (effective April 15, 2015) (TBC)
	Shall develop and maintain a storm water pollution prevention/control plan prepared in accordance with good engineering practices and with the factors outlined in 40 CFR 125.3(d)(2) or (3) as appropriate and any additional requirements listed in Part XI for the particular sector of industrial activity. The plan shall identify potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges associated with industrial activity.		<i>General Permit No. TNR050000</i> , Section 4 (TBC)

Table G-6. Action-specific ARARs and TBC Guidance (Construction Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	Storm water pollution prevention plans shall include, at a minimum, the items identified in <i>General Permit No. TNR050000 Sector K.3</i> , including a description of potential pollution sources, storm water management measures and controls, preventive maintenance, spill prevention and response procedures, and sediment and erosion controls.	Storm water discharges associated with industrial activity at hazardous waste treatment, storage or disposal facilities— TBC	<i>General Permit No. TNR050000 Sector K.3 (TBC)</i>
	Shall monitor at least annually the identified storm water outfalls in accordance with the monitoring requirements specified in <i>General Permit No. TNR050000 Sector K.5</i> and the parameters listed in Table K-1 (effluent limitations in 40 CFR 445, Subpart A) of <i>General Permit No. TNR050000 Sector K</i> , as appropriate [except for landfills operated in conjunction with other industrial or commercial operations when landfill only receives wastes generated by industrial or commercial operation directly associated with the landfill (i.e., “captive landfills”)]. Sampling waivers are available under the conditions specified in <i>General Permit No. TNR050000 Sector K.5.1.3</i> .		<i>General Permit No. TNR050000 Sector K.5 (TBC)</i>
Construction quality assurance	During construction or installation, liners and cover systems must be inspected for uniformity, damage and imperfections (e.g., holes, cracks, thin spots, etc.). Immediately after construction or installation: (1) Synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters; and (2) Soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural non-uniformities that may cause an increase in the permeability of the liner or cover.	Construction of a RCRA landfill— applicable	40 CFR 264.303(a) TDEC 0400-12-01-.06(14)(d)(1)
Construction of new outfall structure for discharge of wastewater	Construction, maintenance, repair, rehabilitation or replacement of intake and outfall structures shall be carried out in such a way that work: <u>Special Conditions</u> <ul style="list-style-type: none"> • Shall be located and oriented such as to avoid permanent alteration or damage to the integrity of the stream channel including the opposite stream bank. Alignment of the outfall structure (except for diffusers) should be as parallel to the stream flow as is practicable, with the discharge pointed downstream. Diffusers may be placed perpendicular to stream flow for more complex mixing. • Intake and outfall structures shall be designed to minimize harm and prevent impoundment of normal or base flows. • Velocity dissipation devices shall be placed as needed at discharge locations to provide a non-erosive velocity from the structure. • Headwalls, bank stabilization materials, and any other hard armoring associated with the installation of each structure shall be limited to a total of 25 ft. along the receiving stream’s bank. 	Construction of intake and outfall structures in waters of the state— applicable	TCA 69-3-108(l) TDEC 0400-40-07-.01 TDEC General Permit for Construction of Intake and Outfall Structures (effective April 7, 2015) (TBC)

Table G-6. Action-specific ARARs and TBC Guidance (Construction Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p><u>General Conditions</u></p> <ul style="list-style-type: none"> Activities, either individually or cumulatively, that result in greater than <i>de minimis</i> degradation to waters of the state are not covered under this permit. Clearing, grubbing and other disturbances to riparian vegetation shall be kept at the minimum necessary for slope construction and equipment operations. Unnecessary riparian vegetation removal, including trees, is prohibited. Native riparian vegetation must be reestablished after work is completed. Non-native, non-invasive annuals may be used as cover crops until native species are established. Coverage under this permit does not serve to waive any local riparian buffer protection requirement, and permittees are responsible for obtaining any necessary local approval. 		
	<ul style="list-style-type: none"> Widening of the stream channel as a result of this activity is prohibited. Activity may not result in a disruption or barrier to the movement of fish and aquatic life. Activities that directly impact wetlands, or impair surface water flow into or out of any wetland area are not covered under this permit. 		
	<ul style="list-style-type: none"> Activities occurring in known or likely habitat of state or federally listed threatened, endangered, deemed in need of management, or species of special concern may not be authorized without prior coordination with the TWRA and TDEC Division of Natural Areas to determine if any special conditions are required to avoid and/or minimize harm to the listed species or their habitat. Adverse effects to federally listed threatened and endangered species are not permitted without prior authorization from the U.S. FWS. 		
	<ul style="list-style-type: none"> Backfill activities must be accomplished in a manner that stabilizes the streambed and banks to prevent erosion. All contours must be returned to pre-project conditions to the extent practicable and completed activities may not disrupt or impound stream flow. 		
	<ul style="list-style-type: none"> Use of monofilament-type erosion control netting or blanket is prohibited. This permit does not authorize impacts to cultural, historic or archaeological features or site. This permit does not authorize access to private property. Arrangements concerning the use of private property shall be made with the landowner. 		
	<ul style="list-style-type: none"> Where practicable, all activities shall be conducted in the dry. All surface water flowing towards this work shall be diverted using cofferdams and/or berms constructed of sandbags, clean rock (containing no fines or soils), steel sheeting, or other non-erodible, non-toxic material. All such diversion materials shall be 		

Table G-6. Action-specific ARARs and TBC Guidance (Construction Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	removed upon completion of work.		
	<ul style="list-style-type: none"> All activities must be carried out in such a manner as will prevent violations of water quality criteria as stated in TDEC 0400-40-03-.03. This includes, but is not limited to, the prevention of any discharge or use of materials that may be harmful to humans, terrestrial or aquatic life, or causes a condition in which visible solids, bottom deposits, or turbidity impairs the designated uses of waters of the state. 		
	<ul style="list-style-type: none"> Erosion prevention and sediment control measures must be in place and functional before earth moving operations begin, and shall be designed according to TDEC's <i>Erosion and Sediment Control Handbook</i>. Permanent vegetative stabilization using native species of all disturbed areas in or near the stream channel must be initiated within 15 days of project completion. Non-native, non-invasive annuals may be used as cover crops until native species can be established. 		
	<ul style="list-style-type: none"> Stream beds must not be used as linear transportation routes for construction equipment. Temporary stream crossings shall be limited to one point in the construction area and erosion control measures shall be utilized where stream bank vegetation is disturbed. The crossing shall be constructed so that stream or wetland flow is not obstructed. Following construction, all materials used for the temporary crossing shall be removed and disturbed streambanks shall be restored and stabilized if needed. 		
Pre-operation/operation of a RCRA tank system (tanks and piping)	Prior to use, must ensure that proper handling procedures are adhered to in order to prevent damage to the system during installation.		40 CFR 264.192(b) TDEC 0400-12-01-.06(10)(c)(2)
	Prior to use, must inspect the system for the presence of weld breaks, punctures, scrapes of protective coatings, cracks, corrosion, other structural damage, or inadequate construction/installation. All discrepancies must be remedied before the system is covered, enclosed or placed in use.		40 CFR 264.192(b)(1)-(6) TDEC 0400-12-01-.06(10)(c)(2)(i)-(vi)
	Prior to use, tanks and ancillary equipment must be tested for tightness. If a tank system is found not to be tight, all repairs necessary to remedy the leak(s) must be performed prior to the system being placed into use.		40 CFR 264.192(d) TDEC 0400-12-01-.06(10)(c)(4)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives

Action	Requirements	Prerequisite	Citation
<i>Emissions and Effluents</i>			
Control of air emissions from an above-grade RCRA tank system	The requirements of 40 CFR 264 Subpart CC do not apply to a waste management unit that is used solely for on-site treatment or storage of hazardous waste that is generated as a result of implementing remedial activities required under CERCLA authorities.	Storage of RCRA hazardous waste in a new tank system— relevant and appropriate	40 CFR 264.1080(b)(5) TDEC 0400-12-01-.32(a)(2)(v)
Control of emissions from a WWTU treatment system	On-site remediation and treatment of contaminated water using air strippers is an exempted air contaminant source provided the emissions are no more than 5 tons per year of any regulated pollutant that is not a hazardous air pollutant and less than 1,000 pounds per year of each hazardous air pollutant.	Emissions of air pollutants from new air contaminant sources— applicable	TDEC 1200-03-09-.04(4)(d)(24)
Activities causing stormwater runoff (e.g., during operations)	Shall develop and implement storm water management controls to insure compliance with the terms and conditions of <i>General Permit No. TNR050000</i> (“Stormwater Multi-Sector General Permit for Industrial Activities”) or any applicable site-specific permit and with TDEC 0400-40-10.03(2)(c).	Storm water discharges associated with industrial activity— applicable	TCA 69-3-108(1) General Permit No. TNR05-0000, Sector K (effective June 1, 2009) (TBC guidance)
	Shall develop and maintain a storm water pollution prevention/control plan prepared in accordance with good engineering practices and with the factors outlined in 40 CFR 125.3(d)(2) or (3) as appropriate and any additional requirements listed in Part XI for the particular sector of industrial activity. The plan shall identify potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges associated with industrial activity.		General Permit No. TNR050000, Section 4
	Storm water pollution prevention plans shall include, at a minimum, the items identified in <i>General Permit No. TNR050000 Sector K.3</i> , including a description of potential pollution sources, storm water management measures and controls, preventive maintenance, spill prevention and response procedures, and sediment and erosion controls.	Storm water discharges associated with industrial activity at hazardous waste treatment, storage or disposal facilities— TBC	General Permit No. TNR050000 Sector K.3
	Shall monitor at least annually the identified storm water outfalls in accordance with the monitoring requirements specified in General Permit No. TNR050000 Sector K.5 and the parameters listed in Table K-1 of General Permit No. TNR050000 Sector K, as appropriate. Sampling waivers are available under the conditions specified in General Permit No. TNR050000 Sector K.5.1.3.		General Permit No. TNR050000 Sector K.5
<i>Secondary Waste and Waste Acceptance Criteria Attainment</i>			
Characterization of solid waste (e.g., contaminated PPE, equipment, spent filters)	Must determine if waste is hazardous waste or if waste is excluded under 40 CFR 261.4; and	Generation of solid waste as defined in 40 CFR 261.2, and which is not excluded under 40 CFR 261.4(a) — applicable	40 CFR 262.11(a) TDEC 0400-12-01-.03(1)(b)(1)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	Must determine if waste is listed under Subpart D of 40 CFR Part 261; or		40 CFR 262.11(b) TDEC 0400-12-01-.03(1)(b)(2)
	Must characterize waste by using prescribed testing methods or applying generator knowledge based on information regarding material or processes used.		40 CFR 262.11(c) TDEC 0400-12-01-.03(1)(b)(3)
Characterization of hazardous waste	If waste is determined to be hazardous, must refer to Parts 261, 262, 264, 266, 268, and 273 of Title 40 for possible exclusions or restrictions pertaining to management of the specific waste.	Generation of RCRA hazardous waste for storage, treatment or disposal— applicable	40 CFR 262.11(d) TDEC 0400-12-01-.03(1)(b)(4)
	Must obtain a detailed chemical and physical analysis of a representative sample of the waste(s) which at a minimum contains all the information which must be known to treat, store, or dispose of the waste in accordance with 40 CFR 264 and 268.		40 CFR 264.13(a)(1) TDEC 0400-12-01-.06(2)(d)(1)
	Must determine if the waste meets the treatment standards in 40 CFR 268.40, 268.45, or 268.49 by testing in accordance with prescribed methods or use of generator knowledge of waste.		40 CFR 268.7(a) TDEC 0400-12-01-.10(1)(g)(1)
	Must determine each EPA Hazardous Waste Number (Waste Code) to determine the applicable treatment standards under 40 CFR 268.40 et seq.		40 CFR 268.9(a) TDEC 0400-12-01-.10(1)(i)(1)
	Must determine the underlying hazardous constituents (as defined in 40 CFR 268.2[i]) in the waste.	Generation of RCRA characteristically hazardous waste (and is not D001 non-wastewaters treated by CMBST, RORGS, or POLYM of Section 268.42 Table 1) for storage, treatment or disposal— applicable	40 CFR 268.9(a); TDEC 0400-12-01-.10(1)(i)(1)
Management of hazardous waste on site	A generator who treats, stores, or disposes of hazardous waste on-site must comply with the applicable [substantive] standards and requirements set forth in 40 CFR parts 264, 265, 266, 268, and 270.	Generation of RCRA hazardous waste for storage, treatment or disposal on-site— applicable if secondary wastes are determined to be hazardous	40 CFR 262.10, Note 2 TDEC 0400-12-01-.03(1)(a)(3)
Temporary storage of hazardous waste in containers on-site – “Satellite Accumulation Area”	A generator may accumulate as much as 55 gal. of hazardous waste at or near any point of generation where wastes initially accumulate which is under the control of the operator of the process generating the waste provided that he: <ul style="list-style-type: none"> complies with 40 CFR 265.171, 265.172 and 265.173(a); and 	Accumulation of 55 gal. or less of RCRA hazardous waste at or near any point of generation— applicable	40 CFR 262.34(c)(1)(i) TDEC 0400-12-01-.03(4)(e)(5)(i)(l)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<ul style="list-style-type: none"> container is be marked with the words “Hazardous Waste” or with other words that identify contents. 		40 CFR 262.34(c)(1)(ii) TDEC 0400-12-01-.03(4)(e)(5)(i)(II)
Temporary storage of hazardous waste in containers on-site – “90-Day Storage Area”	<p>A generator may accumulate hazardous waste at the facility provided that:</p> <ul style="list-style-type: none"> the waste is placed in containers that comply with Subparts I, AA, BB, and CC of 40 CFR 265; and 	Accumulation of RCRA hazardous waste on-site as defined in 40 CFR 260.10— applicable	40 CFR 262.34(a)(1)(i) TDEC 0400-12-01-.03(4)(e)(2)(i)(I)
	<ul style="list-style-type: none"> container is marked with the date upon which each period of accumulation begins and is visible for inspection; and 		40 CFR 262.34(a)(2) TDEC 0400-12-01-.03(4)(e)(2)(ii)
	<ul style="list-style-type: none"> container is marked with the words “Hazardous Waste” 		40 CFR 262.34(a)(3) TDEC 0400-12-01-.03(4)(e)(2)(iii)
Use and management of hazardous waste in containers	If container is not in good condition (e.g., severe rusting, structural defects) or if it begins to leak, must transfer waste into container in good condition.	Storage of RCRA hazardous waste in containers— applicable	40 CFR 264.171 TDEC 0400-12-01-.06(9)(b)
	Use container made or lined with materials compatible with waste to be stored so that the ability of the container is not impaired.		40 CFR 264.172 TDEC 0400-12-01-.06(9)(c)
	Container holding hazardous waste must always be kept closed during storage, except to add/remove waste.		40 CFR 264.173(a) TDEC 0400-12-01-.06(9)(d)
	Container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.		40 CFR 264.173(b) TDEC 0400-12-01-.06(9)(d)
Operation of a RCRA container area	Area must be sloped or otherwise designed and operated to drain liquid from precipitation, or containers must be elevated or otherwise protected from contact with accumulated liquid.	Storage in containers of RCRA hazardous waste that do not contain free liquids— applicable	40 CFR 264.175(c) TDEC 0400-12-01-.06(9)(f)(3)
Storage of RCRA hazardous waste with free liquids in containers	Area must have a containment system designed and operated in accordance with 40 CFR 264.175(b) as follows:	Storage of RCRA hazardous waste with free liquids or storage of waste codes F020, F021, F022, F023, F026 and F027 that do not contain free liquids in containers— applicable	40 CFR 264.175(a) and (d) TDEC 0400-12-01-.06(9)(f)(1) – (2)
	<ul style="list-style-type: none"> a base must underlie the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills and accumulated precipitation until the collected material is detected and removed; 		40 CFR 264.175(b)(1) TDEC 0400-12-01-.06(9)(f)(2)(i)
	<ul style="list-style-type: none"> base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids; 		40 CFR 264.175(b)(2) TDEC 0400-12-01-.06(9)(f)(2)(ii)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<ul style="list-style-type: none"> must have sufficient capacity to contain 10 percent of the volume of containers or volume of largest container, whichever is greater; 		40 CFR 264.175(b)(3) TDEC 0400-12-01-.06(9)(f)(2)(iii)
	<ul style="list-style-type: none"> run-on into the system must be prevented unless the collection system has sufficient capacity to contain any run-on which might enter the system, along with the volume required for containers as listed immediately above; and 		40 CFR 264.175(b)(4) TDEC 0400-12-01-.06(9)(f)(2)(iv)
	<ul style="list-style-type: none"> spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in as timely a manner as is necessary to prevent overflow of the collection system. 		40 CFR 264.175(b)(5) TDEC 0400-12-01-.06(9)(f)(2)(v)
Characterization and management of universal waste	A large quantity handler of universal waste must manage universal waste in accordance with [substantive requirements of] 40 CFR 273 in a way that prevents releases of any universal waste or component of a universal waste to the environment.	Generation of universal waste [as defined in 40 CFR 273] for disposal— applicable	40 CFR 273 TDEC 0400-12-01-.12
	Must label or mark the universal waste to identify the type of universal waste.		40 CFR 273.34 TDEC 0400-12-01-.12(3)(e)
	A large quantity handler of universal waste must immediately contain all releases of universal wastes and other residues from universal wastes, and must determine whether any material resulting from the release is hazardous waste, and if so, must manage the hazardous waste in compliance with all applicable requirements.		40 CFR 273.37 TDEC 0400-12-01-.12(3)(h)
Disposal of universal waste	The generator of the universal waste must determine whether the waste exhibits a characteristic of hazardous waste. If it is determined to exhibit such a characteristic, it must be managed in accordance with 40 CFR 260 through 272 [TDEC 0400-1-11-.01 through .10]. If the waste is not hazardous, the generator may manage and dispose of it in any way that is in compliance with applicable federal, state, and local solid waste regulations.	Generation of universal waste [as defined in 40 CFR 273] for disposal— applicable	40 CFR 273.33 TDEC 0400-12-01-.12(3)(d)
Operation of a Subtitle D solid waste landfill	A facility must be operated and maintained in a manner to minimize litter. Fencing, diking and/or other practices shall be provided as necessary to confine solid wastes subject to dispersal. All litter must be collected for disposal in a timely manner.	Operation of a Subtitle D solid waste landfill— relevant and appropriate	TDEC 0400-11-01-.04(2)(d)
	There must be maintained on-site operating equipment capable of spreading and properly compacting the volume of solid wastes received, and capable of handling the earthwork required. Back-up equipment must be available within 24 hours of primary equipment breakdown.		TDEC 0400-11-01-.04(2)(g)
	Cover material sufficient to meet the initial and intermediate cover requirements of this rule must be available at the facility. If such material must be hauled in from off-site [<i>i.e., off of ORR</i>], at least a 30-day supply must be maintained on site at all times. [Note: <i>Off-site, as referred to here, is assumed to mean off of the ORR.</i>]		TDEC 0400-11-01-.04(2)(h)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p>Collection and holding facilities associated with run-on and run-off control systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.</p> <p>Run-on and run-off must be managed separately from leachate.</p> <p>Other control measures (e.g. temporary mulching or seeding, silt barriers) must be taken as necessary to control erosion of the site.</p>		TDEC 0400-11-01.04(2)(i)
	<p>The operator must take dust control measures as necessary to prevent dust from creating a nuisance or safety hazard to adjacent landowners or to persons engaged in supervising, operating, and using the site. The use of any dust suppressants (other than water) must be approved prior to use.</p>		TDEC 0400-11-01.04(2)(j)
	<p>There must be installed on-site a permanent benchmark (e.g., concrete marker) of known elevation.</p>		TDEC 0400-11-01.04(2)(o)
Waste handling activities at a solid waste landfill	<p>Solid waste disposal activities shall be confined to the smallest practicable area. Compaction will be performed as necessary to ensure a stable fill..</p>	Land disposal of solid waste— relevant and appropriate	TDEC 0400-11-01-.04(6)(b)(1)
	<p>Emplaced solid wastes shall be covered with soil or other material of such depths and at such intervals as is necessary to prevent fire hazards, promote a stable fill, minimize potential harmful releases of solid wastes or solid waste constituents.</p>		TDEC 0400-11-01-.04(6)(b)(2)
Management and storage of used oil	<p>Used oil generators shall not store used oil in units other than tanks, containers, or units subject to regulation under parts 264 or 265 of this chapter.</p>	Generation and storage of used oil, (as defined in 40 CFR 279.1) and possible release— applicable	40 CFR 279.22(a) TDEC 0400-12-01-.11(3)(c)(1)
	<p>Containers and aboveground tanks used to store used oil at generator facilities must be in good condition (no severe rusting, apparent structural defects or deterioration); and not leaking (no visible leaks).</p>		40 CFR 279.22(b)(1) and (2) TDEC 0400-12-01-.11(3)(c)(2)(i) and (ii)
	<p>Containers and aboveground tanks used to store used oil at generator facilities must be labeled or marked clearly with the words “Used Oil.”</p>		40 CFR 279.22(c)(1) and (2) TDEC 0400-12-01-.11(3)(c)(3)(i) and (ii)
	<p>Upon detection of a release of used oil to the environment, a generator must stop the release; contain, clean up, and properly manage the released used oil; and, if necessary, repair or replace any leaking used oil storage containers or tanks prior to returning them to service.</p>		40 CFR 279.22(d) TDEC 0400-12-01-.11(3)(c)(4)
Management of PCB waste (e.g., contaminated PPE, equipment, wastewater)	<p>Any person storing or disposing of PCB waste must do so in accordance with 40 CFR 761, Subpart D</p>	Generation of waste containing PCBs at concentrations \geq 50 ppm— applicable	40 CFR 761.50(a)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	Any person cleaning up and disposing of PCBs shall do so based on the concentration at which the PCBs are found.	Generation of PCB remediation waste as defined in 40 CFR 761.3— applicable	40 CFR 761.61
Temporary storage of PCB waste (e.g., PPE, rags) in a container(s)	Storage area must be clearly marked as required by 40 CFR 761.40(a)(10). Any leaking PCB items and their contents shall be transferred immediately to a properly marked non-leaking container(s). Container(s) shall be in accordance with requirements set forth in DOT HMR at 49 CFR 171-180.	Storage of PCBs and PCB items at concentration \geq 50 ppm for disposal— applicable	40 CFR 761.65(c)(3) 40 CFR 761.65(c)(5) 40 CFR 761.65(c)(6)
Disposal of containers of TSCA PCB wastes	Container(s) shall be marked as illustrated in 40 CFR 761.45(a).	Disposal of PCBs or PCB items in chemical waste landfill— applicable	40 CFR 761.40(a)(1)
Disposal of PCB cleaning solvents, abrasives, and equipment	May be reused after decontamination in accordance with 761.79.	Generation of PCB wastes from the cleanup of PCB remediation wastes— applicable	40 CFR 761.61(a)(5)(v)(B)
Risk-based disposal of PCB remediation waste or bulk product waste	May dispose of in a manner other than prescribed in 40 CFR 761.61(a) or (b) if approved in writing by EPA and method will not pose an unreasonable risk of injury to health or the environment.	Disposal of PCB remediation waste— applicable	40 CFR 761.61(c) 40 CFR 761.62(c)
Performance-based disposal of PCB remediation waste	Shall be disposed according to 40 CFR 761.60(a) or (e), or decontaminate in accordance with 40 CFR 761.79.	Disposal of liquid PCB remediation waste— applicable	40 CFR 761.61(b)(1)
	May dispose by one of the following methods: <ul style="list-style-type: none"> • in a high-temperature incinerator approved under 40 CFR 761.70(b); • by an alternate disposal method approved under 40 CFR 761.60(e); • in a chemical waste landfill approved under 40 CFR 761.75; • in a facility with a coordinated approval issued under 40 CFR 761.77; or 	Disposal of nonliquid PCB remediation waste (as defined in 40 CFR 761.3)— applicable	40 CFR 761.61(b)(2) 40 CFR 761.61(b)(2)(i)
	<ul style="list-style-type: none"> • through decontamination in accordance with 40 CFR 761.79. 		40 CFR 761.61(b)(2)(ii)
Performance-based disposal of PCB bulk product waste	PCB bulk product waste may disposed of by one of the following: <ul style="list-style-type: none"> • in a chemical waste landfill approved under Section 761.75; • in a hazardous waste landfill permitted by EPA under §3004 of RCRA or by authorized state under §3006 of RCRA; 	Disposal of PCB bulk product waste as defined in 40 CFR 761.3— applicable	40 CFR 761.62(a)(2) and (3)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
Disposal of PCB decontamination waste and residues	Such waste shall be disposed of at their existing PCB concentration unless otherwise specified in 40 CFR 761.79(g)(1-6).	Generation of PCB decontamination waste and residues— applicable	40 CFR 761.79(g)
Disposal of decontaminated PCB wastes as non-TSCA wastes	Materials from which PCBs have been removed in accordance with the standards under 40 CFR 761.79(b) or to an alternate risk-based decontamination standard approved by EPA under 40 CFR 761.79(h)(5) are considered unregulated for disposal under Subpart D of TSCA.	Generation of PCB wastes, including water, organic liquids— applicable	40 CFR 761.79(a)(4)
Disposal of TSCA PCB wastes	PCBs and PCB items shall be placed in a manner that will prevent damage to containers or articles.	Disposal of PCBs or PCB items in chemical waste landfill— applicable	40 CFR 761.75(b)(8)(i)
Disposal of TSCA PCB wastes (e.g., from drained electrical equipment)	Bulk liquids not exceeding 500 ppm PCBs may be disposed of provided such waste is pretreated and/or stabilized (e.g., chemically fixed, evaporated, mixed with dry inert absorbent) to reduce its liquid content or increase its solid content so that a non-flowing consistency is achieved to eliminate the presence of free liquids prior to final disposal. PCB Container of liquid PCBs with a concentration between 50 and 500 ppm PCB may be disposed of if each container is surrounded by an amount of inert sorbent material capable of absorbing all of the liquid contents of the container.	Disposal of PCB container with liquid PCB between 50 ppm and 500 ppm into a TSCA chemical waste landfill— applicable	40 CFR 761.75(b)(8)(ii)
Placement of untreated waste in a land disposal facility	This part identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be land disposed.	Treatment of characteristic hazardous waste— applicable	40 CFR 268.1 (a)
Disposal of RCRA hazardous waste in a land-based unit	May be land disposed only if it meets the requirements in the table “Treatment Standards for Hazardous Waste” at 40 CFR 268.40 before land disposal. The table lists either “total waste” standards, “waste-extract” standards, or “technology-specific” standards (as detailed further in 40 CFR 268.42).	Land disposal, as defined in 40 CFR 268.2, of RCRA restricted waste— applicable	40 CFR 268.40(a) TDEC 0400-12-01-.10(3)(a)
	For characteristic wastes (D001 – D043) that are subject to the treatment standards, all underlying hazardous constituents must meet the UTSs specified in 40 CFR 268.48.	Land disposal of restricted RCRA characteristic wastes (D001-D043) that are not managed in a wastewater treatment unit that is regulated under the CWA, that is CWA equivalent, or that is injected into a Class I nonhazardous injection well— applicable	40 CFR 268.40(e) TDEC 0400-12-01-.10(3)(a)(5)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	Are not prohibited if the wastes no longer exhibit a characteristic at the point of land disposal, unless the wastes are subject to a specified method of treatment other than DEACT in 40 CFR 628.40, or are D003 reactive cyanide.	Land disposal of RCRA-restricted characteristic wastes— applicable	40 CFR 268.1(c)(4)(iv) TDEC 0400-12-01-.10(1)(a)(3)(iv)
	Prior to land disposal, soil contaminated with hazardous waste must be treated to meet the applicable alternative treatment standards of 40 CFR 268.49(c) or according to the applicable Universal Treatment Standards in 40 CFR 268.48 applicable to the listed hazardous waste and/or applicable characteristic of hazardous waste if the soil is characteristic.	Land disposal, as defined in 40 CFR 268.2, of RCRA-restricted hazardous soils — applicable	40 CFR 268.49(b) TDEC 0400-12-01-.10(3)(j)(2)
Variance from a treatment standard for RCRA restricted hazardous wastes	<p>A variance from a treatment standard may be approved if it is:</p> <ul style="list-style-type: none"> • not physically possible to treat the waste to the level specified in the treatment standard, or by the method specified as the standard; or • inappropriate to require the waste to be treated to the level specified in the treatment standard or by the method specified as the treatment standard even though such treatment is technically possible. 	Generation of a RCRA hazardous waste requiring treatment prior to land disposal— applicable	40 CFR 268.44 TDEC 0400-12-01-.10(3)(e)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
Treatment and disposal of hazardous debris in a land disposal unit	<p>(a) <i>Treatment standards.</i> Hazardous debris must be treated prior to land disposal as follows unless EPA determines under §261.3(f)(2) of this chapter that the debris is no longer contaminated with hazardous waste or the debris is treated to the waste-specific treatment standard in this subpart for the waste contaminating the debris:</p> <ol style="list-style-type: none"> (1) <i>General.</i> Hazardous debris must be treated for each “contaminant subject to treatment” defined by paragraph (b) of this section using the technology or technologies identified in Table 1 of this section. (2) <i>Characteristic debris.</i> Hazardous debris that exhibits the characteristic of ignitability, corrosivity, or reactivity identified under §261.21, 261.22, and 261.23 of this chapter, respectively, must be deactivated by treatment using one of the technologies identified in Table 1 of this section. (3) <i>Mixtures of debris types.</i> The treatment standards of Table 1 in this section must be achieved for each type of debris contained in a mixture of debris types. If an immobilization technology is used in a treatment train, it must be the last treatment technology used. (4) <i>Mixtures of contaminant types.</i> Debris that is contaminated with two or more contaminants subject to treatment identified under paragraph (b) of this section must be treated for each contaminant using one or more treatment technologies identified in Table 1 of this section. If an immobilization technology is used in a treatment train, it must be the last treatment technology used. (5) <i>Waste PCBs.</i> Hazardous debris that is also a waste PCB under 40 CFR part 761 is subject to the requirements of either 40 CFR part 761 or the requirements of this section, whichever are more stringent. 	Treatment of characteristic hazardous debris— applicable	40 CFR 268.45(a)
	<p>(b) <i>Contaminants subject to treatment.</i> Hazardous debris must be treated for each “contaminant subject to treatment.” The contaminants subject to treatment must be determined as follows:</p> <ol style="list-style-type: none"> (1) <i>Toxicity characteristic debris.</i> The contaminants subject to treatment for debris that exhibits the Toxicity Characteristic (TC) by §261.24 of this chapter are those EP constituents for which the debris exhibits the TC toxicity characteristic. 		40 CFR 268.45(b)(1)
	<p>(c) <i>Conditioned exclusion of treated debris.</i> Hazardous debris that has been treated using one of the specified extraction or destruction technologies in Table 1 of this section and that does not exhibit a characteristic of hazardous waste identified under subpart C, part 261, of this chapter after treatment is not a hazardous waste and need not be managed in a subtitle C facility. Hazardous debris contaminated with a listed waste that is treated by an immobilization technology specified in</p>		40 CFR 268.45(c)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	Table 1 is a hazardous waste and must be managed in a subtitle C facility.		
Disposal requirements for particular RCRA waste forms and types	Except as provided in paragraph (b) of this section, and in §264.316, ignitable or reactive RCRA waste must not be placed in a landfill unless the waste and the landfill meet all applicable provisions of 40 CFR Part 268; and (1) the resulting waste, mixture or dissolution of material no longer meets the definition of ignitable or reactive waste under §261.21 or §261.23 of this chapter; and (2) 40 CFR 264.17(b) is complied with.	Disposal of ignitable or reactive RCRA waste— applicable	40 CFR 264.312(a) TDEC 0400-12-01-.06(14)(m)(1)
	Must not be placed into a cell unless 40 CFR 264.17(b) is complied with (see below).	Disposal of incompatible wastes in a RCRA landfill— applicable	40 CFR 264.313 TDEC 0400-12-01-.06(14)(n)
Treatment and disposal of ignitable, reactive, or incompatible RCRA wastes	<p>Must take precautions to prevent reactions which:</p> <ul style="list-style-type: none"> • generate extreme heat, pressure, fire or explosion, or produce uncontrolled fumes or gases which pose a risk of fire or explosion; • produce uncontrolled toxic fumes or gases which threaten human health or the environment; • damage the structural integrity of the device or facility 	Operation of a RCRA facility that treats, stores, or disposes of ignitable, reactive, or incompatible wastes— applicable	40 CFR 264.17(b) TDEC 0400-12-01-.06(2)(h)(2)
Disposal of bulk or containerized liquids in a RCRA landfill	May not dispose of bulk or non-containerized liquid hazardous waste or hazardous waste containing free liquids (whether or not sorbents have been added) in any landfill.	Placement of bulk or non-containerized RCRA hazardous waste— applicable	40 CFR 264.314(a) TDEC 0400-12-01-.06(14)(o)(1)
Disposal of containers in RCRA landfill	May not place containers holding free liquid in a landfill unless the liquid is mixed with an absorbent, solidified, removed, or otherwise eliminated.	Placement of containers containing RCRA hazardous waste in a landfill— applicable	40 CFR 264.314(c) TDEC 0400-12-01-.06(14)(o)(3)
	Sorbents used to treat free liquids to be disposed of in landfills must be non-biodegradable as described in 264.314(d)(1).		40 CFR 264.314(d) TDEC 0400-12-01-.06(14)(o)(5)
	Unless they are very small, containers must be either at least 90% full when placed in the landfill, or crushed, shredded, or similarly reduced in volume to the maximum practical extent before burial in the landfill.		40 CFR 264.315 TDEC 0400-12-01-.06(14)(p)
Construction and operation of a volume reduction facility (miscellaneous treatment facility)	Follow design and operating standards that ensure protection of human health and the environment for units in which hazardous waste is treated.	Processes involving treatment of RCRA hazardous waste in a miscellaneous unit as defined in 40 CFR 260.10— applicable to volume reduction facility	40 CFR 264.601 TDEC 0400-12-01-.06(27)(b)
	<p>Prevent any releases that may have adverse effects on human health or the environment due to migration of waste constituents, specifically preventing adverse effects in:</p> <ul style="list-style-type: none"> • the groundwater or subsurface environment • surface water, or wetlands, or the soil surface; • the air 		40 CFR 264.601(a) through (c) TDEC 0400-12-01-.06(27)(b)(1) through (3)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	A miscellaneous unit that is a disposal unit must be maintained in a manner that complies with §264.601 during the post-closure care period. In addition, if a treatment or storage unit has contaminated soils or groundwater that cannot be completely removed or decontaminated during closure, then that unit must also meet the requirements of §264.601 during post-closure care. The post-closure plan under §264.118 must specify the procedures that will be used to satisfy this requirement.		40 CFR 264.603 TDEC 0400-12-01-.06(27)(d)
Characterization of LLW (e.g., wastewater, contaminated PPE)	Shall be characterized using direct or indirect methods and the characterization documented in sufficient detail to ensure safe management and compliance with the WAC of the receiving facility.	Generation of LLW for storage and disposal at a DOE facility— TBC	DOE M 435.1-1(IV)(I)
	Characterization data shall, at a minimum, include the following information relevant to the management of the waste: <ul style="list-style-type: none"> • physical and chemical characteristics; • volume, including the waste and any stabilization or absorbent media; • weight of the container and contents; • identities, activities, and concentrations of major radionuclides; • characterization date; • generating source. 		DOE M 435.1-1(IV)(I)(2)
Packaging of LLW for disposal	Must not be packaged for disposal in cardboard or fiberboard boxes.	Generation of LLW for disposal at a LLW disposal facility— relevant and appropriate	TDEC 0400-20-11-.17(7)(a)(1)
	Must be solidified or packaged in sufficient absorbent material to absorb twice the volume of liquid.	Generation of liquid LLW for disposal at a LLW disposal facility— relevant and appropriate	TDEC 0400-20-11-.17(7)(a)(2)
	Shall contain as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1 percent of the volume.	Generation of solid LLW containing liquid for disposal at a LLW disposal facility— relevant and appropriate	TDEC 0400-20-11-.17(7)(a)(3)
	Must not be capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures or of explosive reaction with water.	Generation of LLW for disposal at a LLW disposal facility— relevant and appropriate	TDEC 0400-20-11-.17(7)(a)(4)
	Must not contain, or be capable of, generating quantities of toxic gases, vapor, or fumes.		TDEC 0400-20-11-.17(7)(a)(5)
	Must not be pyrophoric.		TDEC 0400-20-11-.17(7)(a)(6)
	Must have structural stability either by processing the waste or placing the waste in a		TDEC 0400-20-11-.17(7)(b)(1)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	container or structure that provides stability after disposal.		
	Must be converted into a form that contains as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1 percent of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5 percent of the volume of the waste for waste processed to a stable form.	Generation of liquid LLW or LLW containing liquids for disposal at a LLW disposal facility— relevant and appropriate	TDEC 0400-20-11-.17(7)(b)(2)
	Void spaces within the waste and between the waste and its package must be reduced to the extent practicable.	Generation of LLW for disposal at a LLW disposal facility— relevant and appropriate	TDEC 0400-20-11-.17(7)(b)(3)
Temporary storage of LLW	Shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water.	Management of LLW at a DOE facility— TBC	DOE M 435.1-1(IV)(N)(1)
	Shall be stored in a location and manner that protects the integrity of waste for the expected time of storage and minimizes worker exposure.		DOE M 435.1-1(IV)(N)(3)
	Shall be managed to identify and segregate LLW from mixed waste.		DOE M 435.1-1(IV)(N)(6)
	Shall be packaged in a manner that provides containment and protection for the duration of the anticipated storage period and until disposal is achieved or until the waste has been removed from the container.	Storage of LLW in containers at a DOE facility— TBC	DOE M 435.1-1(IV)(L)(1)(a)
	Vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container.		DOE M 435.1-1(IV)(L)(1)(b)
	Containers shall be marked such that their contents can be identified.		DOE M 435.1-1(IV)(L)(1)(c)
Treatment of LLW	Treatment to provide more stable waste forms and to improve the long-term performance of a LLW disposal facility shall be implemented as necessary.	Generation for disposal of LLW at a DOE facility— TBC	DOE M 435.1-1(IV)(O)
Disposal of LLW at an off-site disposal facility or in the EMWMF	LLW shall be certified as meeting waste acceptance requirements before it is transferred to the receiving facility.		DOE M 435.1-1(IV)(J)(2)
Transportation			
Transportation of hazardous waste on-site	The generator manifesting requirements of 40 CFR 262.20-262.32(b) do not apply. Generator or transporter must comply with the requirements set forth in 40 CFR 263.30 and 263.31 in the event of a discharge of hazardous waste on a private or public right-of-way.	Transportation of hazardous wastes on a public or private right-of-way within or along the border of contiguous property under the control of the same person, even if such contiguous property is divided by a public or private right-of-	40 CFR 262.20(f) TDEC 0400-12-01-.03(3)(a)(6)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
		way— applicable	
Transportation of universal waste off-site	Off-site shipments of universal waste by a large quantity handler of universal waste shall be made in accordance with 40 CFR 273-38 (TDEC 0400-1-11-.12[3][i]).	Preparation of off-site shipments of universal waste by a large quantity generator of universal waste— applicable	40 CFR 273.38 TDEC 0400-1-11-.12(3)(i)
Transportation of used oil off-site	Except as provided in paragraphs (a) to (c) of this rule, generators must ensure that their used oil is transported by transporters who have obtained U.S. EPA ID numbers.	Preparation of off-site shipment of used oil by generators of used oil— applicable	40 CFR 279.24 TDEC 0400-1-11-.11(3)(e)
Transportation of LLW off-site	LLW waste shall be packaged and transported in accordance with DOE O 1460.1A and DOE O 460.2.	Preparation of off-site shipment of LLW— TBC	DOE M 435.1-1(I)(1)(E)(11)
	To the extent practicable, the volume of waste and number of shipments shall be minimized.		DOE M 435.1-1(IV)(L)(2)
General Operations			
Incompatible wastes	Incompatible wastes must not be placed in the same landfill cell unless 40 CFR 264.17(b) is complied with.	Disposal of incompatible wastes in a RCRA landfill— applicable	40 CFR 264.313 TDEC 0400-12-01-.06(14)(n)
Waste placement	Wastes must be emplaced in a manner that maintain the package integrity during emplacement, minimizes the void spaces between packages and permit the void spaces to be filled.	Disposal of LLW on land— relevant and appropriate	TDEC 0400-20-11-.17(3)(d)
	Void spaces between packages must be filled with earth or other material to reduce future subsidence within the disposal unit.		TDEC 0400-20-11-.17(3)(e)
	Closure and stabilization measures as set forth in the closure plan must be carried out as each disposal unit is filled and covered.		TDEC 0400-20-11-.17(3)(i)
	Active waste disposal operations must not have an adverse effect on completed closure and stabilization measures.		TDEC 0400-20-11-.17(3)(j)
Security system	Must prevent the unknowing entry and minimize the possibility for unauthorized entry of persons or livestock onto active portion of the facility or comply with provisions of 40 CFR 264.14(b) and (c).	Operation of a RCRA landfill— applicable	40 CFR 264.14 TDEC 0400-12-01-.06(2)(e)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p>Unless a natural barrier adequately deters access by the general public, either warning signs and fencing must be installed and maintained as follows, or the requirements of paragraph (c)(1) of this section must be met.</p> <p>(1) Warning signs must be displayed at all entrances and at intervals of 100 m (330 ft) or less along the property line of site or along the perimeter of the sections of site where asbestos-containing waste material is deposited. The warning signs must:</p> <p>(i) Be posted in such a manner and location that a person can easily read the legend; and</p> <p>(ii) Conform to the requirements of 51 cm × 36 cm (20"×14") upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and</p> <p>(iii) Display the legend, as listed in 40 CFR 61.154(b)(1)(iii), in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph.</p>	<p>Operation of an active waste disposal site that receives asbestos-containing material from a source covered under 40 CFR 61.145—applicable</p>	<p>40 CFR 61.154(b)(1)</p>
	<p>The perimeter of the disposal site must be fenced in a manner adequately to deter access by the general public.</p>		<p>40 CFR 61.154(b)(2)</p>
	<p>Supporting facilities:</p> <p>(i) A 6-ft woven mesh fence, wall or similar device shall be placed around the site to prevent unauthorized access.</p> <p>(ii) Roads shall be maintained to and within the site which are adequate to support the operation and maintenance of the site without causing safety or nuisance problems or hazardous conditions.</p> <p>(iii) Site shall be operated and maintained to prevent hazardous conditions resulting from spilled liquids and windblown materials.</p>	<p>Construction of a TSCA chemical waste landfill—applicable</p>	<p>40 CFR 761.75(b)(9)</p>
General inspections	<p>Operators must inspect facility for malfunctions and deterioration, operator errors, and discharges, often enough to identify and correct any problems.</p>	<p>Operation of a RCRA hazardous waste landfill—applicable</p>	<p>40 CFR 264.15(a) TDEC 0400-12-01-.06(2)(f)(1)</p>
	<p>Operators must remedy any deterioration or malfunction of equipment or structures on a schedule that ensures that the problem does not lead to an environmental or human health hazard.</p>		<p>40 CFR 264.15(c) TDEC 0400-12-01-.06(2)(f)(3)</p>
Inspection of landfill following storms	<p>Must inspect landfill weekly and after storm events to ensure proper functioning of:</p> <p>(i) Deterioration, malfunctions, or improper operation of run-on and run-off control systems;</p> <p>(ii) Proper functioning of wind dispersal control systems, where present; and</p> <p>(iii) The presence of leachate in and proper functioning of leachate collection and</p>	<p>Operation of a RCRA hazardous waste landfill—applicable</p>	<p>40 CFR 264.303(b) TDEC 0400-12-01-.06(14)(d)(2)</p>

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	removal systems, where present.		
Inspection of landfill	Must record the amount of liquids removed from the leak detection system sumps at least weekly during the active life and closure period.		40 CFR 264.303(c)(1) TDEC 0400-12-01-.06(14)(d)(3)(i)
Personnel training	Operators must ensure personnel adequately trained in hazardous waste, emergency response, monitoring equipment maintenance, alarm system procedures, etc.		40 CFR 264.16 TDEC 0400-12-01-.06(2)(g)
Construction quality assurance program	Operators must develop and implement a Construction Quality Assurance Program to ensure that the unit meets or exceeds all design criteria and specifications for all physical components including: foundations, dikes, liners, geomembranes, leachate collection and removal systems, leak detection systems and final covers in accordance with remaining provisions of 40 CFR 264.19.		40 CFR 264.19 TDEC 0400-12-01-.06(2)(j)
Contingency plan	Operators must have a contingency plan, designed to minimize hazards to human health and the environment from fires, explosions or other unplanned sudden releases of hazardous waste to air, soil, or surface water in accordance with 40 CFR 264.52.		40 CFR 264.51 TDEC 0400-12-01-.06(4)(b)
	Operators must have at least one emergency coordinator on the facility premises responsible for coordinating emergency response measures in accordance with 40 CFR 264.56.		40 CFR 264.55 TDEC 0400-12-01-.06(4)(f)
Inventory requirements	The owner or operator of a landfill must maintain the following items in the operating record required under §264.73: (a) On a map, the exact location and dimensions, including depth, of each cell with respect to permanently surveyed benchmarks; and (b) The contents of each cell and the approximate location of each hazardous waste type within each cell.	Operation of a RCRA hazardous waste landfill— applicable	40 CFR 264.309 TDEC 0400-12-01-.06(14)(j)
	Maintain, until closure, records of the location, depth and area, and quantity in cubic yards of asbestos containing material within the disposal site on a map or diagram.	Operation of an active waste disposal site that receives ACM from a source covered under 40 CFR 61.145— applicable	40 CFR 61.154(f)
	Disposal records shall include information on the PCB concentration in the liquid wastes and the three dimensional burial coordinates for PCBs and PCB items.	Operation of a TSCA chemical waste landfill— applicable	40 CFR 761.75(b)(8)(iv)
	Boundaries and locations of each disposal unit must be accurately located and mapped by means of a land survey. Units must be marked in such a way that the boundaries of each unit can be easily defined. Three permanent survey marker control points, referenced to USGS or NGS survey control stations, must be established on site to facilitate surveys. The USGS or NGS control states must provide horizontal and vertical controls as checked against USGS or NGS record files.	Land disposal of LLW— relevant and appropriate	TDEC 0400-20-11-.17(3)(g)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
Leak detection system operation	Must collect and remove liquids in the leak detection system sumps to minimize the head on the bottom liner.	Operation of a RCRA landfill— applicable	40 CFR 264.301(c)(4) TDEC 0400-12-01-.06(14)(b)3(iv)
Run-on/runoff control systems	Collection and holding facilities must be emptied or otherwise expeditiously managed after storm events to maintain design capacity of the system		40 CFR 264.301(i) TDEC 0400-12-01-.06(14)(b)(9)
Wind dispersal control system	Must cover or manage the landfill to control wind dispersal of particulate matter		40 CFR 264.301(j) TDEC 0400-12-01-.06(14)(b)(10)
Control wind dispersal of asbestos wastes	Must be no visible emissions to the outside air; or	Operation of an active waste disposal site that receives ACM from a source covered under 40 CFR 61.145— applicable	40 CFR 61.154(a)
	Rather than meet the no visible emission requirement of paragraph (a) of this section, at the end of each operating day, or at least once every 24-hour period while the site is in continuous operation, the asbestos-containing waste material that has been deposited at the site during the operating day or previous 24-hour period shall: (1) Be covered with at least 15 centimeters (6 inches) of compacted non-asbestos-containing material, or (2) Be covered with a resinous or petroleum-based dust suppression agent that effectively binds dust and controls wind erosion. Such an agent shall be used in the manner and frequency recommended for the particular dust by the dust suppression agent manufacturer to achieve and maintain dust control.		40 CFR 61.154(c)
Response actions for leak detection system	Must have a response action plan which sets forth the actions to be taken if action leakage rate has been exceeded.	Operation of a RCRA landfill leak detection system— applicable	40 CFR 264.304(a) TDEC 0400-12-01-.06(14)(e)(1)
	Must determine to the extent practicable the location, size and cause of any leak.	Flow rate into the leak detection system exceeds action leakage rate for any sump— applicable	40 CFR 264.304(b)(3) TDEC 0400-12-01-.06(14)(e)(2)(iii)
	Must determine whether waste receipt should cease or be curtailed; whether any waste should be removed from the unit for inspection, repairs, or controls, and whether or not the unit should be closed.		40 CFR 264.304(b)(4) TDEC 0400-12-01-.06(14)(e)(2)(iv)
	Must determine any other short or long-term actions to be taken to mitigate or stop leaks.		40 CFR 264.304(b)(5) TDEC 0400-12-01-.06(14)(e)(2)(v)

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<p>To make the leak and/or remediation determinations, must:</p> <ul style="list-style-type: none"> (i)(I) Assess the source and amounts of the liquids by source; (i)(II) Conduct a hazardous constituent or other analyses of the liquids in the leak detection system to identify sources and possible location of leaks, and the hazard and mobility of the liquid; and (i)(III) Assess the seriousness of leaks in terms of potential for escaping into the environment; or (ii) Document why such assessments are not needed. 	<p>Operation of a RCRA landfill leak detection system—applicable</p>	<p>40 CFR 264.304(c) TDEC 0400-12-01-.06(14)(e)(3)</p>
<p>Operation of a RCRA tank system</p>	<p>Hazardous wastes or treatment reagents must not be placed in the tank system if they could cause the tank, its ancillary equipment or the containment system to rupture, leak, corrode, or otherwise fail.</p>	<p>Storage of RCRA hazardous waste in a new tank system—relevant and appropriate</p>	<p>40 CFR 264.194(a) TDEC 0400-12-01-.06(10)(e)(1)</p>
	<p>Must use appropriate controls and practices to prevent spills and overflows from the tank or containment system. These include at a minimum:</p> <ul style="list-style-type: none"> • spill prevention controls (e.g., check valves, dry disconnect couplings); • overflow prevention controls (e.g., level sensing devices, high level alarms, automatic feed cutoff, or bypass to a standby tank; and • maintenance of sufficient freeboard in uncovered tanks to prevent overtopping by wave or wind action or by precipitation. 		<p>40 CFR 264.194(b) TDEC 0400-12-01-.06(10)(e)(2)</p>
	<p>Must comply with the requirements of 40 CFR 264.196 (TDEC 0400-12-01-.06[10][g]) if a leak or a spill occurs in the tank system.</p>		<p>40 CFR 264.194(c) TDEC 0400-12-01-.06(10)(e)(3)</p>
<p>Operation of a RCRA surface impoundment</p>	<p>Design and operate facility to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and wave action; rainfall; run-on; malfunctions of level controllers, alarms and other equipment; and human error.</p>	<p>Storage of RCRA hazardous waste in a surface impoundment—relevant and appropriate</p>	<p>40 CFR 264.221(g) TDEC 0400-12-01-.06(11)(b)(7)</p>
	<p>Remove surface impoundment from operation if the dike leaks or if there is a sudden drop in liquid level.</p>		<p>40 CFR 264.227 TDEC 0400-12-01-.06(11)(h)</p>
<p>Operation of a landfill accepting asbestos waste</p>	<p>Either discharge no visible emissions to the outside air; or</p> <p>Rather than meet the no visible emission requirement of paragraph (a) of this section, at the end of each operating day, or at least once every 24-hour period while the site is in continuous operation, the asbestos-containing waste material that has been deposited at the site during the operating day or previous 24-hour period shall:</p> <ul style="list-style-type: none"> (1) Be covered with at least 15 centimeters (6 inches) of compacted non-asbestos-containing material, or (2) Be covered with a resinous or petroleum-based dust suppression agent that 	<p>Disposal of asbestos-containing material—applicable</p>	<p>40 CFR 61.154(a)(1) 40 CFR 61.154(c)(1)</p>

Table G-7. Action-specific ARARs and TBC Guidance (Operations Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	effectively binds dust and controls wind erosion. Such an agent shall be used in the manner and frequency recommended for the particular dust by the dust suppression agent manufacturer to achieve and maintain dust control.		
	<p>Unless a natural barrier adequately deters access by the general public, either warning signs and fencing must be installed and maintained as follows, or the requirements of paragraph (c)(1) of this section must be met.</p> <p>(1) Warning signs must be displayed at all entrances and at intervals of 100 m (330 ft) or less along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material is deposited. The warning signs must:</p> <ul style="list-style-type: none"> (i) Be posted in such a manner and location that a person can easily read the legend; and (ii) Conform to the requirements of 51 cm × 36 cm (20"×14") upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and (iii) Display the legend, as listed in 40 CFR 61.154(b)(1)(iii), in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph. 	Operation of an active waste disposal site that receives asbestos-containing material from a source covered under 40 CFR 61.145— applicable	40 CFR § 61.154(b)(1)
	The perimeter of the disposal site must be fenced in a manner adequately to deter access by the general public.		40 CFR § 61.154(b)(2)

Table G-8. Action-specific ARARs and TBC Guidance (Environmental Monitoring Requirements – All Phases) for CERCLA Waste Disposal, On-site Disposal Alternatives

Action	Requirements	Prerequisite	Citation
Pre-operations monitoring	A preoperational monitoring program must be conducted to provide basic environmental data on the disposal site characteristics including information about the ecology, meteorology, climate, hydrology, geology, geochemistry and seismology of the disposal site. For those characteristics that are subject to seasonal variation, data must cover at least a 12-month period.	Land disposal of LLW— relevant and appropriate	TDEC 0400-20-11-.17(4)(a)
Corrective measures based on monitoring	Must have plans for taking corrective measures if migration of radionuclides would indicate that the performance objectives may not be met. <i>[Note: Performance Objectives are those given at TDEC 0400-20-11-.16(1), (2), and (5).]</i>	Land disposal of LLW— relevant and appropriate	TDEC 0400-20-11-.17(4)(b)
Construction and operations monitoring	During site construction and operation, shall maintain a monitoring program, including a monitoring system. The monitoring system must be capable of providing early warning of releases of radionuclides from the disposal unit before they leave the site boundary.	Land disposal of LLW— relevant and appropriate	TDEC 0400-20-11-.17(4)(c)
Post-operations monitoring	After the disposal site is closed, post-operational surveillance of the disposal site shall be maintained by a monitoring system based on the operating history and the closure and stabilization of the disposal site.	Land disposal of LLW— relevant and appropriate	TDEC 0400-20-11-.17(4)(d)
Groundwater and surface water monitoring	The groundwater and surface water from the disposal site area must be sampled prior to commencing operation for use as baseline data	Construction of TSCA chemical waste landfill— applicable	40 CFR § 761.75(b)(6)(i)(A)
Surface water monitoring	Designated surface water course shall be sampled at least monthly when the landfill is being used for disposal.	Operation of a TSCA chemical waste landfill— applicable	40 CFR § 761.75(b)(6)(i)(B)
Leachate collection system	Leachate collection systems shall be monitored monthly for quantity and physicochemical characteristics of leachate produced. The leachate should be either treated to acceptable limits for discharge in accordance with a State or Federal permit or disposed of by another State or Federally approved method. Water analysis shall be conducted as provided in paragraph (b)(6)(iii) of this section.	Operation of a TSCA chemical waste landfill— applicable	40 CFR § 761.75(b)(7)

Table G-8. Action-specific ARARs and TBC Guidance (Environmental Monitoring Requirements – All Phases) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
Monitoring well construction and operation	All monitoring wells shall be cased and the annular space between the monitor zone (zone of saturation) and the surface shall be completely backfilled with Portland cement or an equivalent material and plugged with Portland cement to effectively prevent percolation of surface water into the well bore. The well opening at the surface shall have a removable cap to provide access and to prevent entrance of rainfall or stormwater runoff. The groundwater monitoring well shall be pumped to remove the volume of liquid initially contained in the well before obtaining a sample for analysis. The discharge shall be treated to meet applicable State or Federal standards or recycled to the chemical waste landfill.	Construction and operation of a TSCA groundwater monitoring well— applicable	40 CFR § 761.75(b)(6)(ii)(B)
Operation of leachate collection system	After the cover is installed, must record the amount of liquids removed from the leak detection system at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months.	Closure of a RCRA landfill— applicable	40 CFR § 264.303(c)(2) TDEC 0400-12-01-.06(14)(d)(3)(ii)
General post-closure care	Must maintain and monitor a groundwater monitoring system and comply with all other applicable provisions of 40 CFR 264, Subpart F.		40 CFR § 264.310(b)(4) TDEC 0400-12-01-.06(14)(k)(2)(iv)
Determining RCRA Concentration Limits	Concentration limits shall be determined taking into account those constituents that are reasonably expected to be contained in or derived from waste present in the landfill. These limits must not exceed those listed in TDEC 0400-12-.06(6)(f)(1), Table 1.	RCRA hazardous constituents detected in groundwater in the uppermost aquifer underlying a hazardous waste landfill— applicable	40 CFR § 264.94(a) TDEC 0400-12-.06(6)(f)(1)
Groundwater monitoring well construction	All monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of ground-water samples. The annular space (i.e., the space between the bore hole and well casing) above the sampling depth must be sealed to prevent contamination of samples and the groundwater.	Construction of RCRA groundwater monitoring well— applicable	40 CFR § 264.97(c) TDEC 0400-12-01-.06(6)(h)(3)

Table G-8. Action-specific ARARs and TBC Guidance (Environmental Monitoring Requirements – All Phases) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
Groundwater monitoring requirements for RCRA hazardous waste landfills	<p>The groundwater monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths to yield samples from the uppermost aquifer that:</p> <ul style="list-style-type: none"> • Represent the quality of background groundwater; • Represent the quality of groundwater passing the point of compliance; and • Allow for the detection of contamination when the hazardous waste or constituents have migrated from the waste management area to the uppermost aquifer. 	Operation of a detection monitoring program under 40 <i>CFR</i> § 264.98— applicable	40 <i>CFR</i> § 264.97(a) TDEC 0400-12-01-.06(6)(h)(1)
	Groundwater monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide a reliable indication of groundwater quality below the waste management area.		40 <i>CFR</i> § 264.97(d) TDEC 0400-12-01-.06(6)(h)(4)
	Groundwater monitoring program must include sampling and analytical methods that are appropriate and accurately measure hazardous constituents in groundwater samples.		40 <i>CFR</i> § 264.97(e) TDEC 0400-12-01-.06(6)(h)(5)
	Groundwater monitoring program must include a determination of the groundwater surface elevation each time groundwater is sampled.		40 <i>CFR</i> § 264.97(f) TDEC 0400-12-01-.06(6)(h)(6)
	The number and size of samples collected to establish background and measure groundwater quality at the point of compliance shall be appropriate for the form of statistical test employed following generally accepted statistical principles.		40 <i>CFR</i> § 264.97(g) TDEC 0400-12-01-.06(6)(h)(7)
	The owner or operator will specify one of the following statistical methods to be used in evaluating groundwater monitoring data for each hazardous constituent. The statistical test chosen shall be conducted separately for each hazardous constituent in each well. Where PQLs are used in any of the following statistical procedures to comply with §264.97(i)(5), the PQL must be proposed by the owner or operator and approved by Tennessee and EPA through the CERCLA process. Use of any of the following statistical methods must be protective of human health and the environment and must comply with the performance standards outlined in 40 <i>CFR</i> § 264.97(i).	Operation of a detection monitoring program under 40 <i>CFR</i> § 264.98— applicable	40 <i>CFR</i> § 264.97(h) TDEC 0400-12-01-.06(6)(h)(8)
	<ul style="list-style-type: none"> • A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent. 		40 <i>CFR</i> § 264.97(h)(1) TDEC 0400-12-01-.06(6)(h)(8)(i)
	<ul style="list-style-type: none"> • An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent. 		40 <i>CFR</i> § 264.97(h)(2) TDEC 0400-12-01-.06(6)(h)(8)(ii)
	<ul style="list-style-type: none"> • A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of background data and level of each constituent in each compliance well is compared to the upper tolerance or prediction limit. 		40 <i>CFR</i> § 264.97(h)(3) TDEC 0400-12-01-.06(6)(h)(8)(iii)

Table G-8. Action-specific ARARs and TBC Guidance (Environmental Monitoring Requirements – All Phases) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	<ul style="list-style-type: none"> A control chart approach that gives control limits for each constituent. 		40 <i>CFR</i> § 264.97(h)(4) TDEC 0400-12-01-.06(6)(h)(8)(iv)
	<ul style="list-style-type: none"> Another statistical test method submitted by the owner or operator and approved by Tennessee and EPA through the CERCLA process. 		40 <i>CFR</i> § 264.97(h)(5) TDEC 0400-12-01-.06(6)(h)(8)(iv)
	Any statistical method chosen under § 264.97(h) shall comply with the following performance standards, as appropriate:	Operation of a detection monitoring program under 40 <i>CFR</i> § 264.98— applicable	40 <i>CFR</i> § 264.97(i) TDEC 0400-12-01-.06(6)(h)(9)
	<ul style="list-style-type: none"> The statistical method used to evaluate groundwater monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed. 		40 <i>CFR</i> § 264.97(i)(1) TDEC 0400-12-01-.06(6)(h)(9)(i)
	<ul style="list-style-type: none"> If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a ground-water protection standard, the test shall be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type I experiment wise error rate for each testing period shall be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts. 		40 <i>CFR</i> § 264.97(i)(2) TDEC 0400-12-01-.06(6)(h)(9)(ii)
	<ul style="list-style-type: none"> If a control chart approach is used to evaluate groundwater monitoring data, the specific type of control chart and its associated parameter values shall be proposed by the owner or operator and approved by Tennessee and EPA through the CERCLA process. 		40 <i>CFR</i> § 264.97(i)(3) TDEC 0400-12-01-.06(6)(h)(9)(iii)
	<ul style="list-style-type: none"> If a tolerance interval or a prediction interval is used to evaluate groundwater monitoring data, the levels of confidence, and, for tolerance intervals, the percentage of the population that the interval must contain, shall be proposed by the owner or operator and approved by Tennessee and EPA through the CERCLA process. These parameters will be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern. 		40 <i>CFR</i> § 264.97(i)(4) TDEC 0400-12-01-.06(6)(h)(9)(iv)
	<ul style="list-style-type: none"> The statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any PQL approved by Tennessee and EPA through the CERCLA process under § 264.97(h) that is used in the statistical method shall be the lowest concentration level 		40 <i>CFR</i> § 264.97(i)(5) TDEC 0400-12-01-.06(6)(h)(9)(v)

Table G-8. Action-specific ARARs and TBC Guidance (Environmental Monitoring Requirements – All Phases) for CERCLA Waste Disposal, On-site Disposal Alternatives (Continued)

Action	Requirements	Prerequisite	Citation
	that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.		
	<ul style="list-style-type: none"> If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data. 		40 <i>CFR</i> § 264.97(i)(6) TDEC 0400-12-01-.06(6)(h)(9)(vi)
Detection monitoring	Must monitor for specified indicator parameters, waste constituents or reaction products that provide a reliable indication of the presence of hazardous constituents in groundwater.	Operation of a detection monitoring program under 40 <i>CFR</i> § 264.98— applicable	40 <i>CFR</i> § 264.98(a) TDEC 0400-12-01-.06(6)(i)(1)
	Must install a groundwater monitoring system at the compliance point as specified under 40 <i>CFR</i> § 264.95 that complies with 40 <i>CFR</i> § 264.97(a)(2) and (c).		40 <i>CFR</i> § 264.98(b) TDEC 0400-12-01-.06(6)(i)(2)
	Must conduct a monitoring program for each specified chemical parameter and hazardous constituent.		40 <i>CFR</i> § 264.98(c) TDEC 0400-12-01-.06(6)(i)(3)
	Sampling frequency shall be sufficient to determine whether there is statistically significant evidence of contamination.		40 <i>CFR</i> § 264.98(d) TDEC 0400-12-01-.06(6)(i)(4)
	Must determine the groundwater flow rate and direction in the uppermost aquifer annually at a minimum.		40 <i>CFR</i> § 264.98(e) TDEC 0400-12-01-.06(6)(i)(5)
	Must determine whether there is statistically significant evidence of contamination of any specified chemical parameter or hazardous constituent at a specified frequency.		40 <i>CFR</i> § 264.98(f) TDEC 0400-12-01-.06(6)(i)(6)
	If there is statistically significant evidence of contamination at any monitoring well at the compliance point, must follow the substantive provisions of this subsection [§264.98(g)].		40 <i>CFR</i> § 264.98(g) TDEC 0400-12-01-.06(6)(i)(7)
Surface water monitoring post-closure	Designated surface water course shall be sampled on a frequency of no less than once every six months after final closure of the disposal area.	Closure of a TSCA chemical waste landfill— applicable	40 <i>CFR</i> 761.75(b)(6)(i)(C)

Table G-9. Action-specific ARARs and TBC Guidance (Closure and Post-closure Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives

Action	Requirements	Prerequisite	Citation
Decontamination/disposal of equipment	During the partial and final closure periods, all equipment, structures, etc. must be properly disposed of or decontaminated unless otherwise specified in §§ 264.197, 264.228, 264.258, 264.280 or § 264.310.	Closure of a RCRA landfill— applicable	40 CFR 264.114 TDEC 0400-12-01-.06(7)(e)
Closure of RCRA landfill and other RCRA hazardous waste management units	Must close the unit in a manner that: (a) Minimizes the need for further maintenance; and (b) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and (c) Complies with the closure requirements of this part, including, but not limited to, the requirements of §§264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 264.351, 264.601 through 264.603, and 264.1102.	Closure of a RCRA hazardous waste management facility— applicable	40 CFR 264.111 TDEC 0400-12-01-.06(7)(b)
Closure of RCRA landfill	Must cover the landfill or cell with a final cover designed and constructed to: (1) Provide long-term minimization of migration of liquids through the closed landfill; (2) Function with minimum maintenance; (3) Promote drainage and minimize erosion or abrasion of the cover; (4) Accommodate settling and subsidence so that the cover's integrity is maintained; and (5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.	Closure of a RCRA hazardous waste management landfill— applicable	40 CFR 264.310(a) TDEC 0400-12-01-.05(14)(k)
Clean closure of a RCRA container storage area	Must remove all hazardous waste and residues from containment system. Remaining containers, liners, bases and soil containing or contaminated with hazardous waste or residues must be decontaminated or removed.	Management of RCRA hazardous waste in a container storage area— applicable	40 CFR 264.178 TDEC 0400-12-01-.06(9)(i)
Clean closure of TSCA storage facility	A TSCA/RCRA storage facility closed under RCRA is exempt from the TSCA closure requirements of 40 CFR 761.65(e).	Closure of TSCA/RCRA storage facility— applicable	40 CFR 761.65(e)(3)
Closure of groundwater monitoring well(s)	Shall be accomplished by a licensed driller.	Permanent plugging and abandonment of a well— relevant and appropriate	TDEC 0400-45-09-.16(2)
	Shall be completely filled and sealed in such a manner that vertical movement of fluid either into or between formation(s) containing groundwater classified pursuant to rule 0400-45-06-.05(1) through the bore hole is not allowed.		TDEC 0400-45-06-.09(6)(d)

**G-9. Action-specific ARARs and TBC Guidance (Closure and Post-closure Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives
(Continued)**

Action	Requirements	Prerequisite	Citation
	<p>Shall be performed in accordance with the provisions for Seals at 0400-45-06-(6)(e), (f), and (g); for Fill Materials at 0400-45-06-.09(6)(h) and (i); for Temporary Bridges at 0400-45-06-.09(6)(j); for Placement of Sealing Materials at 0400-45-06-.09(7)(a) and (b); and Special Conditions at 0400-45-06-09(8)(a) and (b), as appropriate.</p>		<p>TDEC 0400-45-06-.09(6)(e) through (j) TDEC 0400-45-06.09(7) TDEC 0400-45-06.09(8)(a) TDEC 0400-45-06.09(8)(b)</p>
<p>Closure of a RCRA tank system</p>	<p>Must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.) contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste, unless 40 CFR 261.3(d) (TDEC 0400-12-01-.02[1][c][4]) applies. If all contents cannot be practicably removed or decontaminated, consider the tank system a landfill and close in accordance with the landfill closure requirements of 40 CFR 264.310 (TDEC 0400-12-01-.06[14][k]).</p>	<p>Closure of a RCRA hazardous tank system—relevant and appropriate if wastewater is determined to be hazardous</p>	<p>40 CFR 264.197(a) and (b)TDEC 0400-12-01-.06(10)(h)(1) and (2)</p>
<p>Closure and post-closure care of a surface impoundment</p>	<p>Must remove or decontaminate all waste residues and contaminated materials; otherwise free liquids must be removed, the remaining wastes stabilized to a bearing capacity sufficient to support final cover, and the facility closed and covered with a final cover designed in accordance with 40 CFR 264.228(a)(2)(iii)(A)-(E) (TDEC 0400-12-01-.06[11][i][1][ii][III]).</p> <p>If some waste residues or contaminated materials are left in place at final closure, must comply with all postclosure requirements contained in §§264.117 through 264.120 (TDEC 0400-12-01-.06[7][h] through [k]), including maintenance and monitoring throughout the postclosure period. Must also:</p> <ul style="list-style-type: none"> • maintain integrity and effectiveness of final cover, making repairs to the cap as necessary; • maintain and monitor leak detection system; • maintain and monitor groundwater monitoring system; • prevent run-on and runoff from eroding or otherwise damaging final cover. 	<p>Closure of a hazardous waste surface impoundment—relevant and appropriate if wastewater is determined to be hazardous</p>	<p>40 CFR 264.228(a) and (b) TDEC 0400-12-01-.06(11)(i)(1) and (2)</p>

**G-9. Action-specific ARARs and TBC Guidance (Closure and Post-closure Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives
(Continued)**

Action	Requirements	Prerequisite	Citation
Survey plat	Must submit to the local zoning authority or the authority with jurisdiction over local land use, a survey plat indicating the location and dimensions of landfill cells, with respect to permanently surveyed benchmarks. The plat must contain a note, prominently displayed which states the owner/operator obligation to restrict disturbance of the landfill.	Closure of a RCRA landfill— applicable	40 CFR 264.116 TDEC 0400-12-01-.06(7)(g)
	Within 60 days of a site becoming inactive and after the effective date of this subpart, record, in accordance with State law, a notation on the deed to the facility property and on any other instrument that would normally be examined during a title search; this notation will in perpetuity notify any potential purchaser of the property that: (1) The land has been used for the disposal of asbestos-containing waste material; (2) The survey plot and record of the location and quantity of asbestos-containing waste disposed of within the disposal site required in §61.154(f) have been filed with the Administrator; and (3) The site is subject to 40 CFR part 61, subpart M.	Closure of an asbestos-containing waste disposal site— applicable	40 CFR 61.151(e)
Duration	Post closure care must begin after closure and continue for at least 30 years after that date.	Closure of a RCRA landfill— applicable	40 CFR 264.117(a) TDEC 0400-12-01-.06(7)(h)
Protection of facility	Post-closure use of property must never be allowed to disturb the integrity of the final cover, liners, or any other components of the containment system or the facility's monitoring system unless necessary to reduce a threat to human health or the environment.		40 CFR 264.117(c) TDEC 0400-12-01-.06(7)(h)(3)
Post-closure plan	Must have a written post-closure plan which identifies planned monitoring activities and frequency at which they will be performed for groundwater monitoring, containment systems and cap maintenance.		40 CFR 264.118 TDEC 0400-12-01-.06(7)(i)
Post-closure notices	Must submit to the local zoning authority a record of the type, location, and quantity of hazardous wastes disposed of within each cell of the unit.		40 CFR 264.119(a) TDEC 0400-12-01-.06(7)(j)(1)
Survey plat	Must record, in accordance with State law, a notation on the deed to the facility property - or on some other instrument which is normally examined during a title search - that will in perpetuity notify any potential purchaser of the property that the land has been used to manage hazardous wastes, and its use is restricted.		40 CFR 264.119(b) TDEC 0400-12-01-.06(7)(j)(2)

**G-9. Action-specific ARARs and TBC Guidance (Closure and Post-closure Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives
(Continued)**

Action	Requirements	Prerequisite	Citation
General post-closure care	<p>After final closure, owner or operator must:</p> <ul style="list-style-type: none"> (i) Maintain the effectiveness and integrity of the final cover including making repairs to the cap as necessary to correct effects of settling, erosion, etc.; (ii) Continue to operate the leachate collection and removal system until leachate is no longer detected; (iii) Maintain and monitor the leachate detection system in accordance with 40 CFR 264.301(a)(3)(iv) and (4) and 40 CFR 264.303(c); (iv) Maintain and monitor a groundwater monitoring system and comply with all other applicable provisions of 40 CFR 264, Subpart F; (v) Prevent run-on and run-off from eroding or otherwise damaging final cover; and (vi) Protect and maintain surveyed benchmarks used to locate waste cells. 		40 CFR 264.310(b) TDEC 0400-12-01-.06(14)(k)(2)
LLW disposal facility pre-closure activities	<p>Prior to closure of the disposal site, the following information will be obtained:</p> <ul style="list-style-type: none"> • Any additional geologic, hydrologic, or other disposal site data pertinent to the long-term containment of emplaced radioactive wastes obtained during the operation period. • The result of tests, experiments or other analyses relating to backfill of excavated areas, closure and sealing, waste migration and interaction with emplacement media, or any other test, experiments or analysis pertinent to the long-term containment of emplaced waste within the disposal site. • Any proposed revision of plans for decontamination and/or dismantlement of surface operational facilities, backfilling of excavated areas, or stabilization of the disposal site for postclosure care. • Any significant new information regarding the environmental impact of closure activities and long-term performance of the disposal site. 	Closure of a LLW disposal facility— relevant and appropriate	TDEC 0400-20-11-.12(1)
Closure of a LLW landfill	Covers must be designed to minimize to the extent practicable water infiltration, to direct percolating or surface water away from the disposed waste and to resist degradation by surface geologic processes and biotic activity.	Closure of a LLW disposal landfill— relevant and appropriate	TDEC 0400-20-11-.17(2)(d)
Closure of an asbestos-containing waste disposal area	Upon closure, comply with the provisions of 40 CFR 61.151(a) – (c)[TDEC 1200-3-11-.02(2)(l)(1) – (3)]:	Closure/capping of a permitted asbestos disposal site— relevant and appropriate	40 CFR 61.154(g) TDEC 1200-3-11-.02(5)(g)
	Must either discharge no visible emissions to the outside air; <u>or</u>		40 CFR 61.151(a)(1) TDEC 1200-3-11-.02(2)(l)(1)(i)
	Cover the ACM with at least 6 in. of compacted non-asbestos-containing material and grow and maintain a cover of vegetation on the area adequate to prevent exposure of the asbestos-containing waste; <u>or</u>		40 CFR 61.151(a)(2) TDEC 1200-3-11-.02(2)(l)(1)(ii)

**G-9. Action-specific ARARs and TBC Guidance (Closure and Post-closure Requirements) for CERCLA Waste Disposal, On-site Disposal Alternatives
(Continued)**

Action	Requirements	Prerequisite	Citation
	Cover the asbestos-containing waste with at least 2 ft of compacted non-asbestos-containing material and maintain it to prevent exposure of the waste.		40 CFR 61.151(a)(3) TDEC 1200-3-11-.02(2)(1)(1)(iii)
	Unless a natural barrier adequately deters access by the general public, install and maintain warning signs and fencing as detailed in 40 CFR 61.151(b)(1) – (3) <u>or</u> comply with 40 CFR 61.151(a)(2) or (a)(3).		40 CFR 61.151(b) TDEC 1200-3-11-.02(2)(1)(2)
	Owner may use an alternative control method that has received prior approval of the Administrator rather than comply with the requirements of 40 CFR 61.151(a) or (b).		40 CFR 61.151(c) TDEC 1200-3-11-.02(2)(1)(3)

Table G-10. Action-specific ARARs and TBC Guidance for Operation of an On-site Landfill Wastewater Treatment System, On-site Disposal Alternatives

Action	Requirements	Prerequisite	Citation
Release of landfill wastewater into Bear Creek tributary	Shall receive the degree of treatment or effluent reduction necessary to comply with water quality standards and, where appropriate, will comply with the “Standard of Performance” as required by TN Water Quality Control Act at TCA §§69-3-101, et seq. For industrial discharges without applicable federal effluent guidelines, best professional judgment should be employed to determine appropriate effluent limitations and standards.	Point source discharge(s) of pollutants into waters of the U.S. — applicable	TCA §§69-3-101 <i>et seq.</i> TDEC 0400-40-03-.05(6) TDEC 0400-40-05-.09(1)(b)
Non-continuous batch discharges (those discharges which are not continuous as defined in 40 CFR 122.2) of landfill wastewater	Non-continuous discharges shall be particularly described and limited, considering the following factors, as appropriate: <ul style="list-style-type: none"> • Frequency • Total mass • Maximum rate of discharge of pollutants during the discharge; and • Mass or concentration of specified pollutants 	Non-continuous discharge of pollutants to surface waters— applicable if water is released on a non-continuous batch basis rather than continuously	40 CFR 122.45(e) TDEC 0400-40-05-.08(1)(n)
Exclusion from 40 CFR 445 effluent discharge standards for RCRA Subtitle C landfills point source category	Pursuant to 40 CFR 445.1(e), RCRA Subtitle C landfills that only receive wastes generated by the industrial operations directly associated with the landfill are exempt from the CWA effluent standards under 40 CFR 445.11.	Point source discharge of wastewater from RCRA Subtitle C landfills [as defined in 40 CFR 445.2(f)] into waters of the U.S.— applicable	40 CFR 445.1(e)

Effluent discharge standards for RCRA Subtitle C landfills point source category

Any new source subject to this subpart must achieve the following effluent limitations which represent the application of best practicable control technology currently available (BPT):

Effluent Limitations

Regulated parameter	Maximum daily ¹	Maximum monthly avg. ¹
BOD5	220	56
TSS	88	27
Ammonia (as N)	10	4.9
α -Terpineol	0.042	0.019
Aniline	0.024	0.015
Benzoic acid	0.119	0.073
Naphthalene	0.059	0.022
p-Cresol	0.024	0.015
Phenol	0.048	0.029
Pyridine	0.072	0.025
Arsenic	1.1	0.54
Chromium	1.1	0.46
Zinc	0.535	0.296

Point source discharge of wastewater from RCRA Subtitle C landfills [as defined in 40 CFR 445.2(f)] into waters of the U.S.— **applicable**

40 CFR 445.14

Action	Requirements	Prerequisite	Citation
Temporary bypass of waste stream	Bypass is prohibited unless: <ul style="list-style-type: none"> • Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; • There were no feasible alternatives to bypass; condition not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance 	Bypass, as defined in TDEC 0400-40-05-.02(15), of waste stream— applicable	TDEC 0400-40-05-.07(2)(1)
	A bypass that doesn't cause effluent limitations to be exceeded may be allowed only if bypass is necessary for essential maintenance to assure efficient operation		TDEC 0400-40-05-.07(2)(m)
Wastewater transferred by truck or pipeline to on-site on-ORR CWA-authorized WWTU	A user may not introduce into a wastewater facility any pollutant(s) which causes pass through or interference, and wastewater must meet the pretreatment standards and prohibitions [waste acceptance criteria and limits] set by the wastewater facility prior to transfer.	Transfer of contaminated wastewater to a CWA-authorized wastewater facility for treatment— applicable	TDEC 0400-40-14-.05(1) – (2) and (4)

² The 40 CFR Part 445 requirements will be addressed in an FFA dispute currently underway in the water management FFS. Resolution of how this ARAR is addressed will occur prior to the Record of Decision and any ARAR s will be included in the final Record of Decision.

**Table G-10. Action-specific ARARs and TBC Guidance for Operation of an On-site Landfill Wastewater Treatment System, On-site Disposal Alternatives
(Continued)**

Action	Requirements	Prerequisite	Citation
Management of water generated from EMDF landfill	On-site wastewater treatment units that are part of a wastewater treatment facility subject to regulation under Section 402 or Section 307(b) of the CWA are exempt from the requirements of RCRA Subtitle C for all tank systems, conveyance systems (whether piped or trucked), and ancillary equipment used to store or transport RCRA contaminated water.	On-site wastewater treatment units subject to regulation under §402 or §307(b) of the CWA – applicable if water is determined to be hazardous	40 CFR 264.1(g)(6) 40 CFR 260.10 40 CFR 270.1(c)(2)(v) TDEC 0400-12-01-.07(1)(b)(4)(iv) 53 FR 34079, September 2, 1988
Disposal of wastewaters containing RCRA hazardous constituents	Disposal is not prohibited if the wastes are managed in a treatment system which subsequently discharges to waters of the U.S. under the CWA unless the wastes are subject to a specified method of treatment other than DEACT in 40 CFR 268.40 or are D003 reactive cyanide.	Disposal of RCRA restricted hazardous wastes that are hazardous only because they exhibit a hazardous characteristic and are not otherwise prohibited under 40 CFR 268 - applicable if water is determined to be hazardous	40 CFR 268.1(c)(4)(i) TDEC 0400-12-01-.10(1)(a)(3)(iv)(I)

Table G-11. Action-specific ARARs and TBC Guidance for CERCLA Waste Disposal, Off-site Disposal Alternative

Action	Requirements	Prerequisite	Citation
Construction and operation of a volume reduction facility (miscellaneous treatment facility)	Follow design and operating standards that ensure protection of human health and the environment for units in which hazardous waste is treated.	Processes involving treatment of RCRA hazardous waste in a miscellaneous unit as defined in 40 CFR 260.10— applicable to volume reduction facility	40 CFR 264.601 TDEC 0400-12-01-.06(27)(b)
	Prevent any releases that may have adverse effects on human health or the environment due to migration of waste constituents, specifically preventing adverse effects in: <ul style="list-style-type: none"> • the groundwater or subsurface environment • surface water, or wetlands, or the soil surface; • the air 		40 CFR 264.601(a) through (c) TDEC 0400-12-01-.06(27)(b)(1) through (3)
	A miscellaneous unit that is a disposal unit must be maintained in a manner that complies with §264.601 during the post-closure care period. In addition, if a treatment or storage unit has contaminated soils or groundwater that cannot be completely removed or decontaminated during closure, then that unit must also meet the requirements of §264.601 during post-closure care. The post-closure plan under §264.118 must specify the procedures that will be used to satisfy this requirement.		40 CFR 264.603 TDEC 0400-12-01-.06(27)(d)
Transportation of hazardous materials	Shall be subject to and must comply with all applicable provisions of the HMTA and HMR at 49 CFR 171-180.	Any person who, under contract with a department or agency of the federal government, transports "in commerce", or causes to be transported or shipped, a hazardous material— applicable	49 CFR 171.1(c)
Transportation of hazardous and radioactive materials off-site	The waste must meet packaging, labeling, marking, placarding and pre-transport requirements in accordance with DOT regulations.	Transportation of hazardous and radioactive materials above exempt quantities— applicable	49 CFR 171, 172, 173, 174, 177, 178, and 179
	Must meet packaging requirements based on the maximum activity of radioactive material in a package.	Packaging of radioactive materials above exempt quantities for public transport— applicable	49 CFR 173.431 49 CFR 173.433 49 CFR 173.435 49 CFR 173.411
Transportation of LLW off-site	LLW waste shall be packaged and transported in accordance with DOE O 1460.1D and DOE O 460.2A.	Preparation of off-site shipment of LLW— TBC	DOE M 435.1-1(I)(1)(E)(11)
	To the extent practicable, the volume of waste and number of shipments shall be minimized.		DOE M 435.1-1(IV)(L)(2)
Transportation of PCB wastes off-site	Must comply with the manifesting provisions at 40 CFR 761.207 through 218.	Relinquishment of control over PCB wastes by transporting, or offering for transport— applicable	40 CFR 761.207(a)

Table G-11. Action-specific ARARs and TBC Guidance for CERCLA Waste Disposal, Off-site Disposal Alternative (Continued)

Action	Requirements	Prerequisite	Citation
Transportation of hazardous waste off-site	Must comply with the generator requirements of 40 CFR 262.20-23 for manifesting, Sect. 262.30 for packaging, Sect. 262.31 for labeling, Sect. 262.32 for marking, Sect. 262.33 for placarding, Sect. 262.41(a) for record keeping requirements, and Sect. 262.12 to obtain EPA ID number.	Off site transportation of RCRA hazardous waste— applicable	40 CFR 262.10(h) TDEC 0400-12-01-.03(1)(a)(8)
	Must comply with the requirements of 40 CFR 263.11-263.31. (Standards applicable to transporters of hazardous waste.)	Transportation of hazardous waste within the United States requiring a manifest— applicable	40 CFR 263.11 - 263.31
	A transporter who meets all applicable requirements of 49 CFR 171-179 and the requirements of 40 CFR 263.11 and 263.31 will be deemed in compliance with 40 CFR 263.	Transportation of hazardous waste within the United States requiring a manifest— applicable	40 CFR 263.10(a)
Transportation of hazardous waste on-site	The generator manifesting requirements of 40 CFR 262.20-262.32(b) do not apply. Generator or transporter must comply with the requirements set forth in 40 CFR 263.30 and 263.31 in the event of a discharge of hazardous waste on a private or public right-of-way.	Transportation of hazardous wastes on a public or private right-of-way within or along the border of contiguous property under the control of the same person, even if such contiguous property is divided by a public or private right-of-way— applicable	40 CFR 262.20(f)
Transportation of universal waste off-site	Off-site shipments of universal waste by a large quantity handler of universal waste shall be made in accordance with 40 CFR 273.38 (TDEC 0400-1-11-.12[3][i]).	Preparation of off-site shipments of universal waste by a large quantity generator of universal waste— applicable	40 CFR 273.38 TDEC 0400-1-11-.12(3)(i)
Transportation of used oil off-site	Except as provided in paragraphs (a) to (c) of this rule, generators must ensure that their used oil is transported by transporters who have obtained U.S. EPA ID numbers.	Preparation of off-site shipment of used oil by generators of used oil— applicable	40 CFR 279.24 TDEC 0400-1-11-.11(3)(e)

Tables G-2 through G-11 Acronyms

ACM = asbestos-containing material
ALARA = as low as reasonably achievable
ANOVA = analysis of variance
ARAP = aquatic resource alteration permit
ARAR = applicable or relevant and appropriate requirement
ARPA = Archaeological Resources Protection Act of 1979
CERCLA = Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFR = *Code of Federal Regulations*
CMBST = combustion
CWA = Clean Water Act of 1972
DEACT = deactivation
DOE = U.S. Department of Energy

DOE M = Radioactive Waste Management Manual
DOE O = U.S. Department of Energy Order
DOT = U.S. Department of Transportation
EMWMF = Environmental Management Waste Management Facility
EP = extraction procedure
EPA = U.S. Environmental Protection Agency
FEMA = U.S. Federal Emergency Management Agency
HMR = Hazardous Materials Regulations
HMTA = Hazardous Materials Transportation Act of 1975 (Amendments of 1976)
ID = identification number
LDS = leak detection system
LLW = low-level (radioactive) waste

NGS = National Geodetic Society
NRC = Nuclear Regulatory Commission
ORR = Oak Ridge Reservation
PCB = polychlorinated biphenyl
POLYM = polymerization
PPE = personal protective equipment
PQL = practical quantitation limit
RCRA = Resource Conservation and Recovery Act of 1976
RORGS = recovery of organics
SHPO = State Historic Preservation Officer
TBC = to be considered
TC = toxicity characteristic
TCA = Tennessee Code Annotated
TDEC = Tennessee Department of Environment and Conservation
T&E = threatened and endangered (species)
THPO = Tennessee Historic Preservation Officer
TN = Tennessee
TSCA = Toxic Substances Control Act of 1976
TWRA = Tennessee Wildlife Resources Agency
U.S. = United States
USC = *United States Code*
USGS = U.S. Geological Service
UTS = universal treatment standards
WWTU = wastewater treatment unit

9. REFERENCES

- Baranski M.L. 2009, *Natural Areas Analysis and Evaluation, Oak Ridge Reservation*. ORNL/TM-2009/201, Oak Ridge National Laboratory, November 2009, Oak Ridge TN.
- Collins, J. L. 2015. *Environmental Management Expanded Disposal Facility Project, Oak Ridge Reservation, Anderson County, Tennessee Assessment of Several Biological Resources of the Proposed Site, Including Site Vegetation; Presence of Rare, Threatened, or Endangered Plant, Vertebrate Animal, and Aquatic Animal Species; and Site Stream Assessment*.
- DOE 1992. *Federal Facility Agreement for the Oak Ridge Reservation*, U.S. Department of Energy, U.S. Environmental Protection Agency Region 4, and Tennessee Department of Environment and Conservation, DOE/OR-1014.
- DOE 1999. *Record of Decision for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste, Oak Ridge, Tennessee*, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN, DOE/OR/01-1791&D3, 1999.
- DOE 2005. *Record of Decision for Soil, Buried Waste, and Subsurface Structure Actions in Zone 2, East Tennessee Technology Park, Oak Ridge, Tennessee*, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN, DOE/OR/01-2161&D2, 2005.
- DOE 2012. *Oak Ridge Reservation Polychlorinated Biphenyl Federal Facilities Compliance Agreement*.
- DOE 2015. *Oak Ridge Reservation Annual Site Environmental Report for 2014*. DOE/ORO/2502, September, 2015.
- EPA 1988. *CERCLA Compliance with Other Laws Manual, Part I*, EPA/540/G-89/006, OSWER Directive 9234.1-01, August 8, 1988.
- EPA 1989a. *CERCLA Compliance with Other Laws Manual: Part II*. EPA/540/G-89/009, OSWER 9234.1-02, August, 1989.
- EPA 1989b. *Overview of ARARs Focus on ARAR Waivers*, OSWER 9234.2-03/FS, Environmental Protection Agency, Office of Solid Waste and Emergency Response, December 1989.
- EPA 1990a. "CERCLA Compliance with Other Laws Manual: Summary of Part II – CAA, TSCA, and Other Statutes," EPA OSWER Directive 9234.2-07/FS, April, 1990.
- EPA 1990b. "TSCA Landfill Inspection Guidance Manual," March 1990, Chicago, IL.
- EPA 1991. *ARARs Q's & A's: General Policy, RCRA, CWA, SDWA, Post-ROD Information, and Contingent Waivers*. Publication 9234.2-01/FS-A Office of Solid Waste and Emergency Response, July 1991. EPA, Washington, D.C.
- EPA 1992a. "ARARs Fact Sheet: Compliance with the Clean Air Act and Associated Air Quality Requirements," EPA Publication 9234.2-22FS, September, 1992.

- EPA 1992b. "Guide to Management of Investigation-Derived Wastes," EPA OSWER Directive 9345.3-03FS, January, 1992.
- EPA 1995. *Clarification of NPL Listing Policy. Memorandum from Stephen D. Luftig, Acting Director, Office of Emergency and Remedial Response to Division Directors*, August 4, 1995. EPA, Washington, DC.
- EPA 1997. *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination*, OSWER No. 9200.4-18, U.S. Environmental Protection Agency, August 22, 1997, Washington, D.C.
- EPA 2000. *Development Document for Final Effluent Limitations Guidelines and Standards for the Landfills Point Source Category*. EPA-821-R-99-019.
- National Academy Press 2001. *A Risk-Management Strategy for PCB-contaminated Sediments*; Chapter 2 - PCBs in the Environment.
- NRC 1981. *Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste"*, NUREG-0782, Volumes 1-4, U.S. Nuclear Regulatory Commission, September 1981.
- NRC 1982. *Final Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste"*, NUREG-0945, Volumes 1-2, U.S. Nuclear Regulatory Commission, November 1982.
- TDEC 2009. *A Guide to the Rare Animals of Tennessee*, Tennessee Department of Environment and Conservation, March, 2009.
- TDEC 2012. *Tennessee Natural Heritage Program Rare Plant List*, Tennessee Department of Environment and Conservation, 2012.