

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

AUGUST 2014

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INTRODUCTION

The Navy, as lead agency, is responsible for complying with Applicable or Relevant and Appropriate Requirements (ARARs) for Environmental Restoration site response actions conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program. This toolkit provides Remedial Project Managers (RPMs) with exhibits and tables that convey the process for selecting ARARs and how to navigate through the most common challenges. Failing to properly identify ARARs leaves the Navy open to liability; consequently, RPMs should engage Navy legal early in the ARARs process. This toolkit supplements the ARARs guidance and resources presented in Exhibit 8.

ARARs are federal environmental or state environmental or facility siting laws and regulations that are identified when evaluating CERCLA removal or remedial actions. ARARs must be established for CERCLA actions because CERCLA provides exemptions from some aspects of environmental laws and regulations for activities conducted entirely on-site. Non-CERCLA actions and off-site CERCLA actions are subject to all aspects of laws and regulations. Therefore, ARARs are only developed for on-site CERCLA actions.

ARARs are typically first identified and negotiated with regulatory agencies in an Engineering Evaluation/ Cost Analysis or Feasibility Study. These preliminary ARARs are refined throughout the process to identify those chemical-, location-, and action-specific environmental laws and regulations pertinent to removal or remedial activities that will become legally binding when documented in a decision document (e.g., Action Memorandum, Record of Decision). ARARs are critical to the CERCLA process because they:

- Assist in developing removal or remedial action objectives
- Are a distinguishing threshold criterion for selecting the remedial action that must be met (unless a waiver is justified)
- Establish the action- or location-specific requirements for how or when to conduct specific elements of the action
- · May establish criteria for identifying when the response is complete

This toolkit consists of eight graphical exhibits containing key information to aid in outlining the key concepts in identifying and documenting ARARs. The exhibits are intended to be examples only and are not allencompassing. The exhibits in this toolkit focus on federal ARARs. Many states have additional, equally enforceable, and more stringent requirements that may also pertain to response actions.

This toolkit provides an overview on the topic of ARARs and does not supersede existing installation-(e.g., Naval Station Newport) or command-specific (e.g., NAVFAC SW) templates or procedures and should not be misconstrued as legal advice. The RPM must be aware that each site is unique and will present its own unique set of applicable and relevant and appropriate standards; this toolkit is not intended to be the sole template used for ARAR identification. Consult Navy legal for questions and clarifications.

This toolkit is designed to be viewed electronically. This format allows the reader to zoom into the detail presented in the color graphics. Please note that some reformatting may be required for printing.

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EXHIBIT 1	WHAT IS THE PROCESS FOR IDENTIFYING AND DEVELOPING APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)?
EXHIBIT 2	WHAT IS THE DIFFERENCE BETWEEN ON-SITE VS. OFF-SITE ACTIONS?
EXHIBIT 3	WHAT IS THE DIFFERENCE BETWEEN AN APPLICABLE ARAR AND A RELEVANT AND APPROPRIATE ARAR?
EXHIBIT 4	WHAT ARE SUBSTANTIVE AND ADMINISTRATIVE REQUIREMENTS?
EXHIBIT 5	WHAT ARE CHEMICAL-, LOCATION-, AND ACTION-SPECIFIC ARARS?
EXHIBIT 6	WHAT ARE TO-BE-CONSIDERED (TBC) CRITERIA?
EXHIBIT 7	WHY IS IT IMPORTANT TO BE SPECIFIC WHEN CITING ARARS?
EXHIBIT 8	RESOURCES
ATTACHMENT	TABLES OF EXAMPLES OF COMMON CHEMICAL-, LOCATION-, AND ACTION-SPECIFIC ARARS



enforceable

selected, defining more specific citations or deleting any superfluous information, and/ or updating any regulatory changes.

All ARARs tables, regardless of the phase of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, must be reviewed by the RPM and Navy legal prior to submittal to the regulators. This can eliminate unnecessary discussion and dispute.

Note

As part of the FS or **EE/CA review process**, the lead agency proposes draft ARARs to federal and state agencies for review

Junit 2—Paradise Creek Disposal Arez Soil and Sediment

Federal and state agencies review and provide input on draft ARARs

> Lead agency and federal and state agencies negotiate final ARARs



EXHIBIT 2. WHAT IS THE DIFFERENCE BETWEEN ON-SITE VS. OFF-SITE ACTIONS?

Citation: 40 CFR 300.5 and 40 CFR 300.400

Definitions:

On-site is considered "the areal extent of contamination and all suitable areas in very close proximity to the contamination that are necessary for implementation of the action." Defining "in very close proximity" is flexible and should be determined in accordance with best professional judgement and negotiated with regulatory agencies. ARARs identify the regulatory requirements that must be met for on-site remedial actions.

Off-site is considered any area not on-site or in very close proximity to the site where activities associated with implementing the action take place. It is not necessary to identify ARARs for any actions conducted off-site because all laws and regulations apply in the normal manner to off-site actions.

The two scenarios below illustrate the ARAR implications for on-site vs. off-site actions.



This scenario illustrates a site where a dredging remedial action is taking place. For this action, onsite includes the areal extent of contamination, including the area located outside of the installation boundary, and the waste treatment area that is in very close proximity. The waste staging area was determined by stakeholders not to be in very close proximity and is considered off-site. ARARs would need

to be developed for the dredging and treatment of spoils in the waste treatment area. Waste staged at the waste staging area is not considered "on-site" and is subject to all applicable laws and regulations in the normal fashion; therefore, ARARs should not be developed.

Scenario 2. Central Waste Staging Area



This scenario illustrates an installation with a central waste staging area. Negotiations were conducted with the cleanup team, including regulatory agencies, to establish on-site and offsite areas. These negotiations resulted in the following:

- The waste staging area is considered <u>on-site</u> for Site 78 because it is located within the areal extent of contamination.
- The waste staging area is considered <u>on-site</u> for Site 96 because it is located <u>in very close proximity</u>.
- The waste staging area is considered <u>off-site</u> when receiving wastes generate from other sites (Sites 6, 82, and 88).

ARARs would need to be developed for the waste staging activities for Sites 78 and 96 whereas staging wastes generated from Sites 6, 82, and 88 would be subject to all applicable laws and regulations.

EXHIBIT 3. WHAT IS THE DIFFERENCE BETWEEN AN APPLICABLE ARAR AND A RELEVANT AND APPROPRIATE ARAR?

Citation: 40 CFR 300.400(g) and 40 CFR 300.5

Definitions:

Applicable requirements are clean-up standards, standards of control, and other substantive environmental protection requirements, criteria, or limits promulgated under federal or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance.

Relevant and appropriate requirements are clean-up standards, standards of control, and other substantive environmental protection requirements, criteria, or limits promulgated under federal or state law that, although not applicable to a hazardous substance, a pollutant, a contaminant, a remedial action, or other circumstances at a CERCLA site, address problems or <u>situations sufficiently similar</u> to those encountered at the CERCLA site so that their <u>use is</u> well suited to the particular site.

The two scenarios below illustrate the rationale for determining if an ARAR is applicable or relevant and appropriate.

ARARS PROCESS

To identify which laws and regulations are ARARs, use the following process:

Determine if the requirement is promulgated; enforceable; and if a state requirement, more stringent. If not, the requirement is not an ARAR but may be a to-be-considered criterion (see Exhibit 6). Determine if the requirement is directly applicable to the on-site condition or activity. Applicable requirements are those laws and regulations that specifically address a situation at a CERCLA site.

If the requirement is not applicable; determine whether it is relevant AND appropriate. Relevant and appropriate requirements are those laws and regulations that may be well suited to address sufficiently similar situations at a CERCLA site.

Example 1. Erosion and Sediment Control Requirements

Scenario	Requirement	Applicable	Relevant and Appropriate	Explanation
Area of land disturbance <1 acre	Stormwater Pollution Prevention Plan	No	Maybe	Developing a Stormwater Pollution Prevention Plan may be relevant and appropriate to retain contaminated soil on-site
Area of land disturbance ≥1 acre	Stormwater Pollution Prevention Plan	Yes	No	Disturbing ≥1 acre of land requires development and implementation of a Stormwater Pollution Prevention Plan



<1-acre Disturbance

>1-acre Disturbance

Example 2. Solid Waste Landfill Requirements

Scenario	Requirement	Applicable	Relevant and Appropriate	Explanatio
Disposal occurred	Cover	No	No	
after solid	Сар	Yes	No	Permitted landfill requ
waste regulations; landfill permitted	Post-closure care	Yes	No	constructed cap and p care requirements mu
	Cover	Yes	No	Waste must be covere protect human health environment
Disposal pre-dates solid waste regulations;	Сар	No	Maybe	Caps are always releved disposal areas; howeved would only be appropri- high-risk circumstance chemical agent was d
landfill never permitted	Post-closure care	No	Maybe	Post-closure care is o required at permitted Under CERCLA, conti protectiveness of the managed and evaluat a long-term monitoring Five-Year Review pro-

If the requirement is applicable or relevant and appropriate, the requirement is an ARAR.

Note

Identifying a law or regulation as an ARAR in a Decision Document makes it enforceable. Properly identifying ARARs avoids unnecessary Decision Document revisions.

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landfills. tinued remedy is ted through g program/ ocess.



Disposal Pre-dates Solid Waste Regulations



Permitted Landfill

EXHIBIT 4. WHAT ARE SUBSTANTIVE AND ADMINISTRATIVE REQUIREMENTS?

Citation: 55 FR 8756-57 and 40 CFR 300.5

Definitions:

Laws and regulations have both substantive and administrative requirements.

Substantive requirements are those aspects of a law or regulation that you must do and/or accomplish during the action. They typically specify numerical levels or control standards that the action is required to meet.

Administrative requirements are those aspects of a law or regulation that help implement the substantive requirements. CERCLA provides exemptions from administrative aspects of laws and regulations for on-site actions (e.g., procedural, documentation, permitting, and administrative reviews).

The scenario below illustrates substantive and administrative requirements for a response action.

Scenario: Soil excavation and treatment of groundwater via injection of oil substrate to achieve unlimited use/unrestricted exposure



Activity:	Law/Regulation:	Substantive Requirement (ARARs):	Administrative Requirement (Not ARARs):
Establishing groundwater cleanup levels	Safe Drinking Water Act Standards	Achieve Maximum Contaminant Levels (MCLs)	Definitions and applicability statements
Working within a migratory flyway	Migratory Bird Treaty Act	Do not take birds nests or eggs	Applying for a permit to take birds nests or eggs
Performing in situ groundwater	Underground Injection	Construct and operate wells in accordance with injection well	Obtaining UIC permit and/or submitting notification
treatment	Control (UIC)	construction requirement Do not impact drinking water sources	State review and approval of designs
Ormanations		Maintain containers in good condition	Obtain a generator number
Generating remediation- derived waste	Waste Management in Containers	Meet waste labeling requirements	State review and approval of location and design of staging area
		Design and location of staging area	Waste inventory reporting
		Meet discharge limits	Obtain a water discharge permit
Dewatering from a soil excavation	Water Discharge Requirements	Develop/implement plans or designs as needed	Reporting requirements
		Conduct equipment maintenance	P.E. or P.G. certifications

These substantive and administrative requirements are examples only and may differ by state or the site-specific situation.

Note

Differentiating administrative and substantive requirements may be open to interpretation, consult with Navy legal for assistance.

EXHIBIT 5. WHAT ARE CHEMICAL-, LOCATION-, AND ACTION-SPECIFIC ARARS?

Citation: 55 FR 8756-57

Definitions:

Chemical-, location-, and action-specific ARARs are site-specific substantive requirements to be met for removal and remedial actions. ARARs are limited to environmental and facility siting laws and regulations and exclude all others (e.g., Occupational Safety and Health Administration [OSHA] regulations)¹. See Exhibit 6 for information on to-be-considered (TBC) criteria.

Chemical-specific ARARs are usually numerical values that establish the treatment and discharge standards for the removal or remedial action and cleanup levels for the media posing unacceptable human health or ecological risks at the site. Location-specific ARARs prevent damage to unique or sensitive areas, such as floodplains, historic places, wetlands, and fragile ecosystems, and restrict other activities that are potentially harmful because of where they take place. Action-specific ARARs are activity or technology based and control removal or remedial activities involving the design or use of certain equipment, or regulate discrete actions.

Examples of common chemical-, location-, and action-specific ARARS for soil, groundwater, sediment, and non-aqueous phase liquid are provided in the attached tables.

Chemical-Specific ARARs

ARAR: Maximum Contaminant Levels (MCLs)

Citation: 40 CFR 141.61 and 40 CFR 141.62

Requirement: Ensures existing or potential sources of drinking water do not exceed Safe Drinking Water Act (SDWA) MCLs for organic and inorganic contaminants. Applicable to community and non-transient, non-community water systems.

lication: If ground-	Contaminant	MCL (mg/L)
er is classified as a	(1) Fluoride	. 4.0
ntial drinking water	(2) Asbestos	7 Million Fibers/liter
ce or the state		(longer than 10 μm).
siders all groundwater	(3) Barium	2
beneficial use,	(4) Cadmium	0.005
nup levels must be	(5) Chromium	0.1
at MCLs. Potable	(6) Mercury	0.002
of groundwater	(7) Nitrate	10 (as Nitrogen)
t be prevented and	(8) Nitrite	1 (as Nitrogen)
	(9) Total Nitrate and Nitrite	10 (as Nitrogen)
ndwater treated and/	(10) Selenium	0.05
nonitored until MCLs	(11) Antimony	0.006
net.	(12) Beryllium	0.004
	(13) Cyanide (as free Cyanide).	0.2
	(14) [Reserved].	
	(15) Thallium	
	(16) Arsenic	0.010

Location-S	oecific	ARARs
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ARAR: Migratory Bird Treaty Act (MBTA)

Citation: 16 USC 703

Requirement: Protects over 800 species of birds from unregulated taking.

Implication: MBTA is almost always an ARAR because every area within the United States is located within a migratory flyway. It protects almost every bird species native to the United States; therefore, if a contractor finds a bird nesting on your site, STOP WORK until you can determine if the bird is protected. Contact natural resources personnel at NAVFAC and/or Base Environmental for more information. There are criminal penalties for non-compliance.



Black Vulture Hatchling



Killdeer Bird Eggs

Action-Specific ARARs

Citation: 40 CFR 144.1(g), 144.6, 144.12(a) and (c), 144.24(a), 144.82, 144.83, 146.8, 146.10(c)

abandonment.

Implication: Depending on the type of substrate being injected, UIC regulations provide minimum requirements for six different classes of injection wells. Recognize which classification applies to your site and implement the requirements.



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The ARARs tables included in Action Memorandums or Decision Documents contain mandatory requirements that must be carried through the design and implementation of the removal or remedial action. RPMs should ensure any follow-on contract actions include these requirements and that quality control is conducted to ensure compliance with the ARARs.

¹Consult Navy legal when considering other laws and regulations that are not ARARs.

Note

Ensure that ARARs are pertinent before including them in the table. For example, before including the Endangered Species Act in the table, determine whether threatened or endangered species are present on your site. If you are uncertain whether a specific requirement should be included, consult with Navy legal.

ARAR: Underground Injection Control (UIC)

Requirement: Regulates the subsurface injection of fluids, including air, (e.g., in situ groundwater treatment) to prevent contamination of underground sources of drinking water. Provides the minimum requirements for well construction, well operation, monitoring, and

Well Installation

Groundwater Injection

EXHIBIT 6. WHAT ARE TO-BE-CONSIDERED (TBC) CRITERIA?

Citation: 40 CFR 300.400 (g)(3)

Definition:

To-be-considered (TBC) criteria are not enforceable and include advisories, guidance, industry operating standards, and/or Executive Orders that are useful in developing a remedial or removal action or to clarify aspects of the action. TBC criteria may be included if appropriate for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) actions.

There is no universal list of accepted TBCs. TBCs can vary by EPA and Navy region; some examples are:

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US EPA Reploy 3 Besid

Engineers Delineation Manual

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- Cap design guidance •
- Corps of Engineers Wetlands Delineation Manual •
- EPA groundwater classification guidance
- Executive Orders (e.g., floodplain management, protection of wetlands) •

are

endangered

before

The RPM should

counsel

- Health advisories (e.g., manganese)
- Non-promulgated screening levels

TITLE 20 Fish and Wildlife

CHAPTER 20-37

SECTION 20-37-1

THE WHITE HOUSE EXECUTIVE ORDER 11990

PROTECTION OF WETLANDS

Because the federal government

has sovereign immunity, not all promulgated state laws/regulations

apply to the federal government.

promulgated, they are not TBC but may be relevant and appropriate requirements for the action (e.g.,

state

concluding that a waiver does or does

Since these laws/regulations

consult

als and Plants

v May 24, 1977

Vapor intrusion guidance

DOD VAPOR INTRUSION

HANDBOOK

Endangered Sp

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e authority vested in me by the Constitution and statul as President of the United States of America, in furthe 1 Policy Act of 1969, as amended (42 U.S.C. 4321 et s

Hinney of Section. (P.L. 1973, ch. 26, § 1, P.L. 1977, ch. 173, § 1.)

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species laws).

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\$EPA

Guidelines for

Ground-Water

Classification under the EPA Ground-Water

Protection Strategy

Final Draft

TBCs only become enforceable when signed into a Final Decision Document (e.g., Record of Decision, Action Memorandum). TBCs are not required to be included in an ARARs table and should be carefully considered before adding them. For example, if a screening level is identified in a Decision Document as the cleanup level, that non-promulgated screening level then becomes enforceable.

Executive Order 11988----Fic

Source: The provisions of Executive Order 11928 of May 24, 1977, appear at 42 FR 26951, 3 CFR, 1977 Comp. p. 117, unless otherwise noted.

2001. J CFR. 1977 Comp. p. 117, unless otherwise noted. By virtue of the authority vested in me by the Constitution and state. States or Duited States of Authority Authority Authority (2010) fination of 1968, as amended (2010) finational Environmental Policy Flood Disaster Protocilon Act of 1961 (2010) Flood Disaster Protocilon Act of 1967 (2010) Flood Disaster Protocilon Act of 1

incut evidences intere is a practicable asternative, it is meredo of follows: iscrinos 1. Each agency shall provide leadership and shall human safety, health and vielare, and tominize the impact of fit used and beneficial value wildre, and tomestore and preserve vasibilities for (1) acquires served by floodplains in carrying on stand facilities; (2) proving, managing, administration of the is and facilities; (2) proving, managing, administration of the is and presents; (2) proving, managing, administration, financed, of d construction and improvements, and (3) inducting Federal et and related land resources planning, regulating, and licensing et. on hu lake

water and retated tand resources planning, regulating, and licensing itvities. Set: 2. In carrying out the activities described in Section 1 of Order, each Agency has a responsibility to evaluate the potential of plagrams and budger request reflect considering the section of any policies and requirement and to prescribe protoin of fload hazard policies and requirement and to prescribe protoin of fload hazard policies and requirement and to prescribe protoin of fload the proposed action, each agencian. And the fload the fload the proposed action, each agencian fload the formation for the section, activity and the fload the fload the fload the fload evaluation of the quality of the human environment This Detection 102(2) (C) or the section of the proposed section will be included in section of the section o

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LANDFILL TECHNICAL GUIDANCE MANUAL

REVISED MAY, 1997

the in alternate formately reasons any reasons the transformation and the reasons and the reasons any reasons the reasons and the reasons and

OFFICE OF ENVIRONMENTAL AFFAIRS ment of Environmental Protection on of Solid Waste Management

Inappropriately citing TBCs can result in significant cost or schedule impacts during the design and implementation phase. For example, citing cap design guidance when only a soil cover remedy is required.

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EXHIBIT 7. WHY IS IT IMPORTANT TO BE SPECIFIC WHEN CITING ARARS?

ARAR citations should be as specific and precise as possible because not all aspects of the law or regulation may be an ARAR. For example, cite the specific subsection of RCRA Subtitle D that contains the applicable or relevant and appropriate standard (e.g., 40 CFR Part 264.310(a)) rather than citing all of RCRA Subtitle D (e.g., 40 CFR Part 264).

The scenario below illustrates the importance of ARAR citation specificity.

Scenario: Closed landfill with three chemicals of concern (COCs) in groundwater ARARs identified in the Record of Decision (ROD): ARAR 1: All of RCRA Subtitle D ARAR 2: All Federal drinking water Maximum Contaminant Levels (MCLs)

ARAR 1: By identifying all RCRA Subtitle D as an ARAR, all closure and post-closure care requirements must now be met. This can unnecessarily require long-term monitoring of the full constituent list of 40 CFR Part 258, Appendix II instead of just the COCs.





Preferred Citation: The only pertinent requirement from RCRA Subtitle D is RCRA cap performance standards. Therefore, the preferred citation is 40 CFR 258.61(a)(1) which eliminates all inappropriate requirements from being incorporated into the remedy.

ARAR 2: By identifying all Maximum Contaminant Levels (MCLs) as an ARAR (40 CFR 141), regulators may try to assert all MCLs must now be met. This can unnecessarily require long-term monitoring for all the chemicals with an MCL instead of just the COCs.

141.61 Maximum contaminant levels for organic contaminants

(a) The following maximum contaminant levels for organic contaminants apply to community and non-transient, non-community water systems.

Citation	CAS No.	Contaminant	MCL (mg/l)
141.61(a)(1)	(1) 75-01-4	Vinyl chloride	0.002
141.61(a)(2)	(2) 71-43-2	Benzene	0.005
141.61(a)(3)	(3) 56-23-5	Carbon tetrachloride	0.005

Preferred Citation: The only pertinent requirements from 40 CFR 141 are the three listed COCs (vinyl chloride, benzene, and carbon tetrachloride). Therefore, the preferred citation is 40 CFR 141.61(a)(1), 141.61(a)(2), and 141.61(a)(3). Also add a note in the ARARs tables to list the COCs and their clean-up levels.

EXHIBIT 8. RESOURCES

Department of Defense (DoD), 2012. Defense Environmental Restoration Program (DERP) Manual. March.

Environmental Protection Agency (EPA), 1989. Applicability of Land Disposal Restrictions to RCRA and CERCLA Ground Water Treatment Reinjection Superfund Management Review: Recommendation No. 26. December.

EPA, 1990. ARARs Q's & A's: Compliance with Federal Water Quality Criteria. June.

EPA, 1990. ARARs Q's & A's: State Groundwater Antidegradation Issues. July.

EPA, 1990. CERCLA Compliance with Other Laws Manual: CERCLA Compliance with the Clean Water Act [CWA] and Safe Drinking Water Act [SDWA] (OSWER 9234.2-06). February.

EPA, 1990. CERCLA Compliance with Other Laws Manual. Part I. Interim Final. August.

EPA, 1991. ARARs Q's & A's: General Policy, RCRA, CWA, SDWA, Post-ROD Information and Contingent Waivers. July.

EPA, 1991. ARARs Q's & A's: Compliance with New SDWA National Primary Drinking Water Regulations for Organic and Inorganic Chemicals. August.

EPA, 1992. ARARs Fact Sheet. Compliance with the Clean Air Act and Associated Air Quality Requirements. September.

EPA, 1992. Permits and Permit 'Equivalency' Processes for CERCLA On-site Response Actions. February.

EPA, 1997. Clarification of the Role of Applicable, or Relevant and Appropriate Requirements in Establishing *Preliminary Remediation Goals Under CERCLA*. August.

EPA, 2000. Applicability of RCRA Section 3020 to In-Situ Treatment of Ground Water. December.

EPA, not dated. Class V UIC Study Fact Sheet: Aquifer Remediation Wells. OGWDW fact sheet.



ATTACHMENT: TABLES OF EXAMPLES OF COMMON CHEMICAL-, LOCATION-, AND ACTION-SPECIFIC ARARS

- TABLE 1 | Example Federal ARARs for Soil and Munitions Containment
- TABLE 2 Example Federal ARARs for Soil In Situ Treatment
- TABLE 3
 Example Federal ARARs for Soil and Munitions Ex Situ Treatment
- TABLE 4
 Example Federal ARARs for Groundwater Containment
- TABLE 5
 Example Federal ARARs for Groundwater In Situ Treatment
- TABLE 6Example Federal ARARs for Groundwater Ex Situ Treatment
- TABLE 7
 Example Federal ARARs for Sediment and Munitions Containment
- TABLE 8 Example Federal ARARs for Sediment In Situ Treatment
- TABLE 9
 Example Federal ARARs for Sediment and Munitions Ex Situ Treatment

Notes

- The federal ARARs, removal or remedial actions, and technologies listed are intended to be examples only and are not all-encompassing.
- Only federal ARARs are listed, many states have additional and/or more stringent requirements that would also pertain to the response action.
- Only broad federal citations are listed in the tables; ARAR citations should be listed more specifically for the particular action and site.
- A relative ranking format was used to identify whether each of the federal ARARs would be probable

 (\bullet) , potential (\bullet) , or not likely (\bigcirc) for each type of action. If there is a probable (\bullet) ranking, the ARAR will most likely be pertinent to the action and/or site and there should be a good reason not to include it. If there is a potential (\bullet) ranking, the ARAR will be pertinent based on the action- and site-specific activities. If there is a not likely (\bigcirc) ranking, the ARAR is not likely pertinent and there should be a good reason to include it.

• Consult Navy legal for site-specific questions and clarifications.

Acronyms

ARAR	applicable or relevant and appropriate requirement
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
DoD	Department of Defense
EPA	Environmental Protection Agency
INRMP	Integrated Natural Resources Management Plan
NPDES	National Pollutant Discharge Elimination System
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
SDWA	Safe Drinking Water Act
SPCC	Spill Prevention, Control, and Countermeasures
TSCA	Toxic Substances Control Act
USC	United States Code

TABLE 1. EXAMPLE FEDERAL ARARS FOR SOIL AND MUNITIONS CONTAINMENT

ARAR	Location of Federal Citation*	Description	Comments	Containment
Example Technologies				Soil Cover, Cap
Chemical-Specific				
Federal Maximum Contaminant Levels	40 CFR 141	Sets maximum concentrations allowable for contaminants in sources of drinking water.	Only an ARAR if the action also addresses groundwater.	0
Discharge of Effluent (on- site discharge of CERCLA waste only)	40 CFR 122 and state regulations approved under 40 CFR 131; 40 CFR 125; 40 CFR 136	Sets requirements for on-site discharges of treated wastewater to surface water.	Only an ARAR if the action includes a leachate management component.	0
Land Disposal Restrictions	40 CFR 268	Establishes treatment concentrations that must be met prior to on-site disposal of hazardous wastes. Only an ARAR when waste will be disposed of on-site (e.g., waste from off-site is brought on-site or if waste is treated ex situ prior to removal). Not an ARAR if waste is simply consolidated on-site.		0
Clean Air Act (CAA) emissions	40 CFR 50, 61	Establishes limits on the amounts of pollutants than can be discharged to the air from specified sources.	Not typically an ARAR as emissions from remediation systems are generally exempt from CAA regulations.	0
Emissions from hazardous waste processes	40 CFR 264; Subparts AA, BB, and CC	Establishes limits on the amounts of pollutants than can be discharged to the air from hazardous waste processes.	Only an ARAR if an emissions trigger the need for air pollution control.	0
Location-Specific				
Migratory Bird Treaty Act	16 USC 703	Protects almost all species of native birds in the United States from unregulated taking.	Almost always an ARAR because a migratory species is almost always present.	•
Coastal Zone Management Act	15 CFR 930	Federal activities must be consistent with, to the maximum extent practicable, state coastal zone management programs.	Only an ARAR if "actions will affect" the coastal zone, as defined by the state. Federal lands are excluded from the definition of "coastal zone."	0
Disturbance of Wetlands (CWA)	40 CFR 230, 33 CFR 320	Provides specific requirements for mitigation when an action results in a permanent loss of wetlands. Prohibits certain activities in wetland areas.	Only an ARAR if there is a wetland on-site.	0
National Historic Preservation Act	16 USC 470	Requires protection of historical and cultural resources to the maximum extent practicable.	Only an ARAR if there are identified historical or cultural resources on-site.	0
Endangered Species Act	50 CFR 402	Requires protection of threatened and endangered species and habitat.	Only an ARAR if there are identified threatened or endangered species on-site. The federal government is not subject to state laws regarding threatened and endangered species; however, many times, DoD will voluntarily comply. Performing work in accordance with the INRMP at an active installation would constitute compliance.	ο
Action-Specific				
Non-hazardous waste management (RCRA)	40 CFR 258	Provides standards for the management of non-hazardous wastes.	Almost always an ARAR for on-site waste management.	•
Hazardous waste management (RCRA)	40 CFR 264.171-175 or 40 CFR 262.34(a) incorporating 40 CFR 265.171-174 by reference	Provides standards for the management of hazardous wastes.	Only an ARAR when on-site hazardous waste management is anticipated.	ο
Closure criteria for unregulated dump (RCRA)	40 CFR 258, Subpart A	Indicates prohibited conditions for sites where disposal occurred prior to regulation.	This is an ARAR when waste disposal occurred on-site prior to waste regulation (varies per state).	•
Cap design criteria for non- hazardous waste landfill (RCRA)	40 CFR 258, Subpart F	Indicates performance standards for non-hazardous waste landfill caps.	Only an ARAR when non-hazardous waste disposal occurred on-site after waste regulation (varies per state).	ο
Cap design criteria for hazardous waste landfill (RCRA)	40 CFR 264.117(c), 228(a) and (b), 310(a) and (b)	Indicates performance standards for hazardous waste landfill caps.	Only an ARAR when hazardous waste disposal occurred on-site after waste regulation (varies per state).	o
Discharge of dredge and fill to waters of the United States (CWA)	33 CFR 320 - 330	Indicates prohibitions on dredge and fill of waters of the United States, including wetlands.	Only an ARAR if wetlands are disturbed on-site by the action. If so, this is an action-specific ARAR.	0
Management of an on- site water treatment plant (CWA/SDWA)	40 CFR 125	Requirements for the management of a water treatment plant.	Only an ARAR for actions with a leachate collection system.	0
Treatment of hazardous waste (RCRA)	40 CFR 264	Requirements and performance standards for treating and storing hazardous wastes in on-site units.	Not anticipated to be an ARAR for containment actions.	0
Land disposal restrictions (RCRA)	40 CFR 268	Specifies treatment standards and technologies for specific hazardous wastes. This is only an ARAR if hazardous wastes will undergo on-site treatment.	Not anticipated to be an ARAR for containment actions.	0

TABLE 1. EXAMPLE FEDERAL ARARS FOR SOIL AND MUNITIONS CONTAINMENT (CONTINUED)

ARAR	Location of Federal Citation*	Description	Comments	Containment
Example Technologies				Soil Cover, Cap
Underground Injection Control (CWA)	40 CFR 144, 146, and 147	Regulates the subsurface emplacement of fluids (including air) with standards for the design and operation of five classes of injection wells.	Not anticipated to be an ARAR for containment actions.	0
PCB waste management (TSCA)	40 CFR 761	Regulates the management and disposal of PCB-contaminated articles and remediation wastes.	CERCLA actions are not subject to the remediation requirements of TSCA, although the standards may be integrated at the discretion of the lead agent for PCB sites.	ο
Asbestos	40 CFR 61, Subpart M	Regulates the management and disposal of asbestos or asbestos-containing material.	Only an ARAR if friable asbestos is present on-site. Although not applicable to CERCLA sites, requirements in these sections may be relevant and appropriate to Superfund cleanup activities when they are sufficiently similar to the site situation and appropriate to the circumstances of the release.	0
Fugitive Dust Emissions	40 CFR 63	Regulates the generation of fugitive dust emissions during any on-site activity (i.e., not limited to specific sources).	Typically an ARAR as soil will likely be disturbed as part of a capping action and dust control is generally required.	•
Erosion and Sediment Control (NPDES program)	40 CFR 122	Regulates point-source discharges of stormwater pollutants to surface water.	Typically an ARAR for capping actions resulting in potential erosion.	•
Oil Storage (SPCC)	40 CFR 112	Regulates the on-site management of petroleum and non-petroleum oils.	Only an ARAR if more than 1,320 gallons of oil are stored on-site during the action.	0
Management of military munitions	40 CFR 266, Subpart M	Describes when military munitions are exempt from being managed as solid or hazardous waste.	Only an ARAR for management of unused military munitions that have been disposed of, or fired/used military munitions that have been removed from a range.	ο

Probable ARAR O Potential ARAR O Not likely ARAR

TABLE 2. EXAMPLE FEDERAL ARARS FOR SOIL IN SITU TREATMENT

					In Sit	u Treatment		
ARAR	Location of Federal Citation*	Description	Comments	Venting/ Bioremediation	In Situ Heating	"Land Tilling/ Soil Mixing"	Monitored Natural Attenuation	Soil Flushing
Example Technologies				Bioventing, Phytoremediation	Electrical Resistive Heating, Steam Injection/ Extraction, Conductive Heating, Vitrification	Soil Mixing (e.g., Zero- valent Iron, Chemical Oxidation), Metals Stabilization	Long-term Monitoring	Surfactant or Cosolvent Flushing
Chemical-Specific					l			
Federal Maximum Contaminant Levels	40 CFR 141	Sets maximum concentrations allowable for contaminants in sources of drinking water.	Only an ARAR if the action may impact groundwater.	0	0	0	0	0
Discharge of Effluent (on- site discharge of CERCLA waste only)	40 CFR 122 and state regulations approved under 40 CFR 131; 40 CFR 125; 40 CFR 136	Sets requirements for on-site discharges of treated wastewater to surface water.	Not anticipated to be an ARAR for in situ soil actions.	0	0	0	0	0
Land Disposal Restrictions	40 CFR 268	Establishes treatment concentrations that must be met prior to on-site disposal of hazardous wastes.	Not anticipated to be an ARAR because in situ treatment does not constitute disposal.	0	0	0	0	0
Clean Air Act (CAA) emissions	40 CFR 50, 61	Establishes limits on the amounts of pollutants that can be discharged to the air from specified sources.	Not typically an ARAR as emissions from remediation systems are generally exempt from CAA regulations.	0	0	0	0	0
Emissions from hazardous waste processes	40 CFR 264; Subparts AA, BB, and CC	Establishes limits on the amounts of pollutants that can be discharged to the air from hazardous waste processes.	Only an ARAR if an emissions trigger the need for air pollution control.	0	0	0	0	0
Location-Specific								
Migratory Bird Treaty Act	16 USC 703	Protects almost all species of native birds in the United States from unregulated taking.	Almost always an ARAR because a migratory species is almost always present.	•	•	•	•	•
Coastal Zone Management Act	15 CFR 930	Federal activities must be consistent with, to the maximum extent practicable, state coastal zone management programs.	Only an ARAR if "actions will affect" the coastal zone, as defined by the state. Federal lands are excluded from the definition of "coastal zone."	•	•	•	•	•
Disturbance of Wetlands (CWA)	40 CFR 230, 33 CFR 320	Provides specific requirements for mitigation when an action results in a permanent loss of wetlands. Prohibits certain activities in wetland areas.	Only an ARAR if there is a wetland on-site.	0	0	ο	ο	0
National Historic Preservation Act	16 USC 470	Requires protection of historical and cultural resources to the maximum extent practicable.	Only an ARAR if there are identified historical or cultural resources on-site.	0	0	ο	ο	0
Endangered Species Act	50 CFR 402	Requires protection of threatened and endangered species and habitat.	Only an ARAR if there are identified threatened or endangered species on-site. The federal government is not subject to state laws regarding threatened and endangered species; however, many times, DoD will voluntarily comply. Performing work in accordance with the INRMP at an active installation would constitute compliance.	0	0	o	o	0
Action-Specific								
Non-hazardous waste management (RCRA)	40 CFR 258	Provides standards for the management of non-hazardous wastes.	Almost always an ARAR for on-site waste management.	•	•	•	•	•
Hazardous waste management (RCRA)	40 CFR 264.171- 175 or 40 CFR 262.34(a) incorporating 40 CFR 265.171-174 by reference	Provides standards for the management of hazardous wastes.	Only an ARAR when on-site hazardous waste management is anticipated.	0	0	o	o	o
Closure criteria for unregulated dump (RCRA)	40 CFR 258, Subpart A	Indicates prohibited conditions for sites where disposal occurred prior to regulation.	Not anticipated to be an ARAR for in situ soil actions as they do not involve covers.	0	0	0	0	0

TABLE 2. EXAMPLE FEDERAL ARARS FOR SOIL IN SITU TREATMENT (CONTINUED)

-	Leasting				In Sit	u Treatment		
ARAR	Location of Federal Citation*	Description	Comments	Venting/ Bioremediation	In Situ Heating	"Land Tilling/ Soil Mixing"	Monitored Natural Attenuation	Soil Flushing
Example Technologies				Bioventing, Phytoremediation	Electrical Resistive Heating, Steam Injection/ Extraction, Conductive Heating, Vitrification	Soil Mixing (e.g., Zero- valent Iron, Chemical Oxidation), Metals Stabilization	Long-term Monitoring	Surfactant or Cosolvent Flushing
Cap design criteria for non- hazardous waste landfill (RCRA)	40 CFR 258, Subpart F	Indicates performance standards for non-hazardous waste landfill caps.	Not anticipated to be an ARAR for in situ soil actions as they do not involve caps.	0	0	0	0	0
Cap design criteria for hazardous waste landfill (RCRA)	40 CFR 264.117(c), 228(a) and (b), 310(a) and (b)	Indicates performance standards for hazardous waste landfill caps.	Not anticipated to be an ARAR for in situ soil actions as they do not involve caps.	0	0	0	0	0
Discharge of dredge and fill to waters of the United States (CWA)	33 CFR 320 - 330	Indicates prohibitions on dredge and fill of waters of the United States, including wetlands.	Only an ARAR if wetlands are disturbed on-site by the action. If so, this is an action-specific ARAR.	0	0	0	0	0
Management of an on- site water treatment plant (CWA/SDWA)	40 CFR 125	Requirements for the management of a water treatment plant.	Not anticipated to be an ARAR for in situ soil actions.	0	0	0	0	0
Treatment of hazardous waste (RCRA)	40 CFR 264	Requirements and performance standards for treating and storing hazardous wastes in on-site units.	Not anticipated to be an ARAR for in situ soil actions.	0	0	0	0	0
Land disposal restrictions (RCRA)	40 CFR 268	Specifies treatment standards and technologies for specific hazardous wastes. This is only an ARAR if hazardous wastes will undergo on-site treatment.	Not anticipated to be an ARAR for in situ soil actions.	0	0	0	0	0
Underground Injection Control (CWA)	40 CFR 144, 146, and 147	Regulates the subsurface emplacement of fluids (including air) with standards for the design and operation of five classes of injection wells.	Only an ARAR if delivering a fluid, including air, into the subsurface via a well or trench.	0	o	0	0	ο
PCB waste management (TSCA)	40 CFR 761	Regulates the management and disposal of PCB- contaminated articles and remediation wastes.	CERCLA actions are not subject to the remediation requirements of TSCA, although the standards may be integrated at the discretion of the lead agent.	0	o	ο	0	ο
Asbestos	40 CFR 61, Subpart M	Regulates the management and disposal of asbestos or asbestos-containing material.	Only an ARAR if friable asbestos is present on-site. Although not applicable to CERCLA sites, requirements in these sections may be relevant and appropriate to Superfund cleanup activities when they are sufficiently similar to the site situation and appropriate to the circumstances of the release.	ο	ο	ο	0	ο
Fugitive Dust Emissions	40 CFR 63	Regulates the generation of fugitive dust emissions during any on-site activity (i.e., not limited to specific sources).	Only an ARAR if soil may be disturbed as part of an in situ action and dust control is required.	0	0	•	0	•
Erosion and Sediment Control (NPDES program)	40 CFR 122	Regulates point source discharges of stormwater pollutants to surface water.	Only an ARAR when soil is disturbed, resulting in potential erosion.	0	0	•	0	0
Oil Storage (SPCC)	40 CFR 112	Regulates the on-site management of petroleum and non- petroleum oils.	Only an ARAR if more than 1,320 gallons of oil are stored on-site during the action.	0	0	0	0	0
Management of military munitions	40 CFR 266, Subpart M	Describes when military munitions are exempt from being managed as solid or hazardous waste.	Not likely an ARAR because mentions response actions generally require ex situ actions.	0	0	0	0	0
Probable ARAR O Pot	ential ARAR O Not	t likely ARAR						

TABLE 3. EXAMPLE FEDERAL ARARS FOR SOIL AND MUNITIONS EX SITU TREATMENT

				Excavation and Ex Situ Treatment						
	Location of Federal			Chemical						
ARAR	Citation*	Description	Comments	Leaching/ Soil Washing	Off-site Disposal	Bioremediation	Vapor Extraction	Thermal Treatment	Stabilization/ Solidification	
Example Technologies				Combination Acid Leaching/ Activated Carbon or Electrolytic Recovery System, Washing with Water and/ or Chemical Additives	Excavation and Off-site Disposal	Landfarming, Biocells, Biopiling, Bioreactors	Soil Venting, Vacuum Extraction	Incineration, Open Burn/ Open Detonation, Pyrolysis, Desorption, Vitrification	Portland Cement, Apatite, Organo- Clays	
Chemical-Specific					1					
Federal Maximum Contaminant Levels	40 CFR 141	Sets maximum concentrations allowable for contaminants in sources of drinking water.	Only an ARAR if the action may impact groundwater.	0	0	0	0	0	0	
Discharge of Effluent (on- site discharge of CERCLA waste only)	40 CFR 122 and state regulations approved under 40 CFR 131; 40 CFR 125; 40 CFR 136	Sets requirements for on-site discharges of treated wastewater to surface water.	Only an ARAR if wastewater is generated or if stormwater contacts contaminated media and that water is then treated and discharged on-site.	0	0	o	0	ο	ο	
Land Disposal Restrictions	40 CFR 268	Establishes treatment concentrations that must be met prior to on-site disposal of hazardous wastes.	Would be an ARAR for all ex situ actions where wastes are treated ex situ and are subsequently disposed on-site.	0	ο	0	0	0	0	
Clean Air Act (CAA) emissions	40 CFR 50, 61	Establishes limits on the amounts of pollutants than can be discharged to the air from specified sources.	Not typically an ARAR as emissions from remediation systems are generally exempt from CAA regulations.	0	0	0	0	0	0	
Emissions from hazardous waste processes	40 CFR 264; Subparts AA, BB, and CC	Establishes limits on the amounts of pollutants than can be discharged to the air from hazardous waste processes.	Only an ARAR if an emissions trigger the need for air pollution control.	0	0	0	•	•	0	
Location-Specific										
Migratory Bird Treaty Act	16 USC 703	Protects almost all species of native birds in the United States from unregulated taking.	Almost always an ARAR because a migratory species is almost always present.	•	•	•	•	•	•	
Coastal Zone Management Act	15 CFR 930	Federal activities must be consistent with, to the maximum extent practicable, state coastal zone management programs.	Only an ARAR if "actions will affect" the coastal zone, as defined by the state. Federal lands are excluded from the definition of "coastal zone."	•	•	٠	٠	٠	•	
Disturbance of Wetlands (CWA)	40 CFR 230, 33 CFR 320	Provides specific requirements for mitigation when an action results in a permanent loss of wetlands. Prohibits certain activities in wetland areas.	Only an ARAR if there is a wetland on-site.	o	ο	ο	ο	ο	ο	
National Historic Preservation Act	16 USC 470	Requires protection of historical and cultural resources to the maximum extent practicable.	Only an ARAR if there are identified historical or cultural resources on-site.	0	ο	ο	ο	0	0	
Endangered Species Act	50 CFR 402	Requires protection of threatened and endangered species and habitat.	Only an ARAR if there are identified threatened or endangered species on-site. The federal government is not subject to state laws regarding threatened and endangered species; however, many times, DoD will voluntarily comply. Performing work in accordance with the INRMP at an active installation would constitute compliance.	o	o	0	o	o	ο	
Action-Specific										
Non-hazardous waste management (RCRA)	40 CFR 258	Provides standards for the management of non- hazardous wastes.	Almost always an ARAR for on-site waste management.	•	•	•	•	•	•	
Hazardous waste management (RCRA)	40 CFR 264.171-175 or 40 CFR 262.34(a) incorporating 40 CFR 265.171-174 by reference	Provides standards for the management of hazardous wastes.	Only an ARAR when on-site hazardous waste management is anticipated.	o	o	ο	o	o	ο	
Closure criteria for unregulated dump (RCRA)	40 CFR 258, Subpart A	Indicates prohibited conditions for sites where disposal occurred prior to regulation.	Not anticipated to be an ARAR for ex situ soil actions as they do not involve covers.	0	0	0	0	0	0	

TABLE 3. EXAMPLE FEDERAL ARARS FOR SOIL AND MUNITIONS EX SITU TREATMENT (CONTINUED)

_				Excavation and Ex Situ Treatment							
ARAR	Location of Federal Citation*	Description	Comments	Chemical Leaching/ Soil Washing	Off-site Disposal	Bioremediation	Vapor Extraction	Thermal Treatment	Stabilization/ Solidification		
Example Technologies				Combination Acid Leaching/ Activated Carbon or Electrolytic Recovery System, Washing with Water and/ or Chemical Additives	Excavation and Off-site Disposal	Landfarming, Biocells, Biopiling, Bioreactors	Soil Venting, Vacuum Extraction	Incineration, Open Burn/ Open Detonation, Pyrolysis, Desorption, Vitrification	Portland Cement, Apatite, Organo- Clays		
Cap design criteria for non- hazardous waste landfill (RCRA)	40 CFR 258, Subpart F	Indicates performance standards for non-hazardous waste landfill caps.	Not anticipated to be an ARAR for ex situ soil actions as they do not involve caps.	0	0	0	0	0	0		
Cap design criteria for hazardous waste landfill (RCRA)	40 CFR 264.117(c), 228(a) and (b), 310(a) and (b)	Indicates performance standards for hazardous waste landfill caps.	Not anticipated to be an ARAR for ex situ soil actions as they do not involve caps.	0	0	0	0	0	0		
Discharge of dredge and fill to waters of the United States (CWA)	33 CFR 320 - 330	Indicates prohibitions on dredge and fill of waters of the United States, including wetlands.	Only an ARAR if wetlands are disturbed on-site by the action. If so, this is an action-specific ARAR.	0	ο	ο	ο	ο	0		
Management of an on- site water treatment plant (CWA/SDWA)	40 CFR 125	Requirements for the management of a water treatment plant.	This is an ARAR if an on-site water treatment system is needed to implement the action.	0	ο	ο	ο	ο	0		
Treatment of hazardous waste (RCRA)	40 CFR 264	Requirements and performance standards for treating and storing hazardous wastes in on-site units.	May be an ARAR for treatment facilities that are constructed on-site.	0	0	ο	ο	ο	ο		
Land disposal restrictions (RCRA)	40 CFR 268	Specifies treatment standards and technologies for specific hazardous wastes. This is only an ARAR if hazardous wastes will undergo on-site treatment.	This is an ARAR for all ex situ actions where wastes are treated ex situ and are subsequently disposed on-site.	0	o	0	ο	ο	ο		
Underground Injection Control (CWA)	40 CFR 144, 146, and 147	Regulates the subsurface emplacement of fluids (including air) with standards for the design and operation of five classes of injection wells.	Not an ARAR for ex situ technologies.	0	0	0	0	0	0		
PCB waste management (TSCA)	40 CFR 761	Regulates the management and disposal of PCB articles and remediation wastes.	CERCLA actions are not subject to the remediation requirements of TSCA, although the standards may be integrated at the discretion of the lead agent.	o	o	ο	ο	ο	0		
Asbestos	40 CFR 61, Subpart M	Regulates the management and disposal of asbestos or asbestos-containing material.	Only an ARAR if friable asbestos is present on-site. Although not applicable to CERCLA sites, requirements in these sections may be relevant and appropriate to Superfund cleanup activities when they are sufficiently similar to the site situation and appropriate to the circumstances of the release.	o	o	ο	o	0	ο		
Fugitive Dust Emissions	40 CFR 63	Regulates the generation of fugitive dust emissions during any on-site activity (i.e., not limited to specific sources).	Typically an ARAR as soil will likely be disturbed as part of an ex situ action and dust control is generally required.	•	•	•	٠	•	•		
Erosion and Sediment Control (NPDES program)	40 CFR 122	Regulates point source discharges of stormwater pollutants to surface water.	Likely an ARAR when soil is disturbed, resulting in potential erosion.	0	0	0	ο	0	0		
Oil Storage (SPCC)	40 CFR 112	Regulates the on-site management of petroleum and non-petroleum oils.	Only an ARAR if more than 1,320 gallons of oil are stored on- site during the action.	0	0	ο	ο	0	0		
Management of military munitions	40 CFR 266, Subpart M	Describes when military munitions are exempt from being managed as solid or hazardous waste.	Only an ARAR for management of unused military munitions that have been disposed of, or fired/used military munitions that have been removed from a range. There are generally no ARARs for demilitarization.	0	o	0	0	0	0		
Probable ARAR O Pot	tential ARAR O Not like	ely ARAR									

TABLE 4. EXAMPLE FEDERAL ARARS FOR GROUNDWATER CONTAINMENT

	ARAR Location of Federal Description Comments				Containme	nt
ARAR		Description	Comments	Slurry Wall	Sheet Pile	Pump and Treat
Example Technologies				Bentonite, Attapulgite	Physical Barrier	French Drain Collection Trench
Chemical-Specific						
Federal Maximum Contaminant Levels	40 CFR 141	Sets maximum concentrations allowable for contaminants in sources of drinking water.	This is likely an ARAR for setting remedial goals.	•	•	•
Discharge of Effluent (on- site discharge of CERCLA waste only)	40 CFR 122 and state regulations approved under 40 CFR 131; 40 CFR 125; 40 CFR 136	Sets requirements for on-site discharges of treated wastewater to surface water.	This is an ARAR if the action includes on-site wastewater, including groundwater and surface water, discharge.	ο	ο	•
Land Disposal Restrictions	40 CFR 268	Establishes treatment concentrations that must be met prior to on-site disposal of hazardous wastes.	Not likely an ARAR because land disposal is generally not a component of groundwater actions.	0	0	0
Clean Air Act (CAA) emissions	40 CFR 50, 61	Establishes limits on the amounts of pollutants than can be discharged to the air from specified sources.	Not typically an ARAR as emissions from remediation systems are generally exempt from CAA regulations.	0	0	ο
Emissions from hazardous waste processes	40 CFR 264; Subparts AA, BB, and CC	Establishes limits on the amounts of pollutants than can be discharged to the air from hazardous waste processes.	Only an ARAR if an emissions trigger the need for air pollution control.	0	0	•
Location-Specific						
Migratory Bird Treaty Act	16 USC 703	Protects almost all species of native birds in the United States from unregulated taking.	Almost always an ARAR because a migratory species is almost always present.	•	•	•
Coastal Zone Management Act	15 CFR 930	Federal activities must be consistent with, to the maximum extent practicable, state coastal zone management programs.	Only an ARAR if "actions will affect" the coastal zone, as defined by the state. Federal lands are excluded from the definition of "coastal zone."	•	•	•
Disturbance of Wetlands (CWA)	40 CFR 230, 33 CFR 320	Provides specific requirements for mitigation when an action results in a permanent loss of wetlands. Prohibits certain activities in wetland areas.	Only an ARAR if there is a wetland on-site.	ο	ο	ο
National Historic Preservation Act	16 USC 470	Requires protection of historical and cultural resources to the maximum extent practicable.	Only an ARAR if there are identified historical or cultural resources on-site.	ο	ο	ο
Endangered Species Act	50 CFR 402	Requires protection of threatened and endangered species and habitat.	Only an ARAR if there are identified threatened or endangered species on-site. The federal government is not subject to state laws regarding threatened and endangered species; however, many times, DoD will voluntarily comply. Performing work in accordance with the INRMP at an active installation would constitute compliance.	ο	o	ο
Action-Specific						
Non-hazardous waste management (RCRA)	40 CFR 258	Provides standards for the management of non-hazardous wastes.	Almost always an ARAR for on-site waste management.	•	•	•
Hazardous waste management (RCRA)	40 CFR 264.171-175 or 40 CFR 262.34(a) incorporating 40 CFR 265.171-174 by reference	Provides standards for the management of hazardous wastes.	Only an ARAR when on-site hazardous waste management is anticipated.	o	o	ο
Closure criteria for unregulated dump (RCRA)	40 CFR 258, Subpart A	Indicates prohibited conditions for sites where disposal occurred prior to regulation.	Not likely an ARAR for groundwater actions.	0	0	0
Cap design criteria for non- hazardous waste landfill (RCRA)	40 CFR 258, Subpart F	Indicates performance standards for non-hazardous waste landfill caps.	Not likely an ARAR for groundwater actions.	0	0	0
Cap design criteria for hazardous waste landfill (RCRA)	40 CFR 264.117(c), 228(a) and (b), 310(a) and (b)	Indicates performance standards for hazardous waste landfill caps.	Not likely an ARAR for groundwater actions.	0	0	0
Discharge of dredge and fill to waters of the United States (CWA)	33 CFR 320 - 330	Indicates prohibitions on dredge and fill of waters of the United States, including wetlands.	Only an ARAR if wetlands are disturbed on-site by the action, then this is an action-specific ARAR.	ο	ο	ο

TABLE 4. EXAMPLE FEDERAL ARARS FOR GROUNDWATER CONTAINMENT (CONTINUED)

	Location of Federal				Containme	nt
ARAR	Citation*	Description	Comments	Slurry Wall	Sheet Pile	Pump and Treat
Example Technologies				Bentonite, Attapulgite	Physical Barrier	French Drain Collection Trench
Management of an on- site water treatment plant (CWA/SDWA)	40 CFR 125	Requirements for the management of a water treatment plant.	Only an ARAR if an on-site water treatment system is needed to implement the action.	0	0	•
Treatment of hazardous waste (RCRA)	40 CFR 264	Requirements and performance standards for treating and storing hazardous wastes in on-site units.	Only an ARAR for actions with on-site treatment of hazardous waste.	0	0	•
Land disposal restrictions (RCRA)	40 CFR 268	Specifies treatment standards and technologies for specific hazardous wastes. This is only an ARAR if hazardous wastes will undergo on-site treatment.	Not likely an ARAR because land disposal is generally not a component of groundwater actions.	0	0	0
Underground Injection Control (CWA)	40 CFR 144, 146, and 147	Regulates the subsurface emplacement of fluids (including air) with standards for the design and operation of five classes of injection wells.	Only an ARAR if delivering a fluid, including air, into the subsurface via a well or trench.	•	0	0
PCB waste management (TSCA)	40 CFR 761	Regulates the management and disposal of PCB-contaminated articles and remediation wastes.	CERCLA actions are not subject to the remediation requirements of TSCA, although the standards may be integrated at the discretion of the lead agent.	0	0	0
Asbestos	40 CFR 61, Subpart M	Regulates the management and disposal of asbestos or asbestos-containing material.	Only an ARAR if friable asbestos is present on-site. Although not applicable to CERCLA sites, requirements in these sections may be relevant and appropriate to Superfund cleanup activities when they are sufficiently similar to the site situation and appropriate to the circumstances of the release.	0	0	0
Fugitive Dust Emissions	40 CFR 63	Regulates the generation of fugitive dust emissions during any on-site activity (i.e., not limited to specific sources).	Only an ARAR if soil is disturbed as part of the construction.	0	0	0
Erosion and Sediment Control (NPDES program)	40 CFR 122	Regulates point source discharges of stormwater pollutants to surface water.	Only an ARAR if soil is disturbed as part of the construction, resulting in potential erosion.	0	0	0
Oil Storage (SPCC)	40 CFR 112	Regulates the on-site management of petroleum and non-petroleum oils.	Only an ARAR if more than 1,320 gallons of oil are stored on-site during the action.	0	0	0
Management of military munitions	40 CFR 266 Subpart M	Describes when military munitions are exempt from being managed as solid or hazardous waste.	Not anticipated to be an ARAR for groundwater actions.	0	0	0

TABLE 5. EXAMPLE FEDERAL ARARS FOR GROUNDWATER IN SITU TREATMENT

_						In S	itu Treatment		
ARAR	Location of Federal Citation*	Description	Comments	Air Sparging	Non-oil Chemical Additives	Enhanced Bioremediation	In Situ Heating	Monitored Natural Attenuation	Phytoremediation
Example Technologies					Chemical Oxidation, Chemical Reduction (Barrier/ Injection), Surfactant	Mulch Wall, Soluble Substrate Injection (molasses, lactate), Insoluble Substrate Injection (emulsified oil)	Electrical Resistive Heating, Steam Injection/ Extraction, Conductive Heating	Long-term Monitoring	Phytoextraction, Rhizodegradation, Phytodegradation, Phytovolatilization
Chemical-Specific	40.0ED 444	Sets maximum concentrations allowable for	This is likely on ADAD for acting remodial scale						
Federal Maximum Contaminant Levels	40 CFR 141	contaminants in sources of drinking water.	This is likely an ARAR for setting remedial goals.	•	٠	•	•	•	•
Discharge of Effluent (on- site discharge of CERCLA waste only)	40 CFR 122 and state regulations approved under 40 CFR 131; 40 CFR 125; 40 CFR 136;	Sets requirements for on-site discharges of treated wastewater to surface water.	Only an ARAR if the action includes on-site wastewater, including groundwater and surface water, discharge.	0	0	0	0	0	0
Land Disposal Restrictions	40 CFR 268	Establishes treatment concentrations that must be met prior to on-site disposal of hazardous wastes.	Not likely an ARAR because land disposal is generally not a component of groundwater actions.	0	0	0	0	0	0
Clean Air Act (CAA) emissions	40 CFR 50, 61	Establishes limits on the amounts of pollutants that can be discharged to the air from specified sources.	Not typically an ARAR as emissions from remediation systems are generally exempt from CAA regulations.	0	0	0	0	0	0
Emissions from hazardous waste processes	40 CFR 264; Subparts AA, BB, and CC	Establishes limits on the amounts of pollutants that can be discharged to the air from hazardous waste processes.	Only an ARAR if an emissions trigger the need for air pollution control.	•	0	0	0	0	0
Location-Specific									
Migratory Bird Treaty Act	16 USC 703	Protects almost all species of native birds in the United States from unregulated taking.	Almost always an ARAR because a migratory species is almost always present.	•	•	•	•	•	•
Coastal Zone Management Act	15 CFR 930	Federal activities must be consistent with, to the maximum extent practicable, state coastal zone management programs.	Only an ARAR if "actions will affect" the coastal zone, as defined by the state. Federal lands are excluded from the definition of "coastal zone."	•	٠	٠	•	•	•
Disturbance of Wetlands (CWA)	40 CFR 230, 33 CFR 320	Provides specific requirements for mitigation when an action results in a permanent loss of wetlands. Prohibits certain activities in wetland areas.	Only an ARAR if there is a wetland on-site.	ο	0	ο	0	0	o
National Historic Preservation Act	16 USC 470	Requires protection of historical and cultural resources to the maximum extent practicable.	Only an ARAR if there are identified historical or cultural resources on-site.	ο	0	0	ο	0	0
Endangered Species Act	50 CFR 402	Requires protection of threatened and endangered species and habitat.	Only an ARAR if there are identified threatened or endangered species on-site. The federal government is not subject to state laws regarding threatened and endangered species; however, many times, DoD will voluntarily comply. Performing work in accordance with the INRMP at an active installation would constitute compliance.	0	0	0	0	0	ο
Action-Specific									
Non-hazardous waste management (RCRA)	40 CFR 258	Provides standards for the management of non- hazardous wastes.	Almost always an ARAR for on-site waste management.	•	٠	•	•	•	•
Hazardous waste management (RCRA)	40 CFR 264.171-175 or 40 CFR 262.34(a) incorporating 40 CFR 265.171-174 by	Provides standards for the management of hazardous wastes.	Only an ARAR when on-site hazardous waste management is anticipated.	0	0	ο	ο	ο	ο
	reference								

TABLE 5. EXAMPLE FEDERAL ARARS FOR GROUNDWATER IN SITU TREATMENT (CONTINUED)

-						In S	itu Treatment		
ARAR	Location of Federal Citation*	Description	Comments	Air Sparging	Non-oil Chemical Additives	Enhanced Bioremediation	In Situ Heating	Monitored Natural Attenuation	Phytoremediation
Example Technologies					Chemical Oxidation, Chemical Reduction (Barrier/ Injection), Surfactant	Mulch Wall, Soluble Substrate Injection (molasses, lactate), Insoluble Substrate Injection (emulsified oil)	Electrical Resistive Heating, Steam Injection/ Extraction, Conductive Heating	Long-term Monitoring	Phytoextraction, Rhizodegradation, Phytodegradation, Phytovolatilization
Closure criteria for unregulated dump (RCRA)	40 CFR 258, Subpart A	Indicates prohibited conditions for sites where disposal occurred prior to regulation.	Not likely an ARAR for groundwater actions.	0	0	0	0	0	0
Cap design criteria for non- hazardous waste landfill (RCRA)	40 CFR 258, Subpart F	Indicates performance standards for non-hazardous waste landfill caps.	Not likely an ARAR for groundwater actions.	0	0	0	0	0	0
Cap design criteria for hazardous waste landfill (RCRA)	40 CFR 264.117(c), 228(a) and (b), 310(a) and (b)	Indicates performance standards for hazardous waste landfill caps.	Not likely an ARAR for groundwater actions.	0	0	0	0	0	0
Discharge of dredge and fill to waters of the United States (CWA)	33 CFR 320 - 330	Indicates prohibitions on dredge and fill of waters of the United States, including wetlands.	Not likely an ARAR for in situ groundwater actions.	0	0	0	0	0	0
Management of an on- site water treatment plant (CWA/SDWA)	40 CFR 125	Requirements for the management of a water treatment plant.	Not likely an ARAR for in situ groundwater actions.	0	0	0	0	0	0
Treatment of hazardous waste (RCRA)	40 CFR 264	Requirements and performance standards for treating and storing hazardous wastes in on-site units.	Not likely an ARAR for in situ groundwater actions.	0	0	0	0	0	0
Land disposal restrictions (RCRA)	40 CFR 268	Specifies treatment standards and technologies for specific hazardous wastes. This is only an ARAR if hazardous wastes will undergo on-site treatment.	Not likely an ARAR for in situ groundwater actions.	0	0	0	0	0	0
Underground Injection Control (CWA)	40 CFR 144, 146, and 147	Regulates the subsurface emplacement of fluids (including air) with standards for the design and operation of five classes of injection wells.	This is an ARAR if delivering a fluid, including air, into the subsurface via a well or trench.	•	•	٠	٠	0	0
PCB waste management (TSCA)	40 CFR 761	Regulates the management and disposal of PCB- contaminated articles and remediation wastes.	CERCLA actions are not subject to the remediation requirements of TSCA, although the standards may be integrated at the discretion of the lead agent.	0	0	0	0	0	0
Asbestos	40 CFR 61, Subpart M	Regulates the management and disposal of asbestos or asbestos-containing material.	Only an ARAR if friable asbestos is present on-site. Although not applicable to CERCLA sites, requirements in these sections may be relevant and appropriate to Superfund cleanup activities when they are sufficiently similar to the site situation and appropriate to the circumstances of the release.	0	0	0	0	0	0
Fugitive Dust Emissions	40 CFR 63	Regulates the generation of fugitive dust emissions during any on-site activity (i.e., not limited to specific sources).	Only an ARAR if soil is disturbed as part of the construction.	ο	ο	0	0	0	o
Erosion and Sediment Control (NPDES program)	40 CFR 122	Regulates point source discharges of stormwater pollutants to surface water.	Only an ARAR if soil is disturbed as part of the construction, resulting in potential erosion.	0	0	ο	0	0	ο
Oil Storage (SPCC)	40 CFR 112	Regulates the on-site management of petroleum and non-petroleum oils.	Only an ARAR if more than 1,320 gallons of oil are stored on- site during the action.	0	0	ο	0	0	0
Management of military munitions	40 CFR 266 Subpart M	Describes when military munitions are exempt from being managed as solid or hazardous waste.	Not anticipated to be an ARAR for groundwater actions.	0	0	0	0	0	0
Probable ARAR O Pot	tential ARAR O Not like	ely ARAR							

TABLE 6. EXAMPLE FEDERAL ARARS FOR GROUNDWATER EX SITU TREATMENT

ARAR	Location of Federal	Description	Comments				Ex Situ Treatme	ont		
	Citation*	Description			1					
Example Technologies				Air Stripping	Bioreactors	Chemical Oxidation/ Reduction	Constructed Wetlands	Granular Activated Carbon	lon Exchange	Precipitation
Chemical-Specific										
Federal Maximum Contaminant Levels	40 CFR 141	Sets maximum concentrations allowable for contaminants in sources of drinking water.	This is likely an ARAR for setting remedial goals.	•	٠	•	٠	•	•	•
Discharge of Effluent (on- site discharge of CERCLA waste only)	40 CFR 122 and state regulations approved under 40 CFR 131; 40 CFR 125; 40 CFR 136	Sets requirements for on-site discharges of treated wastewater to surface water.	This is likely an ARAR unless discharging off-site and/or to an off-site water treatment plant.	•	•	٠	•	•	•	•
Land Disposal Restrictions	40 CFR 268	Establishes treatment concentrations that must be met prior to on-site disposal of hazardous wastes.	Not likely an ARAR because land disposal is generally not a component of groundwater actions.	0	0	0	0	0	0	0
Clean Air Act (CAA) emissions	40 CFR 50, 61	Establishes limits on the amounts of pollutants that can be discharged to the air from specified sources.	Not typically an ARAR as emissions from remediation systems are generally exempt from CAA regulations.	ο	0	0	0	0	0	0
Emissions from hazardous waste processes	40 CFR 264; Subparts AA, BB, and CC	Establishes limits on the amounts of pollutants that can be discharged to the air from hazardous waste processes.	Only an ARAR if an emissions trigger the need for air pollution control.	ο	0	0	0	ο	ο	ο
Location-Specific										
Migratory Bird Treaty Act	16 USC 703	Protects almost all species of native birds in the United States from unregulated taking.	Almost always an ARAR because a migratory species is almost always present.	•	٠	•	٠	•	•	•
Coastal Zone Management Act	15 CFR 930	Federal activities must be consistent with, to the maximum extent practicable, state coastal zone management programs.	Only an ARAR if "actions will affect" the coastal zone, as defined by the state. Federal lands are excluded from the definition of "coastal zone."	•	٠	•	•	•	٠	•
Disturbance of Wetlands (CWA)	40 CFR 230, 33 CFR 320	Provides specific requirements for mitigation when an action results in a permanent loss of wetlands. Prohibits certain activities in wetland areas.	Only an ARAR if there is a wetland on-site.	ο	ο	0	ο	ο	ο	ο
National Historic Preservation Act	16 USC 470	Requires protection of historical and cultural resources to the maximum extent practicable.	Only an ARAR if there are identified historical or cultural resources on-site.	ο	0	0	0	0	0	0
Endangered Species Act	50 CFR 402	Requires protection of threatened and endangered species and habitat.	Only an ARAR if there are identified threatened or endangered species on-site. The federal government is not subject to state laws regarding threatened and endangered species; however, many times, DoD will voluntarily comply. Performing work in accordance with the INRMP at an active installation would constitute compliance.	o	o	0	o	0	o	o
Action-Specific										
Non-hazardous waste management (RCRA)	40 CFR 258	Provides standards for the management of non- hazardous wastes.	Almost always an ARAR for on-site waste management.	•	٠	•	٠	•	•	•
Hazardous waste management (RCRA)	40 CFR 264.171-175 or 40 CFR 262.34(a) incorporating 40 CFR 265.171-174 by reference	Provides standards for the management of hazardous wastes.	Only an ARAR when on-site hazardous waste management is anticipated.	0	0	o	ο	ο	ο	o
Closure criteria for unregulated dump (RCRA)	40 CFR 258, Subpart A	Indicates prohibited conditions for sites where disposal occurred prior to regulation.	Not anticipated to be an ARAR for groundwater actions.	0	0	0	0	0	0	0
Cap design criteria for non- hazardous waste landfill (RCRA)	40 CFR 258, Subpart F	Indicates performance standards for non-hazardous waste landfill caps.	Not anticipated to be an ARAR for groundwater actions.	0	0	0	0	0	0	0
Cap design criteria for hazardous waste landfill (RCRA)	40 CFR 264.117(c), 228(a) and (b), 310(a) and (b)	Indicates performance standards for hazardous waste landfill caps.	Not anticipated to be an ARAR for groundwater actions.	0	0	0	0	0	0	0

TABLE 6. EXAMPLE FEDERAL ARARS FOR GROUNDWATER EX SITU TREATMENT (CONTINUED)

ARAR	Location of Federal Citation*	Description	Comments			I	Ex Situ Treatme	ent		
Example Technologies	1			Air Stripping	Bioreactors	Chemical Oxidation/ Reduction	Constructed Wetlands	Granular Activated Carbon	lon Exchange	Precipitation
Discharge of dredge and fill to waters of the United States (CWA)	33 CFR 320 - 330	Indicates prohibitions on dredge and fill of waters of the United States, including wetlands.	Only an ARAR if wetlands are disturbed on-site by the action, then this is an action-specific ARAR.	0	0	0	•	0	0	0
Management of an on- site water treatment plant (CWA/SDWA)	40 CFR 125	Requirements for the management of a water treatment plant.	Only an ARAR if an on-site water treatment system is needed to implement the action.	o	ο	ο	0	0	ο	ο
Treatment of hazardous waste (RCRA)	40 CFR 264	Requirements and performance standards for treating and storing hazardous wastes in on-site units.	Likely an ARAR for treatment facilities that are constructed on-site.	ο	ο	0	0	0	o	ο
Land disposal restrictions (RCRA)	40 CFR 268	Specifies treatment standards and technologies for specific hazardous wastes. This is only an ARAR if hazardous wastes will undergo on-site treatment.	Only an ARAR for actions where wastes are treated ex situ and are subsequently disposed on-site.	0	0	0	ο	0	0	0
Underground Injection Control (CWA)	40 CFR 144, 146, and 147	Regulates the subsurface emplacement of fluids (including air) with standards for the design and operation of five classes of injection wells.	This is an ARAR if reinjecting the treated groundwater into the subsurface via a well or trench.	o	ο	0	0	0	ο	ο
PCB waste management (TSCA)	40 CFR 761	Regulates the management and disposal of PCB articles and remediation wastes.	CERCLA actions are not subject to the remediation requirements of TSCA, although the standards may be integrated at the discretion of the lead agent.	0	0	0	0	0	0	0
Asbestos	40 CFR 61, Subpart M	Regulates the management and disposal of asbestos or asbestos-containing material.	Only an ARAR if friable asbestos is present on-site. Although not applicable to CERCLA sites, requirements in these sections may be relevant and appropriate to Superfund cleanup activities when they are sufficiently similar to the site situation and appropriate to the circumstances of the release.	0	0	0	0	0	0	0
Fugitive Dust Emissions	40 CFR 63	Regulates the generation of fugitive dust emissions during any on-site activity (i.e., not limited to specific sources).	This is an ARAR when soil is disturbed as part of the construction and dust control is generally required.	•	•	•	•	•	•	•
Erosion and Sediment Control (NPDES program)	40 CFR 122	Regulates point source discharges of stormwater pollutants to surface water.	Only an ARAR if soil is disturbed as part of the construction, resulting in potential erosion.	ο	0	ο	0	0	0	ο
Oil Storage (SPCC)	40 CFR 112	Regulates the on-site management of petroleum and non-petroleum oils.	Only an ARAR if more than 1,320 gallons of oil are stored on- site during the action.	ο	0	ο	0	0	0	ο
Management of military munitions	40 CFR 266 Subpart M	Describes when military munitions are exempt from being managed as solid or hazardous waste.	Not anticipated to be an ARAR for groundwater actions.	0	0	0	0	0	0	0
Probable ARAR O Po	tential ARAR O Not like	aly ARAR								

TABLE 7. EXAMPLE FEDERAL ARARS FOR SEDIMENT AND MUNITIONS CONTAINMENT

ARAR	Location of Federal Citation*	Description	Comments	Containment In Situ Capping
Example Technologies				Thin Layer Sand Cap
Chemical-Specific				
Federal Maximum Contaminant Levels	40 CFR 141	Sets maximum concentrations allowable for contaminants in sources of drinking water.	Only an ARAR if the action also addresses groundwater.	0
Discharge of Effluent (on- site discharge of CERCLA waste only)	40 CFR 122 and state regulations approved under 40 CFR 131; 40 CFR 125; 40 CFR 136;	Sets requirements for on-site discharges of treated wastewater to surface water.	This is an ARAR if the action requires compliance with surface water quality standards.	o
Land Disposal Restrictions	40 CFR 268	Establishes treatment concentrations that must be met prior to on-site disposal of hazardous wastes.	Not anticipated to be an ARAR for sediment containment actions.	0
Clean Air Act (CAA) emissions	40 CFR 50, 61	Establishes limits on the amounts of pollutants than can be discharged to the air from specified sources.	Not typically an ARAR as emissions from remediation systems are generally exempt from CAA regulations.	0
Emissions from hazardous waste processes	40 CFR 264; Subparts AA, BB, and CC	Establishes limits on the amounts of pollutants than can be discharged to the air from hazardous waste processes.	Only an ARAR if an emissions trigger the need for air pollution control.	0
Location-Specific				
Migratory Bird Treaty Act	16 USC 703	Protects almost all species of native birds in the United States from unregulated taking.	Almost always an ARAR because a migratory species is almost always present.	•
Coastal Zone Management Act	15 CFR 930	Federal activities must be consistent with, to the maximum extent practicable, state coastal zone management programs.	Only an ARAR if "actions will affect" the coastal zone, as defined by the state. Federal lands are excluded from the definition of "coastal zone."	•
Disturbance of Wetlands (CWA)	40 CFR 230, 33 CFR 320	Provides specific requirements for mitigation when an action results in a permanent loss of wetlands. Prohibits certain activities in wetland areas.	Only an ARAR if there is a wetland on-site.	0
National Historic Preservation Act	16 USC 470	Requires protection of historical and cultural resources to the maximum extent practicable.	Only an ARAR if there are identified historical or cultural resources on-site.	ο
Endangered Species Act	50 CFR 402	Requires protection of threatened and endangered species and habitat.	Only an ARAR if there are identified threatened or endangered species on-site. The federal government is not subject to state laws regarding threatened and endangered species; however, many times, DoD will voluntarily comply. Performing work in accordance with the INRMP at an active installation would constitute compliance.	o
Action-Specific				
Non-hazardous waste management (RCRA)	40 CFR 258	Provides standards for the management of non-hazardous wastes.	Almost always an ARAR for on-site waste management.	•
Hazardous waste management (RCRA)	40 CFR 264.171-175 or 40 CFR 262.34(a) incorporating 40 CFR 265.171-174 by reference	Provides standards for the management of hazardous wastes.	Only an ARAR when on-site hazardous waste management is anticipated.	o
Closure criteria for unregulated dump (RCRA)	40 CFR 258, Subpart A	Indicates prohibited conditions for sites where disposal occurred prior to regulation.	Not likely an ARAR.	0
Cap design criteria for non- hazardous waste landfill (RCRA)	40 CFR 258, Subpart F	Indicates performance standards for non-hazardous waste landfill caps.	Not likely an ARAR.	0
Cap design criteria for hazardous waste landfill (RCRA)	40 CFR 264.117(c), 228(a) and (b), 310(a) and (b)	Indicates performance standards for hazardous waste landfill caps.	Not likely an ARAR.	0
Discharge of dredge and fill to waters of the United States (CWA)	33 CFR 320 - 330	Indicates prohibitions on dredge and fill of waters of the United States, including wetlands	This is an action-specific ARAR If wetlands/waters of the United States are disturbed on-site by the action.	•
Management of an on- site water treatment plant (CWA/SDWA)	40 CFR 125	Requirements for the management of a water treatment plant.	Not likely an ARAR.	0

TABLE 7. EXAMPLE FEDERAL ARARS FOR SEDIMENT AND MUNITIONS CONTAINMENT (CONTINUED)

ARAR	Location of Federal Citation*	Description	Comments	Containment In Situ Capping
Example Technologies				Thin Layer Sand Cap
Treatment of hazardous waste (RCRA)	40 CFR 264	Requirements and performance standards for treating and storing hazardous wastes in on-site units.	Not anticipated to be an ARAR for sediment containment actions.	0
Land disposal restrictions (RCRA)	40 CFR 268	Specifies treatment standards and technologies for specific hazardous wastes. This is only an ARAR if hazardous wastes will undergo on-site treatment.	Not anticipated to be an ARAR for sediment containment actions.	0
Underground Injection Control (CWA)	40 CFR 144, 146, and 147	Regulates the subsurface emplacement of fluids (including air) with standards for the design and operation of five classes of injection wells.	Not anticipated to be an ARAR for sediment containment actions.	0
PCB waste management (TSCA)	40 CFR 761	Regulates the management and disposal of PCB articles and remediation wastes.	Not anticipated to be an ARAR for sediment containment actions.	0
Asbestos	40 CFR 61, Subpart M	Regulates the management and disposal of asbestos or asbestos containing material.	Not anticipated to be an ARAR for sediment containment actions.	0
Fugitive Dust Emissions	40 CFR 63	Regulates the generation of fugitive dust emissions during any on-site activity (i.e., not limited to specific sources).	Not anticipated to be an ARAR for containment actions.	0
Erosion and Sediment Control (NPDES program)	40 CFR 122	Regulates point-source discharges of stormwater pollutants to surface water.	Not anticipated to be an ARAR for containment actions.	0
Oil Storage (SPCC)	40 CFR 112	Regulates the on-site management of petroleum and non-petroleum oils.	Only an ARAR if more than 1,320 gallons of oil are stored on-site during the action.	0
Management of military munitions	40 CFR 266, Subpart M	Describes when military munitions are exempt from being managed as solid or hazardous waste.	Only an ARAR for management of unused military munitions that have been disposed of, or fired/used military munitions that have been removed from a range.	0
Probable ARAR O Pot	ential ARAR O Not like	ly ARAR		

TABLE 8. EXAMPLE FEDERAL ARARS FOR SEDIMENT IN SITU TREATMENT

	Lesstion of Federal				In Situ Tre	atment	
ARAR	Location of Federal Citation*	Description	Comments	In Situ Capping	In Situ Bioremediation	Natural Recovery	Phyto- remediation
Example Technologies				Single or Multi- Amendment Cap, Reactive Cap	Amendment, Injection, Mixing	Natural Attenuation	Installation of Plant Materials
Chemical-Specific							
Federal Maximum Contaminant Levels	40 CFR 141	Sets maximum concentrations allowable for contaminants in sources of drinking water.	Only an ARAR if the action also addresses groundwater.	0	0	0	0
Discharge of Effluent (on- site discharge of CERCLA waste only)	40 CFR 122 and state regulations approved under 40 CFR 131; 40 CFR 125; 40 CFR 136;	Sets requirements for on-site discharges of treated wastewater to surface water.	This is an ARAR if the action requires compliance with surface water quality standards.	o	o	ο	o
Land Disposal Restrictions	40 CFR 268	Establishes treatment concentrations that must be met prior to on-site disposal of hazardous wastes.	Not anticipated to be an ARAR for in situ sediment actions.	0	0	0	0
Clean Air Act (CAA) emissions	40 CFR 50, 61	Establishes limits on the amounts of pollutants than can be discharged to the air from specified sources.	Not typically an ARAR as emissions from remediation systems are generally exempt from CAA regulations.	0	0	0	0
Emissions from hazardous waste processes	40 CFR 264; Subparts AA, BB, and CC	Establishes limits on the amounts of pollutants than can be discharged to the air from hazardous waste processes.	Only an ARAR if an emissions trigger the need for air pollution control.	0	0	0	0
Location-Specific							
Migratory Bird Treaty Act	16 USC 703	Protects almost all species of native birds in the United States from unregulated taking.	Almost always an ARAR because a migratory species is almost always present.	•	•	٠	•
Coastal Zone Management Act	15 CFR 930	Federal activities must be consistent with, to the maximum extent practicable, state coastal zone management programs.	Only an ARAR if "actions will affect" the coastal zone, as defined by the state. Federal lands are excluded from the definition of "coastal zone."	•	•	٠	•
Disturbance of Wetlands (CWA)	40 CFR 230, 33 CFR 320	Provides specific requirements for mitigation when an action results in a permanent loss of wetlands. Prohibits certain activities in wetland areas.	Only an ARAR if there is a wetland on-site.	0	0	0	0
National Historic Preservation Act	16 USC 470	Requires protection of historical and cultural resources to the maximum extent practicable.	Only an ARAR if there are identified historical or cultural resources on-site.	ο	0	ο	0
Endangered Species Act	50 CFR 402	Requires protection of threatened and endangered species and habitat.	Only an ARAR if there are identified threatened or endangered species on- site. The federal government is not subject to state laws regarding threatened and endangered species; however, many times, DoD will voluntarily comply. Performing work in accordance with the INRMP at an active installation would constitute compliance.	o	o	o	0
Action-Specific							
Non-hazardous waste management (RCRA)	40 CFR 258	Provides standards for the management of non-hazardous wastes.	Almost always an ARAR for on-site waste management.	•	•	٠	•
Hazardous waste management (RCRA)	40 CFR 264.171-175 or 40 CFR 262.34(a) incorporating 40 CFR 265.171-174 by reference	Provides standards for the management of hazardous wastes.	Only an ARAR when on-site hazardous waste management is anticipated.	o	o	o	ο
Closure criteria for unregulated dump (RCRA)	40 CFR 258, Subpart A	Indicates prohibited conditions for sites where disposal occurred prior to regulation.	Not likely an ARAR.	0	0	0	0
Cap design criteria for non- hazardous waste landfill (RCRA)	40 CFR 258, Subpart F	Indicates performance standards for non-hazardous waste landfill caps.	Not likely an ARAR.	0	0	0	0
Cap design criteria for hazardous waste landfill (RCRA)	40 CFR 264.117(c), 228(a) and (b), 310(a) and (b)	Indicates performance standards for hazardous waste landfill caps.	Not likely an ARAR.	0	0	0	0

TABLE 8. EXAMPLE FEDERAL ARARS FOR SEDIMENT IN SITU TREATMENT (CONTINUED)

-					In Situ Tre	atment	
ARAR	Location of Federal Citation*	Description	Comments	In Situ Capping	In Situ Bioremediation	Natural Recovery	Phyto- remediation
Example Technologies				Single or Multi- Amendment Cap, Reactive Cap	Amendment, Injection, Mixing	Natural Attenuation	Installation of Plant Materials
Discharge of dredge and fill to waters of the United States (CWA)	33 CFR 320 - 330	Indicates prohibitions on dredge and fill of waters of the United States, including wetlands.	This is an action-specific ARAR If wetlands/waters of the United States are disturbed on-site by the action.	٠	•	٠	•
Management of an on- site water treatment plant (CWA/SDWA)	40 CFR 125	Requirements for the management of a water treatment plant.	Not likely an ARAR.	0	0	0	0
Treatment of hazardous waste (RCRA)	40 CFR 264	Requirements and performance standards for treating and storing hazardous wastes in on-site units.	Not likely an ARAR.	0	0	0	0
Land disposal restrictions (RCRA)	40 CFR 268	Specifies treatment standards and technologies for specific hazardous wastes. This is only an ARAR if hazardous wastes will undergo on-site treatment.	Not likely an ARAR.	0	0	0	0
Underground Injection Control (CWA)	40 CFR 144, 146, and 147	Regulates the subsurface emplacement of fluids (including air) with standards for the design and operation of five classes of injection wells.	Only an ARAR if delivering a fluid, including air, into the subsurface via a well or trench.	0	ο	0	0
PCB waste management (TSCA)	40 CFR 761	Regulates the management and disposal of PCB articles and remediation wastes.	Not likely an ARAR.	0	0	0	0
Asbestos	40 CFR 61, Subpart M	Regulates the management and disposal of asbestos or asbestos- containing material.	Not likely an ARAR.	0	0	0	0
Fugitive Dust Emissions	40 CFR 63	Regulates the generation of fugitive dust emissions during any on-site activity (i.e., not limited to specific sources).	Not likely an ARAR.	0	0	0	0
Erosion and Sediment Control (NPDES program)	40 CFR 122	Regulates point source discharges of stormwater pollutants to surface water.	May be an ARAR related to turbidity controls.	0	ο	0	0
Oil Storage (SPCC)	40 CFR 112	Regulates the on-site management of petroleum and non-petroleum oils.	Only an ARAR if more than 1,320 gallons of oil are stored on-site during the action.	0	•	0	0
Management of military munitions	40 CFR 266, Subpart M	Describes when military munitions are exempt from being managed as solid or hazardous waste.	Not anticipated to be an ARAR, as munitions response actions generally require ex situ actions.	0	0	0	0
Probable ARAR O Pot	ential ARAR O Not like	ly ARAR					

TABLE 9. EXAMPLE FEDERAL ARARS FOR SEDIMENT AND MUNITIONS EX SITU TREATMENT

_				Dredging and Ex Situ Treatment							
ARAR	Location of Federal Citation*	Description	Comments	De-watering	Sediment Washing	On-site Disposal/ Consolidation*	Contained Aquatic Disposal	Stabilization/ Solidification	Vapor Extraction	Thermal Treatment	
Example Technologies				Geotube, Polymer Amendment	Surfactant or Cosolvent Washing	Installation Disposal Unit (On-site Landfill)	Underwater Landfill	Amendment, Injection, Mixing	Venting, Vacuum Extraction	Incineration, Open Burn/ Open Detonation, Pyrolysis, Desorption	
Chemical-Specific											
Federal Maximum Contaminant Levels	40 CFR 141	Sets maximum concentrations allowable for contaminants in sources of drinking water.	Only an ARAR if the action also addresses groundwater.	0	0	0	0	0	0	0	
Discharge of Effluent (on- site discharge of CERCLA waste only)	40 CFR 122 and state regulations approved under 40 CFR 131; 40 CFR 125; 40 CFR 136;	Sets requirements for on-site discharges of treated wastewater to surface water.	This is an ARAR if the action requires compliance with surface water quality standards.	o	0	o	ο	o	ο	ο	
Land Disposal Restrictions	40 CFR 268	Establishes treatment concentrations that must be met prior to on-site disposal of hazardous wastes.	Would be an ARAR for all ex situ actions where wastes are treated ex situ and are subsequently disposed on-site.	o	ο	0	o	o	ο	ο	
Clean Air Act (CAA) emissions	40 CFR 50, 61	Establishes limits on the amounts of pollutants than can be discharged to the air from specified sources.	Not typically an ARAR as emissions from remediation systems are generally exempt from CAA regulations.	ο	ο	0	ο	o	ο	ο	
Emissions from hazardous waste processes	40 CFR 264; Subparts AA, BB, and CC	Establishes limits on the amounts of pollutants than can be discharged to the air from hazardous waste processes.	Only an ARAR if an emissions trigger the need for air pollution control.	ο	ο	o	0	0	٠	•	
Location-Specific											
Migratory Bird Treaty Act	16 USC 703	Protects almost all species of native birds in the United States from unregulated taking.	Almost always an ARAR because a migratory species is almost always present.	•	•	٠	•	•	•	•	
Coastal Zone Management Act	15 CFR 930	Federal activities must be consistent with, to the maximum extent practicable, state coastal zone management programs.	Only an ARAR if "actions will affect" the coastal zone, as defined by the state. Federal lands are excluded from the definition of "coastal zone."	٠	٠	•	•	•	٠	•	
Disturbance of Wetlands (CWA)	40 CFR 230, 33 CFR 320	Provides specific requirements for mitigation when an action results in a permanent loss of wetlands. Prohibits certain activities in wetland areas.	Only an ARAR if there is a wetland on-site.	0	0	0	0	0	0	0	
National Historic Preservation Act	16 USC 470	Requires protection of historical and cultural resources to the maximum extent practicable.	Only an ARAR if there are identified historical or cultural resources on-site.	ο	ο	0	ο	o	ο	ο	
Endangered Species Act	50 CFR 402	Requires protection of threatened and endangered species and habitat.	Only an ARAR if there are identified threatened or endangered species on-site. The federal government is not subject to state laws regarding threatened and endangered species; however, many times, DoD will voluntarily comply. Performing work in accordance with the INRMP at an active installation would constitute compliance.	0	0	0	0	0	0	ο	
Action-Specific											
Non-hazardous waste management (RCRA)	40 CFR 258	Provides standards for the management of non-hazardous wastes.	Almost always an ARAR for on-site waste management.	•	•	•	•	•	•	•	
Hazardous waste management (RCRA)	40 CFR 264.171-175 or 40 CFR 262.34(a) incorporating 40 CFR 265.171-174 by reference	Provides standards for the management of hazardous wastes.	Only an ARAR when on-site hazardous waste management is anticipated.	0	0	0	0	0	0	ο	

TABLE 9. EXAMPLE FEDERAL ARARS FOR SEDIMENT AND MUNITIONS EX SITU TREATMENT (CONTINUED)

ARAR	Location of Federal Citation*	Description	Comments	Dredging and Ex Situ Treatment							
				De-watering	Sediment Washing	On-site Disposal/ Consolidation*	Contained Aquatic Disposal	Stabilization/ Solidification	Vapor Extraction	Thermal Treatment	
Example Technologies				Geotube, Polymer Amendment	Surfactant or Cosolvent Washing	Installation Disposal Unit (On-site Landfill)	Underwater Landfill	Amendment, Injection, Mixing	Venting, Vacuum Extraction	Incineration, Open Burn/ Open Detonation, Pyrolysis, Desorption	
Closure criteria for unregulated dump (RCRA)	40 CFR 258, Subpart A	Indicates prohibited conditions for sites where disposal occurred prior to regulation.	This is an ARAR when waste disposal occurred on-site prior to waste regulation and dredged sediment was consolidated within this area.	0	0	0	0	0	0	0	
Cap design criteria for non- hazardous waste landfill (RCRA)	40 CFR 258, Subpart F	Indicates performance standards for non- hazardous waste landfill caps.	Only an ARAR when non-hazardous waste disposal occurred on-site after waste regulation (varies per state).	0	0	0	0	0	0	0	
Cap design criteria for hazardous waste landfill (RCRA)	40 CFR 264.117(c), 228(a) and (b), 310(a) and (b)	Indicates performance standards for hazardous waste landfill caps.	Only an ARAR when hazardous waste disposal occurred on-site after waste regulation (varies per state).	0	0	0	0	0	0	0	
Discharge of dredge and fill to waters of the United States (CWA)	33 CFR 320 - 330	Indicates prohibitions on dredge and fill of waters of the United States, including wetlands.	This is an action-specific ARAR If wetlands/waters of the United States are disturbed on-site by the action.	•	•	٠	•	•	٠	•	
Management of an on- site water treatment plant (CWA/SDWA)	40 CFR 125	Requirements for the management of a water treatment plant.	This may be an ARAR if an on-site water treatment system is needed to implement the action.	ο	ο	0	0	ο	0	ο	
Treatment of hazardous waste (RCRA)	40 CFR 264	Requirements and performance standards for treating and storing hazardous wastes in on-site units.	May be an ARAR for treatment facilities that are constructed on-site.	ο	ο	ο	0	ο	ο	ο	
Land disposal restrictions (RCRA)	40 CFR 268	Specifies treatment standards and technologies for specific hazardous wastes. This is only an ARAR if hazardous wastes will undergo on-site treatment.	This is an ARAR for all ex situ actions where wastes are treated ex situ and are subsequently disposed on-site.	ο	ο	0	0	ο	0	0	
Underground Injection Control (CWA)	40 CFR 144, 146, and 147	Regulates the subsurface emplacement of fluids (including air) with standards for the design and operation of five classes of injection wells.	Not anticipated to be an ARAR for ex situ actions.	0	0	0	0	0	0	0	
PCB waste management (TSCA)	40 CFR 761	Regulates the management and disposal of PCB-contaminated articles and remediation wastes.	CERCLA actions are not subject to the remediation requirements of TSCA, although the standards may be integrated at the discretion of the lead agent.	ο	0	ο	0	ο	0	ο	
Asbestos	40 CFR 61, Subpart M	Regulates the management and disposal of asbestos or asbestos-containing material.	Only an ARAR if friable asbestos is present on-site. Although not applicable to CERCLA sites, requirements in these sections may be relevant and appropriate to Superfund cleanup activities when they are sufficiently similar to the site situation and appropriate to the circumstances of the release.	o	o	ο	0	o	0	o	
Fugitive Dust Emissions	40 CFR 63	Regulates the generation of fugitive dust emissions during any on-site activity (i.e., not limited to specific sources).	Typically an ARAR as sediment will likely be disturbed as part of an ex situ action and dust control is generally required.	ο	0	•	0	•	•	•	
Erosion and Sediment Control (NPDES program)	40 CFR 122	Regulates point-source discharges of stormwater pollutants to surface water.	Likely an ARAR when sediment is disturbed, resulting in potential erosion.	•	•	•	0	•	•	•	
Oil Storage (SPCC)	40 CFR 112	Regulates the on-site management of petroleum and non-petroleum oils.	Only an ARAR if more than 1,320 gallons of oil are stored on-site during the action.	0	0	0	0	ο	0	ο	
Management of military munitions	40 CFR 266, Subpart M	Describes when military munitions are exempt from being managed as solid or hazardous waste.	Only an ARAR for management of unused military munitions that have been disposed of, or fired/used military munitions that have been removed from a range. There are generally no ARARs for demilitarization.	0	ο	0	0	ο	0	o	

Probable ARAR
 O Potential ARAR
 O Not likely ARAR

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