

## 6.0 List of Applicable or Relevant and Appropriate Requirements and Performance Standards

### 6.1 Overview

Under CERCLA, remedial actions designed to clean up or abate contaminants in the groundwater or in soils, must be designed, constructed and operated to comply with all federal and more stringent state ARARs. ARARs include both federal requirements under any federal environmental law and state requirements under state environmental or facility-siting laws which are more stringent than federal requirements and that have been identified by the State of California in a timely manner.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. Relevant and appropriate requirements include those that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, nevertheless address problems or situations sufficiently similar to those encountered at the CERCLA site to indicate their use is well suited to the particular site. If a given requirement is both relevant and appropriate to a particular site, it constitutes a valid legal requirement for that site. A requirement must either be applicable or both relevant and appropriate to be an ARAR. If no ARAR addresses a particular situation, or if an ARAR is insufficient to protect human health or the environment, then non-promulgated standards, criteria, guidance, and to be considered (TBC) advisories are identified as additional performance standards in the ROD.

In general, onsite actions need to comply only with the substantive aspects of these requirements, not with corresponding administrative requirements (such as, but not limited to, permits, recordkeeping, and reporting).

All laws and statutes identified as ARARs for a particular site or action must be considered and applied during the design, construction, and operation of any remedial action at the particular site. ARARs are identified on a site-specific basis from data and information concerning that site. Data and information concerning the objectives of site remediation, specific actions that are being considered as remedies at that site, the hazardous substances located upon the site, the physical and geological characteristics of the site, and the potential human and ecological receptors at or near the site must be analyzed and considered in order to properly identify ARARs at a particular site. All federal and more stringent state requirements that address or impact any of these conditions must be included as site ARARs.

The three categories of ARARs are described below:

**Chemical-Specific ARARs** establish numerical values or provide methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. The Air Force developed these ARARs by identifying the contaminants at a site which pose a threat to human health or the environment and must be remediated. Chemical-specific ARARs determine acceptable concentrations of specific hazardous substances, pollutants,

and contaminants in the environment and establish the levels to which the soil or groundwater at the affected site must be cleaned or restored in order to protect human health and the environment. Chemical specific ARARs also establish the levels at which certain actions must be taken while transporting, treating, or storing hazardous wastes recovered during remediation. .

**Location-Specific ARARs** are designed to protect the unique characteristics of the site or other areas potentially affected by site activities during the design, construction, or operation of remedial activities. Location-specific ARARs place restrictions on the concentration of hazardous substances or the conduct of activities solely because the site occurs in, or may affect, a special location. Some examples include the protection of wetlands and vernal pools; protection of endangered or threatened species and their habitats; and the protection of fish and game from unauthorized taking.

**Action-Specific ARARs** are technologically or activity-based requirements or limitations on the particular remedial actions at the site. Some examples include prohibitions or restrictions against the discharge of chemicals or contaminants to the air, water, or soil and the proper transfer, treatment or storage of chemicals and contaminants.

## 6.2 ARARs Identification, Development, and Evaluation

### 6.2.1 Methodology

As lead agency, the Department of the Air Force has performed each of the following actions consistent with CERCLA and the NCP:

Identified federal ARARs for each remedial action alternative addressed in the WABOU FS, taking into account site-specific conditions found in the WABOU.

Reviewed potential state ARARs identified by the state in order to determine whether each potential ARAR satisfied CERCLA and NCP criteria that must be met in order to qualify as state ARARs.

Evaluated and compared federal ARARs and their state counterparts in order to determine which state ARARs are more stringent or are in addition to the federal ARARs.

Reached a conclusion as to which federal and state requirements were the most stringent ARARs for each alternative.

### 6.2.2 Solicitation, Identification, and Evaluation of State ARARs

The Department of the Air Force followed the procedures of the process set forth in 40 CFR Section 300.515 and the Travis AFB FFA for remedial actions in seeking state assistance in identification of state ARARs.

The CERCLA, NCP, and FFA requirements for remedial actions provide that the lead federal agency request that the state identify chemical-specific and location-specific state ARARs. The Air Force requested chemical-, location-, and action-specific ARARs from DTSC on 20 February 1997. The request letter included as an attachment the ARARs tables developed during the NEWIOU FS. These tables were developed using responses from:

- California Integrated Waste Management Board
- Department of Toxic Substances Control Board

- State Water Resources Control Board
- California Regional Water Resources Control Board
- Bay Area Air Quality Management District
- California Department of Fish and Game

With few exceptions, the site conditions at both operable units are similar, so this approach was used to simplify the WABOU ARARs selection process for both the state and the Air Force. The tables were made available so that the state could identify additional requirements, if any, to be included as ARARs, or identify those requirements which were not applicable to the WABOU. The state did identify additional requirements that address radiological remediation sites and actions.

During the review and analysis of ARARs identified by the state, and following considerable discussion with the representatives from the various state agencies, many of the requirements identified by the state as potential ARARs were determined to be valid ARARs by the Air Force. These ARARs are presented in this section of the WABOU Interim Groundwater ROD. However, there are a few issues between the Air Force and the State concerning final groundwater cleanup levels based on the scope and/or applicability of several potential groundwater ARARs which have not yet been resolved. These potential ARARs may impact the duration of cleanup activity at the four WABOU groundwater sites and are discussed in more detail in Section 6.4.3.

## 6.3 Determination of ARARs

### 6.3.1 Methodology

The ARARs identified in this section have been used to establish the requirements for WABOU sites and interim remedial alternatives. The ARARs in this section identify those requirements that are applicable or relevant and appropriate to groundwater remediation, those that had no relevancy were excluded. Specifically excluded were:

1. Location-specific requirements addressing conditions not present at WABOU remediation sites.
2. Chemical-specific requirements for COCs not present at WABOU remediation sites.
3. Action-specific requirements for remedial alternatives not utilized at WABOU remediation sites.

The list of ARARs for WABOU sites and groundwater remedial actions is provided in Tables 6-1 through 6-5.

## 6.4 ARARs Evaluation and Discussion

### 6.4.1 Action-Specific ARARs

These ARARs place restrictions on remedial activities that may negatively impact the surrounding environment. The WABOU groundwater remedial alternatives were analyzed to identify potential impacts to the environment. Considered were:

- **Hazardous Waste Treatment, Storage and Disposal Requirements** – These requirements are technology or activity-based requirements that place limitations on actions taken with respect to the hazardous waste. Regulations promulgated under the

applicable provisions of the state authorized federal RCRA and more stringent provisions of the California Hazardous Waste Control Law (HWCL) are relevant and appropriate to RCRA-permitted storage facilities and proper characterization of hazardous waste, and storage and disposal of such waste. If any hazardous wastes are identified which will be transported offsite, they will be disposed of and handled under applicable provisions of the state authorized federal RCRA program.

Many of the HWCL provisions are either applicable or relevant and appropriate because they describe requirements for the safe handling of contaminated materials and precautions for preventing further contamination. These requirements are identified in Table 6-1.

- **Air Resources Requirements**—State legislation divides the state into local air pollution control districts and allows each district to enforce the requirements of the California Clean Air Act within its jurisdictional boundaries. Travis AFB is located in the Bay Area Air Quality Management District (BAAQMD). The applicable air regulations incorporated into the WABOU Groundwater IROD as ARARs are identified in Table 6-2. In addition, most of the rules in the State Implementation Plan (SIP), adopted pursuant to the Federal Clean Air Act, are federal ARARs. Table 6-2 contains a brief description of the substantive requirements and their applicability to the site, remedial action, or technology used to clean up the site.
- **Water Resources Requirements**—Several California statutes and regulations that protect the waters of the State have been identified and incorporated as ARARs. These ARARs establish the remedial objectives and requirements for COCs present at WABOU groundwater remediation sites.

The Porter-Cologne Water Quality Control Act (PCWQCA) is one of the statutory bases for regulation of discharges of waste to land that could impair either surface water or groundwater quality in California. It establishes the authority of the state through its regional water quality control boards to protect the quality of surface water and groundwater. Regulations promulgated pursuant to the PCWQCA are identified in Table 6-3. A further discussion of water remediation requirements is included in the chemical-specific ARARs section to follow.

- **Groundwater Extraction Treatment and Discharge Requirements**—The extraction of groundwater at LF008, DP039, and SS041/SD043 will result in a reduction in the local groundwater levels. However, these changes in groundwater levels have been determined to not have a significant impact on the local vernal pools surrounding these sites. The increase flow rates in Union Creek due to the surface discharge of treated water was also considered and determined to not significantly impact Union Creek.

#### 6.4.2 Location-Specific ARARs

These ARARs place restrictions on remedial activities that may be conducted onsite because of the presence of unique site features. The location of the WABOU groundwater sites and surrounding areas were analyzed for unique site features to identify ARARs. The unique site features considered were:

- **Habitats of Rare, Threatened, Endangered, and Special-Status Species**— Vernal pools which may contain an endangered species, including the Vernal Pool Tadpole Shrimp and the Vernal Pool Fairy Shrimp, have been identified. Other endangered species, including the Black-Shouldered Kite, Boggs Lake Dodder, Burrowing Owl, Coopers Hawk, California Gull, Golden Eagle, Loggerhead Shrike, Northern Harrier, Red Fox, Tri-colored Blackbird, Contra Costa Goldfields, Northwestern Pond Turtle, San Francisco Forktail Damselfly have been observed at least once at Travis AFB and have the potential to be found at WABOU sites.

Several federal ARARs were identified which impact site ecology. The Endangered Species Act and implementing regulations set forth in Table 6-4 apply to those remedial actions at WABOU sites where impacts to endangered wildlife could occur. The operation of groundwater treatment facilities is not expected to impact any endangered species; however, the construction of pipelines for groundwater extraction and other intrusive remedial support activities could affect those resources that are present. To ensure that regulatory requirements are followed and impacts are avoided or mitigated, all sites will be surveyed in consultation with the U.S. Fish and Wildlife Service for the presence of these resources prior to the commencement of remedial activities. This consultation will begin after all necessary site-specific data concerning the construction and operation of the groundwater treatment equipment become available.

Several more stringent state ARARs protective of site ecology have also been identified. The California Fish and Game Code (CFGF) and regulations promulgated under this Code, which protect rare, endangered, or threatened species or habitats, require alternative actions at sites where impacts have the potential to occur. These requirements are provided in Table 6-5. In addition to these state counterparts to the Endangered Species Act, the CFGF also establishes several requirements to protect site wildlife by prohibiting or restricting the unauthorized taking of other wildlife. The CFGF also regulates to protect aquatic life living in the waters of the state. All remedial activities that have the potential to cause a discharge to any stream lake or other body of water must comply with the requirements of the CFGF. U.S. EPA does not acknowledge that all CFGF requirements are more stringent than federal requirements but concurs with the Air force decision to comply with both federal and state requirements as ARARs in this IROD. CFGF ARARs are found in Table 6-5.

- **Historically or Culturally Significant Properties**—Some buildings on Travis AFB have recently been identified as Cold War Era buildings and historically significant. However, none of these buildings are affected by WABOU remedial activities.
- **Wilderness Areas, Wild and Scenic Rivers, and Coastal Zones**—No wilderness areas, wild and scenic rivers, or coastal zones exist within the boundaries of Travis AFB. Therefore, requirements related to these areas are not applicable or relevant to WABOU sites and actions.
- **Earthquake Faults**—Although the Vaca-Winters and the Vaca-Kirby faults are located in the Travis AFB area, WABOU sites are not located on these faults.

### 6.4.3 Chemical-Specific ARARs

**Discharges of Effluent to Surface Water**—Surface water at Travis AFB includes Union Creek which is a minor tributary to the Suisun Marsh. However, design, construction, and operation of remedial actions will have a negligible impact upon surface water. One of the options at all sites for which groundwater treatment has been selected is the discharge of treated groundwater to Union Creek. Provisions of 40 CFR Part 122 regulate discharge to surface waters. NPDES requirements establish standards for discharges to surface waters of the United States, and are provided in Table 6-6. The substantive CRWQCB requirements of federal or more stringent state ARARs for discharge of treated effluent to surface waters are included in Table 6-7.

**Discharges of Effluent to Groundwater**—The reinjection of treated groundwater is not a representative process option and has not been incorporated into any of the selected remedial alternatives identified in the WABOU Groundwater IROD.

**Discharge of Effluent to Land**—Irrigation is the designated beneficial use of treated groundwater at Travis AFB. The use of reclaimed and treated groundwater for irrigation activities shall meet the substantive standards set forth by the regional water quality control board order which establishes the general discharge requirements for treated groundwater. These standards ensure that reclaimed water is segregated from potable water sources and does not migrate or escape from the area of irrigation. Table 6-8 provides a list of the effluent treatment levels for beneficial use.

**Aquifer Remediation Objectives**—The State Water Resources Control Board (SWRCB) Resolution 92-49, Section III.G is a requirement for the establishment of final aquifer cleanup levels. However, the Air Force does not agree with the state on the full applicability of all the substantive requirements of this resolution and its impacts on the remedial actions and activities. Because final aquifer cleanup levels are not established in this IROD, this requirement is not an ARAR. The purpose of using an IROD in lieu of a ROD is to prevent the delay of remedial actions that would have resulted from this disagreement and to obtain the data needed to resolve this disagreement.

SWRCB Resolution 68-16 has been identified by the State as an ARAR for the protection of both surface water and groundwater of the state. All parties agree that this resolution is an ARAR with respect to active discharges of treated effluent to surface waters. However, the Air Force and U.S. EPA do not agree with the state on the full applicability of all the substantive requirements of this resolution and its impacts on the remedial action activities.

**Table 6-1  
Travis AFB - WABOU Groundwater Sites  
Federal ARARs\***

**Waste Transfer, Treatment, and Storage and Disposal Requirements**

**\* (California Statutes and Regulations Comprising Federal Authorized RCRA Program)**

<b>Source</b>	<b>Requirement, Standard, or Criterion</b>	<b>Type</b>	<b>Description</b>	<b>Remarks</b>	<b>Sites and Alternatives</b>	
Title 22 CCR Chap 12, Art 1	66262.11	Applicable	Requires a facility to determine as to whether waste is hazardous.	Applicable to wastes excavated or resulting from treatment processes.	08, 39, 41, 43	G3, G4, G5, G6
Title 22 CCR Chap 14 Art 6	66264.94	Applicable	Establishes general groundwater monitoring requirements and concentration limits.	Applicable at groundwater sites for development of a comprehensive monitoring program for the site	08, 39, 41, 43	G3, G4, G5, G6
	66264.96(c)	Applicable	Establishes monitoring requirements upon removal of waste/contaminated material from a management unit. Requires monitoring showing compliance with water quality standards for 3 consecutive years.			
	66264.97	Applicable	Establishes groundwater monitoring requirements during closure and post-closure periods.			
Title 22 CCR Chap 14, Art 9 (Standards for Owners and Operators of Hazardous Waste Transfer, Storage, and Treatment, Disposal Facilities - Management of Containers)	66264.171	Relevant and Appropriate	Sets standards for containers holding hazardous waste or chemicals recovered from sediments, surface soils, or groundwater.	Sections in this article are relevant and appropriate to sites or actions where waste containers are used. Containers will be used to transfer and store wastes generated from construction activities or the operation of remedial actions. Examples would include spent carbon from treatment plants, drill cuttings from well installation, free product removed from a plume, etc.	08, 39, 41, 43	G3, G4, G5, G6
	66264.172	Relevant and Appropriate	Requires use of containers that are compatible with the recovered material for the storage of that material.			
	66264.173	Relevant and Appropriate	Requires containers used to transport material to be closed during transport and that waste be handled to minimize damage to containers.			
	66264.174	Relevant and Appropriate	Establishes requirements for inspecting containers weekly.			
	66264.175	Relevant and Appropriate	Establishes requirement for adequate secondary containment of stored waste.			
	66264.176	Relevant and Appropriate	Requires isolating waste from sources of ignition if waste is ignitable.			
	66264.177	Relevant and Appropriate	Requires segregation of waste from incompatible waste.			
	66264.178	Relevant and Appropriate	Establishes the requirement to remove all hazardous waste and waste residue at closure.	Sect 66264.178 is relevant and appropriate when sites are closed and wastes or residue, as described above, are on-site at closure.		

**Table 6-1**  
**Travis AFB - WABOU Groundwater Sites**  
**Federal ARARs\***  
**Waste Transfer, Treatment, and Storage and Disposal Requirements**  
**(continued)**

(continued)

Source	Requirement, Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
Title 22 CCR Chap 14, Art 10  (Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities - Use and Management of Tank Systems)	66264.192	Relevant and Appropriate	Establishes design/installation requirements for new tank systems/components.	Sections in this article are relevant and appropriate to alternatives incorporating the use of tanks or tank systems as part of the remedial equipment. Tanks will be used at treatment plants to store contaminated water prior to treatment. Tanks will also be used for temporary storage of free product, if necessary. Section 66264.197(a), (c)(3), and (c)(4) (cost estimates and financial responsibility requirements) are not ARARs. Section 66264.198 is relevant and appropriate to sites with ignitable waste [i.e., free product] or reactive waste. Remedies utilizing reactive oxidizers, such as ultraviolet oxidation or catalytic oxidation, trigger this requirement.	08, 39, 41, 43	G3, G4, G5, G6
	66264.193	Relevant and Appropriate	Tank system requirements including containment and detection of releases.			
	66264.194	Relevant and Appropriate	Delineates tank system requirements including operating requirements.			
	66264.195	Relevant and Appropriate	Delineates requirements tank systems including inspections.			
	66264.196	Relevant and Appropriate	Delineates tank system requirements including response to leaks or spills.			
	66264.197	Relevant and Appropriate	Delineates tank system requirements including closure and post-closure care.			
	66264.198	Relevant and Appropriate	Delineates requirements for tank systems including special care requirements for reactive wastes.			
	66264.199	Relevant and Appropriate	Delineates special tank system requirements for incompatible wastes.			
Title 22 CCR Chap 14, Art 15  (Standards for Incinerators)	66264.341	Applicable	Requires owner or operator of thermal treatment units to conduct sufficient waste analysis to verify that waste feed to the incinerator is within physical and chemical composition limits	Applicable to remedial actions that utilize thermal treatment units. Only the substantive requirements set forth in these sections are ARARs. Permitting requirements set forth in these sections are procedural and not ARARs	08, 39, 41, 43	G4, G5, G6
	66264.342	Applicable	Establishes treatment requirements for Principal Organic Hazardous Constituents (POHCs) in the waste feed.			
	66264.343	Applicable	Establishes construction, maintenance and performance standards for incinerators that burn hazardous waste.			
	66264.344 (a)	Applicable	Establishes operating conditions under which hazardous wastes may be burned.			
	66264.345	Applicable	Establishes operating requirements under which hazardous wastes may be burned.			
	66264.347	Applicable	Establishes inspection and monitoring requirements for incinerators.			



**Table 6-1**  
**Travis AFB - WABOU Groundwater Sites**  
**Federal ARARs\***  
**Waste Transfer, Treatment, and Storage and Disposal Requirements**  
**(continued)**

Source	Requirement, Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
Title 22 CCR Chap 14, Art 16	66264.601	Applicable	Specifies performance standards for miscellaneous units that transfer, treat, store or dispose of hazardous waste.	Applicable at Travis AFB sites where air strippers or dual-phase extraction are used as part of the remedial action. Section 66264.602 requirements related to response and reporting procedures are not ARARs.	08, 39, 41, 43	G4, G5, G6
	66264.602	Applicable	Establishes analysis, inspection, response, reporting, monitoring and corrective action standards for miscellaneous units.			
	66264.603	Applicable	Establishes maintenance standards for miscellaneous units.			
Title 22 CCR Chap 14, Art 27 (Air Emission Standards for Process Vents)	66264.1032	Relevant and Appropriate	Establishes emission limits when process vents are used.	Relevant and appropriate to alternatives where closed vent systems are used. This includes sites with remediation systems that have system vents, to include air strippers, UV oxidation, carbon treatment vessels and catalytic oxidation equipment.	08, 39, 41, 43	G3, G4, G5, G6
	66264.1033	Relevant and Appropriate	Establishes standards for closed vent systems and control devices.			
	66264.1034	Relevant and Appropriate	Establishes test methods and procedures for closed vent systems.			
	66264.1035	Relevant and Appropriate	Establishes record keeping requirements; performance & design analysis/ parameters for closed vent systems;			
Title 22 CCR Chap 14, Art 28  (Air Emission Standards for Equipment Leaks)	66264.1054	Relevant and Appropriate	Establishes that pressure relief devices in gas/vapor service shall be operated with no detectable emissions.	Relevant and appropriate for actions where gas/vapor extraction systems are used.	39	G5, G6
	66264.1063	Relevant and Appropriate	Establishes leak detection monitoring requirements.			
	66264.1064	Relevant and Appropriate	Establishes record keeping requirements for gas/vapors extraction systems.			
Title 22 CCR Chap 18, Art 1  (Land Disposal Restrictions - General)	66268.3	Applicable	Establishes land disposal restrictions, including a prohibition of using dilution as a substitute for treatment.	Applies to hazardous waste generation from site excavation or from site construction activities. Restricts on-site disposal activities in unauthorized areas.	08, 39, 41, 43,	G3, G4, G5, G6
	66268.7	Applicable	Establishes land disposal restrictions, including requirements for waste analysis and record keeping.			
	66268.9	Applicable	Establishes land disposal restrictions including special rules for wastes that exhibit a characteristic.	Section 66268.7, para (a)(1), (b)(1), (2) and (3), and (c)(2) are substantive requirements. The remainder of the section is procedural and not ARARs.		

**Table 6-1**  
**Travis AFB - WABOU Groundwater Sites**  
**Federal ARARs\***  
**Waste Transfer, Treatment, and Storage and Disposal Requirements**  
**(continued)**

Source	Requirement, Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
Title 22 CCR Chap 18, Art 2	All Sections	Applicable	Establishes treatment technology for disposal of waste to land for RCRA and non-RCRA wastes identified in section 66268.106.	Applicable to sites where material, state regulated waste, or secondary hazardous waste is generated during construction activities (to include excavation for well installation, pipeline installation, and foundations for treatment facilities). Wastes identified will be managed in accordance with these standards.	08, 39, 41, 43,	G3, G4, G5, G6
Title 22 CCR, Chap 18 Art 3	66268.30	Applicable	Establishes waste-specific LDRs	Applicable to groundwater sites where media excavated for equipment installation is classified as hazardous waste and disposed/ treated on-site. Applicable to wastes excavated or removed from soil sites. Requires identification of waste through the proper characterization process.	08, 39, 41, 43	G2, G3, G4, G5, G6
	66268.31	Applicable	Establishes LDRs for wastes containing dioxin.			
	66268.32	Applicable	Establishes LDRs for certain hazardous wastes.			
	66268.33	Applicable	Establishes LDRs - First Third Wastes.			
	66268.34	Applicable	Establishes LDRs - Second Third Wastes.			
	66268.35	Applicable	Establishes LDRs - Third Third Wastes.			
Title 22 CCR, Chap 18 Art 3	66268.36	Applicable	Prohibits land disposal of newly listed wastes.			
	66268.37	Applicable	Prohibits land disposal of corrosive and characteristic wastes with vacated treatment standards.			
	66268.38	Applicable	Identifies waste specific prohibitions on newly identified organic toxicity characteristic wastes & newly listed coke by-product and chlorotoluene waste.			
Title 22 CCR Chap 18 Art 4	All Sections	Applicable	Identifies treatment standards for halogenated organic compounds regulated by section 66268.32	Applicable to sites where excavated material is classified as hazardous waste. Identified waste will be managed in accordance with these standards, if disposed of on land and not in a CAMU or AOC. Applicable at sites where wastes or contaminated soils are excavated or removed.	08, 39, 41, 43	G2, G3, G4, G5, G6
Title 22 CCR Chap 18 Art 5	All Sections	Applicable	Establishes prohibitions on storage of hazardous wastes restricted under Article 3 of this chapter or RCRA Section 3004 (42 USC 6924).			
Title 22 CCR Chap 18 Art 10	66268.100	Applicable	Establishes land disposal prohibitions for non-RCRA hazardous wastes.			
Title 22 CCR Chap 18 Art 11	All Sections	Applicable	Establishes disposal restrictions, treatment standards, & prohibitions, for certain identified hazardous wastes.			
Title 22 CCR Chapter 43 (Extremely Hazardous Wastes)	67430.3	Applicable	Establishes requirements for the removal of spilled or improperly deposited extremely hazardous wastes.	Applicable to sites where unintentional spills may occur.	08, 39, 41, 43	G2, G3, G4, G5, G6

**Table 6-2**  
**Travis AFB - WABOU Groundwater Sites**  
**State ARARs**  
**Air Remediation Requirements**

Source	Requirement, Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
Regulation 2, Rule 1	308	Applicable	Establishes that fugitive emissions from equipment or facilities must comply with all applicable requirements.	Applicable to actions where air strippers or other systems using pressurized components (UV oxidation, carbon adsorption, catalytic oxidation and ion exchange) may result in fugitive VOC emissions.	08, 39, 41, 43	G3, G4, G5, G6
(Bay Area Air Quality Management District Regulations)	316	Applicable	Establishes maximum levels for toxic air contaminants, which, if exceeded, require a risk screening analysis.	Applicable to actions that have the potential to emit toxic air contaminants (e.g. TCE). Applicable to air stripping, UV oxidation, carbon adsorption, catalytic oxidation and ion exchange.		
	501	Applicable	Establishes that continuous emission monitors meet certain requirements.	Applicable to all sites or actions where air stripping, UV oxidation, carbon adsorption, catalytic oxidation and ion exchange technologies are used in the remedial action.		
Regulation 2, Rule 2	112	Applicable	Establishes exemptions for secondary pollutant emissions from abatement control equipment that complies with BACT or BARCT requirements.	Applicable to actions where BARCT or BACT abatement devices are used (i.e. carbon adsorption is used together with catalytic oxidation or UV oxidation or ion exchange) but where secondary emissions from the abatement equipment still exist.	08, 39	G4, G5, G6
	301	Applicable	Establishes BACT requirement for new sources emitted in excess of 10 lbs/day of non-precursor organic compounds, precursor organic compounds, NOx, SOx, PM-10, CO <sub>2</sub> .	Applicable to actions with potential to discharge to air. Not applicable for permitting requirements or authority to construct. Applicable for determining the applicability of BACT to a new source. Remedial alternatives using air strippers must ensure BACT is used (i.e. catalytic oxidation with carbon adsorption) to control emissions in excess of levels specified in the rule.		
Regulation 6	301	Applicable	Establishes limitations on visible emissions and opacity.	Applicable to sites where excavation or construction activities have the potential to release particulate matter into the air (i.e. dirt and dust), or at sites where portable soldering, brazing, welding equipment is used. Also applicable at sites where portable combustion engines of < 25 liters of displacement are used. Applicable to all actions subject to Regulation 6.	08, 39, 41, 43	G3, G4, G5, G6
	302	Applicable	Establishes limitations on opacity.			
	303	Applicable	Establishes limitations on emission rates, concentration, visible emissions and opacity.			
	501	Applicable	Establishes requirements for sampling facilities and instruments.			

**Table 6-3**  
**Travis AFB - WABOU Groundwater Sites**  
**State ARARs**  
**Water Board Requirements**

Source	Requirement Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
Federal Water Pollution Control Act Section 402, Porter Cologne Water Act; California Water Code, Division 7, Sections 13000, 13140, 13240, Water Quality Control Plan for the San Francisco Bay Basin	SWB Resolution 68-16	Applicable	Establishes policy that whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated that any change will be consistent with maximum benefit to the people of the State, won't unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than prescribed in the policies. Discharges or proposed discharges to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that a pollution or nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the State will be maintained.	<p>Applicable to sites where groundwater actions will cause active discharges to surface water (i.e., Union Creek). The Air Force and the U.S. EPA agree to disagree with the RWQCB as to the applicability of this section with respect to passive discharge and plume migration.</p> <p>San Francisco Bay Region Order Number 94-087 establishes requirements for discharge or reuse of extracted and treated groundwater that was contaminated by VOCs.</p> <p>Contaminants in treated groundwater shall not exceed the more stringent of the substantive standards set forth in Order 94-087, MCLs, or such levels necessary to preclude degradation of the receiving water quality. The numeric effluent limitations for discharges of treated water that comply with Resolution 68-16 are specified in Table 6-6. The discharge must also comply with paragraphs A.1, A.2, and A.3 (prohibitions) of General Waste Discharge Order 94-087.</p>	08, 39, 41, 43	G3, G4, G5, G6
Porter Cologne Water Act; CWC Sections 13000, 13140, 13240,	SWB Resolution 88-63	Applicable	Designates all ground and surface water of the state as potential drinking water with certain exceptions (TDS>3,000 ppm and it is not reasonably expected by Regional Boards to supply a public water system, well yield<200 gpd, geothermic resources, waste water conveyance facility, or can't be reasonably treated for domestic use).	Applicable to actions that will result in the discharge of treated groundwater to surface waters (i.e. Union Creek). The existing beneficial uses of Union Creek include navigation, contact and non-contact recreation, fish spawning, warm freshwater habitat, and wildlife habitat.	08, 39, 41, 43	G3, G4, G5, G6

**Table 6-3**  
**Travis AFB - WABOU Groundwater Sites**  
**State ARARs**  
**Water Board Requirement**  
**(continued)**

Source	Requirement Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
Title 27 CCR  (CWC Section 13140 - 13147, 13260, 13263, 13267, 13304)	20090 (d)	Relevant and Appropriate	Establishes exemption from provisions of this subchapter for actions taken by or at the direction of public agencies to clean up or abate conditions of pollution or nuisances resulting from unintentional or unauthorized releases of waste or pollutants to the environment. Requires that wastes, pollutants, or contaminated materials removed from the immediate place of release are discharged according to Art 2. Remedial actions intended to contain such wastes at the place of release shall implement applicable provisions of this subchapter to the extent feasible.	Relevant and appropriate to monitoring requirements and other specific actions that are not related to final cleanup levels or goals at sites where active remediation will occur. The Air Force does not concur with the RWQCB's interpretation that this requirement is applicable to unauthorized or unintentional releases.	08, 39, 41, 43	G3, G4, G5, G6
U.S. Office of Solid Waste	RCRA Groundwater Monitoring, Draft Tech. Guidance, Nov. 1992 (EPA /530-R-93-001)	Performance Standard	Sets forth requirements for the development of a groundwater monitoring program.	Applies to the development of a comprehensive monitoring program for the site (also reference Table 6-1, 22 CCR Section 66264.94, 66264.96, and 66264.97).	08, 39, 41, 43	G3, G4, G5, G6
Regional Water Quality Control Board	S.F. Bay Basin Water Quality Control Plan, Chapter 2, Beneficial Uses.	Applicable	Establishes beneficial uses of surface waters.	Applicable to define beneficial uses of surface waters to which treated effluent is discharged. Beneficial uses of Union Creek and downstream receiving waters include navigation, contact and non-contact recreation, fish spawning, warm freshwater habitat, and wildlife habitat.	08, 39, 41, 43	G3, G4, G5, G6
	S.F. Bay Basin Water Quality Control Plan, Chapter 3, Water Quality Objectives.	Applicable	Establishes discharge to surface requirements, including receiving water quality objectives and receiving water limits.	Applicable where effluent is discharged to the surface. Surface waters shall not contain concentrations of chemical constituents in amounts that affect any beneficial use or the objectives for selected toxic pollutants identified in Tables 3-3 and 3-4.		

**Table 6-4**  
**Travis AFB - WABOU Groundwater Sites**  
**Federal ARARs**

Requirements under the US Code and Related Regulations						
Source	Requirements Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
Title 16 USC  (Endangered Species Act)	1531(c)	Applicable	Requires action to conserve endangered species and critical habitats upon which endangered species depend. Includes consultation with the Dept of Interior.	Activities at remedial sites must be performed in such a manner as to identify the presence of and protect endangered or threatened plants and animals at the site. Species at Travis AFB include the Black-Shouldered Kite, Boggs Lake Dodder, Burrowing Owl, Coopers Hawk, California Gull, Golden Eagle, Loggerhead Shrike, Northern Harrier, Red Fox, Tri-colored Blackbird, Vernal Pool Fairy Shrimp, Contra Costa Goldfields, Northwestern Pond Turtle, San Francisco Forktail Damselfly, Vernal Pool Tadpole Shrimp.	08, 39, 41, 43,	G2, G3, G4, G5, G6
	1536(a)	Applicable				
Title 16 USC  (Fish and Wildlife Coordination Act)	662	Applicable	Regulates site actions affecting fish or wildlife in lakes, stream, or other water bodies by requiring coordination between lead agency and the US Fish and Wildlife Service, Dept. of the Interior, and applicable state agencies.	Applicable to active remediation actions and effluent discharges at sites that are located at or near, or which may impact., Union Creek and pond.	08, 39, 41, 43	G3, G4, G5, G6
Title 16 USC  (Migratory Bird Treaty Act)	703	Applicable	Prohibits unlawful taking, possession, and sale of almost all species of native birds in the U.S.	Species at Travis AFB include Black-Shouldered Kite, Burrowing Owl, Coopers Hawk, California Gull, Golden Eagle, Loggerhead Shrike, Northern Harrier, Tri-colored Blackbird.	08, 39, 41, 43	G2, G3, G4, G5, G6
Federal Clean Water Act, Sect. 404, Title 33 CFR Part 330, Appx A, Subpart B - Army Corps of Engineers Nationwide Permit Program	Paragraph 12	Applicable	Establishes Nationwide Permit for discharges of material for backfill or bedding of utility lines, including outfall and intake structures affecting the waters of the U.S.	The substantive portions of these paragraphs are applicable. The notification requirements are not ARARs. Site activities related to construction and installation of remedial equipment give rise to these requirements.	08, 39, 41, 43	G3, G4, G5, G6
	Paragraph 13	Applicable	Establishes Nationwide Permit for bank stabilization activities required for erosion prevention.			
	Paragraph 27	Applicable	Establishes requirements for activities in waters of the United States associated with restoration of altered and degraded non-tidal wetlands and creation of wetlands on private lands.			

**Table 6-4**  
**Travis AFB - WABOU Groundwater Sites**  
**Federal ARARs**  
**Requirements under the US Code and Related Regulations**  
**(continued)**

Source	Requirement Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
Clean Water Act, Section 404, Title 33 CFR Part 330, Appx A, Sub C Army Corps of Engineers Nationwide Permit Conditions (NWP)	Paragraph 2	Applicable	Requires structures or fill authorized be maintained, including maintenance to ensure public safety.	The substantive portions of these paragraphs are applicable. The notification requirements are not ARARs.	08, 39, 41, 43	G3, G4, G5, G6
	Paragraph 4	Applicable	Requires that no activity may substantially disrupt the movement of those species of aquatic life indigenous to the water body.			
	Paragraph 5	Applicable	Requires heavy equipment working in wetlands must be placed on mats or other measures be taken to minimize soil disturbance			
	Paragraph 11	Applicable	No activity is authorized under any NWP if likely to jeopardize the continued existence of a threatened or endangered species, or species proposed for such designation, as identified under the Endangered Species Act, or if likely to destroy or adversely modify the critical habitat of such species.			
Title 40 CFR Part 122 – EPA Administered Permit Programs: The National Pollutant Discharge Elimination System (NPDES)	122.26	Applicable	Requirements to ensure storm water discharges from remedial activities do not contribute to a violation of surface water quality standards.	Applicable at all sites where there will be discharge to the stormwater system and discharges to Union Creek. These sections relate to effluent limitations and monitoring requirements to be applied during the development of a monitoring plan. The SRWQCB is authorized to implement the NPDES program in the State of California. California Regional Water Quality Control Board, San Francisco Bay Region Order 94-087 establishes substantive discharge standards. Only substantive portions of Part 122 are ARARs; reporting requirements are procedural.	08, 39, 41, 43	G3, G4, G5, G6
	122.41(d)	Applicable	Requires all reasonable steps be taken to minimize or prevent discharges that have a reasonable likelihood of causing adverse impacts on surface water quality.			
	122.41(e)	Applicable	Requires proper operation and maintenance of treatment and control systems/ equipment.			
	122.41(j) (1)(3)&(4)	Applicable	Establishes requirements for monitoring and recordation of monitoring results.			
	122.41(l)(6)	Applicable	Establishes informational requirements for any noncompliance which may endanger health or the environment			
	122.41(m)	Applicable	Establishes prohibitions, limitations and restriction on treatment plant bypass.			
	122.41(n)	Applicable	Defines and establishes parameter for upset conditions in a treatment plant.			

**Table 6-4**  
**Travis AFB - WABOU Groundwater Sites**  
**Federal ARARs**  
**Requirements under the US Code and Related Regulations**  
**(continued)**

Source	Requirement Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
Title 40 CFR Part 122 (Continued)	122.44(d)	Applicable	Requires that discharges to surface water must achieve federal and state water quality standards.	(Continued)	08, 39, 41, 43	G3, G4, G5, G6
	122.44(g)	Applicable	Identifies certain toxic pollutants as hazardous substances.			
	122.44(i)	Applicable	Establishes monitoring requirements to assure compliance with permit limitations and requirements to monitor.			
	122.45(c)	Applicable	Establishes techniques and methodologies for monitoring effluent levels of metals.			
	122.45(d)	Applicable	Establishes format for reporting effluent limitation standards and prohibitions.			
	122.45(e)	Applicable	Establishes format and limit criteria for non-continuous discharge.			
	122.45(f)	Applicable	Establishes requirements and exceptions for pollutants expressed in terms of mass.			
	122.45(g)	Applicable	Establishes credits for pollutants in the discharger's intake water.			
	122.48(a)	Applicable	Establishes requirements for proper use, maintenance, and installation of monitoring equipment or methods.			
	122.48(b)	Applicable	Establishes requirements for monitoring including type, intervals, and frequency sufficient to yield data which are representative of the monitored activity including, when appropriate, continuous monitoring.			
Title 40 CFR Part 141	141.11	Relevant and Appropriate	Establishes the federal allowable maximum contaminant levels (MCLs) for arsenic in community water systems and nitrates in non-community water systems.	Relevant and appropriate to sites where discharge of treated groundwater to potential sources of drinking water will occur. Establishes effluent treatment standards for certain constituents which are not addressed by the substantive requirements of California Regional Water Quality Control Board, SF Bay Region, Order Number 94-087.	08, 39, 41, 43	G3, G4, G5, G6
40 USC Sec. 300 (National Primary Drinking Water Standards)	141.12	Relevant and Appropriate	Establishes federal maximum contaminant levels (MCLs) for trihalomethanes.			
	141.61	Relevant and Appropriate	Establishes MCLs for organic contaminants. Requires the best technology, treatment technique, or other means available for achieving compliance of MCLs contaminants.			
	141.62	Relevant and Appropriate	Establishes MCLs for inorganic contaminants. Requires the best technology, treatment technique, or other means available for achieving compliance of MCLs for identified contaminants, except fluoride.			



**Table 6-4**  
**Travis AFB - WABOU Groundwater Sites**  
**Federal ARARs**  
**Requirements under the US Code and Related Regulations**  
**(continued)**

Source	Requirement Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives
40 CFR Part 230 (Clean Water Act - Disposal of Dredged or Fill Material)	230.10	Applicable	Prohibits discharge of dredged or fill material into waters or wetlands without a permit. Establishes limitations on such discharges.	Applicable to sites where wetlands and vernal pools are located. Permitting requirements are procedural and are not ARARs.	08, 39, 43 G3, G4, G5, G6
	230.71	Applicable	Places limitations/requirements on the disposal and treatment of the dredged or fill material discharged.		
	230.72	Applicable	Establishes requirements and methods for the control of the effects of dredged or fill material after discharge, through use of levees, caps, lined containment areas, timing and placement.		
	230.73	Applicable	Establishes requirements for minimizing discharge effects by use of specific disbursement methods.		
	230.74	Applicable	Requires use of available technology, adapted to the particular site, to minimize the adverse effects of dredge and fill discharges.		
	230.75	Applicable	Requires minimization of adverse effects on populations of plants and animals caused by the discharge of dredge or fill materials.		
	230.76	Applicable	Requires use of fill or dredge material discharge methods that minimize the adverse effects on human use potential.		

**Table 6-5**  
**Travis AFB - WABOU Groundwater Sites**  
**State ARARs**  
**Fish and Game Requirements**

Source	Requirement, Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
California Fish and Game Code	1908	Applicable	Prohibits the possession, import, or taking of rare or endangered native plants.	Applies to active remediation sites where rare or endangered native plants exist. Requires site surveys prior to action to determine presence of endangered/threatened plants at the site and consideration of potential impact.	08, 39, 41, 43	G2, G3, G4, G5, G6
	2080	Applicable	Prohibits the import, taking or sale of threatened or endangered native plants			
	2090	Relevant and Appropriate	Requires state lead agencies to consult with DF&G to ensure authorized actions will not jeopardized endangered or threatened species.			
	2091	Relevant and Appropriate	Requires state agencies to use alternative actions where impact to threatened or endangered species or habitat is found.			
	2092	Relevant and Appropriate	Requires state agencies to adopt reasonable alternative actions where project would result in the extinction of a species.			
	3005	Applicable	Prohibits taking of birds or animals with net, pound, cage, trap, set line, wire, or poison.	Applicable at all remediation sites where birds, animals, or other wildlife identified by the applicable statutory provision exist. Applicable to the extent that these laws are more stringent than the Federal Endangered Species Act or Migratory Bird Treat Act.		
	3511	Applicable	Prohibits taking of birds identified as “fully protected.”			
	3513	Applicable	Prohibits taking of protected migratory non-game birds.			
	4700	Applicable	Prohibits taking or possession of mammals identified as “fully protected.”			
	5050	Applicable	Prohibits taking or possession of reptiles/ amphibians identified as “fully protected.”			
	5515	Applicable	Prohibits taking or possession of fish identified as “fully protected.”			
	5650	Applicable	Prohibits deposit or placement of specified materials and substances into places where is can pass into the waters of the state.	Applicable to all remediation actions or sites where substances have a pathway to state waters.		

**Table 6-5**  
**Travis AFB - WABOU Groundwater Sites**  
**State ARARs**  
**Fish and Game Requirement**  
**(continued)**

Source	Requirement, Standard, or Criterion	Type	Description	Remarks	Sites and Alternatives	
Title 14 CCR	40.00	Applicable	Prohibits the taking or possession of native reptiles and amphibians.	Applicable to all site and action alternatives where identified mammals, fish, reptiles or amphibians or plants exist. Will be considered at all sites where active remediation occurs. Requires site surveys prior to action to determine presence of endangered/threatened plants at the site. Section 640 will be considered to the extent feasible and consistent with CERCLA planning documents. Species found at Travis AFB which are covered by these sections include the Black-Shouldered Kite, Boggs Lake Dodder, Burrowing Owl, Coopers Hawk, California Gull, Golden Eagle, Loggerhead Shrike, Northern Harrier, Red Fox, Tri-colored Blackbird, Vernal Pool Fairy Shrimp, Contra Costa Goldfields, Northwestern Pond Turtle, San Francisco Forktail Damselfly, Vernal Pool Tadpole Shrimp.	08, 39, 41, 43	G2, G3, G4, G5, G6
	40.10	Applicable	Prohibits the possession or taking of native reptiles and amphibians.			
	460	Applicable	Prohibits the taking of certain fur bearing mammals at any time.			
	640	Applicable	Establishes requirement for fish and wildlife planning to optimize fish and wildlife resources.			
	670.2	Applicable	Establishes species, subspecies, and varieties of native California plants as endangered, threatened, or rare.			
	670.5	Applicable	Establishes species, subspecies, and varieties of native California plants as endangered, threatened, or rare.			

TABLE 6-6  
NPDES Effluent Limitations for Treated Groundwater

Constituent	Instantaneous Maximum (µg/L)	30-Day Median (µg/L)
<b>Halogenated Volatile Organics<sup>a</sup></b>		
Bromodichloromethane	100.0 <sup>b</sup>	0.5
Carbon Tetrachloride	0.5 <sup>b</sup>	0.5
Chlorobenzene	70.0 <sup>b</sup>	0.5
Chloroform	100.0 <sup>b</sup>	0.5
Chloromethane		0.5
Dibromochloromethane	100.0 <sup>b</sup>	0.5
1,4-Dichlorobenzene	5.0 <sup>b</sup>	0.5
1,2-Dichloroethane	0.5 <sup>b</sup>	0.5
1,1-Dichloroethylene	6.0 <sup>b</sup>	0.5
cis-1,2-Dichloroethylene	6.0 <sup>b</sup>	0.5
trans-1,2-Dichloroethylene	10.0 <sup>b</sup>	0.5
1,2-Dichloropropane	5.0 <sup>b</sup>	0.5
Ethylene Dibromide	0.05 <sup>b</sup>	0.5
Tetrachloroethylene (PCE)	5.0 <sup>b</sup>	0.5
Trichloroethylene (TCE)	5.0 <sup>b</sup>	0.5
Vinyl Chloride	0.5 <sup>b</sup>	0.5
<b>Total Halogenated Volatile Organics</b>		1.0
<b>Non-Halogenated Volatile Organics</b>		
Benzene	1.0 <sup>b</sup>	0.5
Ethylbenzene	29.0 <sup>c</sup>	0.5
Toluene	42.0 <sup>c</sup>	0.5
Xylenes	17.0 <sup>c</sup>	0.5
TPH - Gasoline	50.0 <sup>d</sup>	50.0 <sup>d</sup>
<b>Semi-Volatile Organics<sup>e,f</sup></b>		
Aldrin	1.4 x 10 <sup>-4</sup>	1.4 x 10 <sup>-4</sup>
Alpha-BHC	0.013	0.013
Beta-BHC	0.046	0.046
Gamma-BHC (Lindane)	0.063	0.063
Chlordane	5.9 x 10 <sup>-4</sup>	5.9 x 10 <sup>-4</sup>
4,4'DDT	6.0 x 10 <sup>-4</sup>	6.0 x 10 <sup>-4</sup>
4,4'DDD	8.4 x 10 <sup>-4</sup>	8.4 x 10 <sup>-4</sup>
Dieldrin	1.4 x 10 <sup>-4</sup>	1.4 x 10 <sup>-4</sup>
2,3,7,8-TCDD (Dioxins)	1.4 x 10 <sup>-8</sup>	1.4 x 10 <sup>-8</sup>
Endosulfan	2.0	2.0
Heptachlor epoxide	1.1 x 10 <sup>-4</sup>	1.1 x 10 <sup>-4</sup>

TABLE 6-6  
NPDES Effluent Limitations for Treated Groundwater

Constituent	Instantaneous Maximum (µg/L)	30-Day Median (µg/L)
PCBs (Arochlors)	$4.5 \times 10^{-5}$	$4.5 \times 10^{-5}$
Total Polynuclear Aromatics (PAHs)	0.031	0.031
TPH - Diesel	100.0 <sup>c</sup>	50.0 <sup>d</sup>
<b>Inorganics<sup>g,h</sup></b>		
Arsenic <sup>i</sup>	10.0	10.0
Cadmium	1.1	1.1
Chromium V <sup>j</sup>	11.0	11.0
Total Chromium	11.0	11.0
Copper	12.0	12.0
Lead	3.2	3.2
Mercury <sup>k</sup>	0.012	0.012
Nickel	160.0	160.0
Selenium	5.0	5.0
Silver	4.1	4.1
Zinc	110.0	110.0

<sup>a</sup> 30-day Median Limits for Volatile Organics are based on Best Available Technology.

<sup>b</sup> California Primary MCL

<sup>c</sup> Taste & odor threshold in water - USEPA

<sup>d</sup> Practical Quantitation Limit

<sup>e</sup> Both instantaneous maximum and monthly median limitations are based on USEPA Freshwater Ambient Water Quality Criteria.

<sup>f</sup> For certain semi-volatile parameters, the PQL exceeds the effluent limitation. In these cases, the discharger may use the PQL, as identified in the 1996 RD/RA Analytical Quality Assurance Project Plan (QAPP) to comply with its effluent limits. As laboratory technology improves, and as QAPPs are updated, it may be necessary to comply with more stringent PQLs in the future.

<sup>g</sup> With the exception of arsenic, both instantaneous maximum and monthly median limitations are based on USEPA Freshwater National Ambient Water Quality Criteria for Protection of Aquatic Life, expressed as total recoverable metal.

<sup>h</sup> Limits for Cadmium, Copper, Lead, Nickel, Silver, and Zinc are based on an annual hardness of 100 mg/L of CaCO<sub>3</sub>.

<sup>i</sup> Arsenic limits are based on Best Available Technology.

<sup>j</sup> Compliance with the Chromium VI limitation may be met as Total Chromium.

<sup>k</sup> Compliance is achieved by meeting the Reporting Limit using EPA Method 7470/7471. The effluent shall not contain more than 1 gram/day of mercury.

TABLE 6-7  
Discharge Limitations

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1. The discharge of waste shall not cause the following conditions to exist in the waters of the State at any place:
    - a) floating, suspended, or deposited macroscopic particulate matter or foam;
    - b) bottom deposits or aquatic growths;
    - c) alteration of temperature, turbidity, or apparent color beyond present natural background levels;
    - d) visible, floating, suspended, or deposited oil or other products of petroleum origin;
    - e) toxic or deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.
  2. The discharge of waste shall not cause excursions of the following limits in waters of the State in any place within one foot of the water surface:
    - a) Dissolved oxygen;  
  
For all tidal waters, upstream of Carquinez Bridge, 7.0 mg/L minimum; downstream of Carquinez Bridge, 5.0 mg/L minimum.  
  
For nontidal waters, waters designated as cold water habitat, 7.0 mg/L minimum; waters designated as warm water habitat, 5.0 mg/L minimum.  
  
The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation.
    - b) pH: The pH shall not be depressed below 6.5 nor raised above 8.5, nor be caused to vary from normal ambient pH levels by more than 0.5 units.
  3. The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Federal Clean Water Act and regulations adopted thereunder.
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Note: This table establishes narrative and numeric discharge limitation standards for treated groundwater discharged to waters of the State. These discharge standards are derived from California Regional Water Quality Control Board, San Francisco Bay Region, Order No. 94-087

TABLE 6-8  
Effluent Treatment Levels for Beneficial Reuse  
Discharges to Land for Irrigation Purposes

Water reclaimed for beneficial use shall meet the following limits:

Constituent	Instantaneous Maximum Limit (µg/L)
<b><i>Volatile Organic Compounds</i></b>	
Vinyl Chloride	0.5
Benzene	0.5
Dichloroethane	0.5
All Others, Per Constituent	5.0
<b><i>Semi-Volatile Organic Compounds</i></b>	
Per Constituent	5.0

The following limitations shall apply:

1. Water reclamation activities shall be limited to irrigation.
2. No reclaimed water shall be allowed to escape from the authorized use area by airborne, nor by surface flow except in minor amounts associated with good irrigation practice, nor from conveyance facilities.
3. Reclamation involving irrigation shall not occur when the ground is saturated.
4. The use of reclaimed water shall not impair the quality of waters of the State, nor shall it create a nuisance as defined by Section 13050(m) of the California Water Code.
5. Adequate measures shall be taken to minimize public contact with reclaimed water and to prevent the breeding of flies, mosquitoes, and other vectors of public health significance during the process of reuse.
6. Appropriate public warnings must be posted to advise the public that the water is not suitable for drinking. Signs must be posted in the area, and all reclaimed water valves and outlets labeled, as appropriate.
7. There shall be no cross-connection between the potable water supply and piping containing treated groundwater intended for reuse.

Note: This table establishes narrative and numeric discharge limitation standards for treated groundwater discharged to land. These discharge standards are derived from California Regional Water Quality Control Board, San Francisco Bay Region, Order No. 94-087

## 7.0 Works Cited

Association of Bay Area Governments. 1990. Provisional Series 3 projections, population, housing, employment and land uses. San Francisco Bay region. Hotel Claremont, Berkeley, California.

BioSystems Analysis, Inc. (Biosystems). 1993a. *Assessment of Special Status Plant and Animal Species at Travis Air Force Base, Solano County, California. Phase II Surveys (Draft)*. August.

Biosystems. 1993b. *Assessment of Habitat for Special Status Species at Travis Air Force Base, California*. October.

Biosystems. 1994. *Vernal Pool Resources at Travis Air Force Base, Solano County*. Final Report. June.

California Department of Water Resources, Central District. 1994. Historical Ground Water Levels in Solano County. March.

California Regional Water Quality Control Board (RWQCB). 1995. *A Compilation of Water Quality Goals*. Prepared by Jon B. Marshack. July.

CH2M HILL. 1995. *West/Annexes/Basewide Operable Unit Data Gaps Summary*. Travis Air Force Base, California. October 31.

CH2M HILL. 1996. *Final Comprehensive Basewide Ecological Risk Assessment - Tier 2 Screening Assessment*, Travis Air Force Base, California. May 31.

CH2M HILL. 1997. *West/Annexes/Basewide Operable Unit Remedial Investigation Report*. (Volumes 1-4), 60<sup>th</sup> Air Mobility Wing, Travis Air Force Base, California. May.

CH2M HILL. 1998. *West/Annexes/Basewide Operable Unit Feasibility Study*, 60<sup>th</sup> Air Mobility Wing, Travis Air Force Base, California. April.

Freeze, R. Allen and John A. Cherry. 1979. *Groundwater*. Prentice-Hall, Inc., Englewood Cliffs, N.J.

Jacobs Engineering Group (JEG). 1994a. *Final Risk Assessment Protocol*. Travis Air Force Base, California. November.

Jacobs Engineering Group (JEG). 1994b. *West/Annexes/Basewide Operable Unit, Draft Preliminary Assessment*, Travis Air Force Base, California. March.

Mayer, K. E. and W. F. Laudenslayer, Jr. 1988. *A Guide to Wildlife Habitats of California*. California Department of Forestry and Fire Protection. Sacramento, California.

Olmsted, F.H. and G.H. Davis. 1961. Geologic Features and Ground-Water Storage Capacity of the Sacramento Valley, California. Geological Survey Water-Supply Paper 1497.

Page, R.W. 1986. *Geology of the Fresh Ground-Water Basin of the Central Valley, California, with Texture Maps and Sections*. U.S. Geological Survey Professional Paper 1401-C.

Radian. 1994. *Remedial Investigation/Feasibility Study Work Plan, North Operable Unit*, Travis Air Force Base, California. April.



Radian. 1996a. *Final Groundwater Sampling and Analysis Program*. Travis Air Force Base, California. July.

Radian. 1996b. *Final Remedial Investigation, West Industrial Operable Unit*. Travis AFB, California. February.

Radian. 1997. *Groundwater Interim Record of Decision for the NEWIOU*, Travis Air Force Base, California.

Sims, J.D., K.F. Fox, J.A. Bartow, and E.J. Helley. 1973. *Preliminary Geologic Map of Solano County and Parts of Napa, Contra Costa, Marin, and Yolo Counties, California*. U.S. Geologic Survey.

State of California, Department of Finance. 1994. *Population Estimates for California Cities and Counties*. Official State Estimates. Demographic Research Unit. Sacramento, California.

Thomasson, H.G., F.H. Olmsted and E.F. LeRoux. 1960. *Geology, Water Resources and Usable Ground-Water Storage Capacity of Part of Solano County, California*, Geological Survey Water-Supply Paper 1464.

Travis Air Force Base. 1998. *Proposed Plan for Groundwater Cleanup*. April.

U.S. Department of Commerce, U.S. Bureau of the Census. 1990. *Census data*.

U.S. Environmental Protection Agency (EPA). 1995. *Region IX Preliminary Remediation Goals (PRGs) Second Half 1995*. September 1.

Wagner, D.L. and E.J. Bortugno. 1982. *Geologic Map of the Santa Clara Quadrangle*. California Divisions of Mines and Geology.

Weston. 1993. *Draft Final Work Plan Addendum, East Industrial Operable Unit*, Travis AFB, California. September.

Weston. 1995a. *Final Basewide Ecological Habitat Assessment*, Travis AFB, California. June.

Weston. 1995b. *Final Remedial Investigation Report, East Industrial Operable Unit*, Travis AFB, California. October.

## PART III

# Responsiveness Summary

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The Air Force has promoted public input through the WABOU Groundwater Proposed Plan and 8 April through 8 May 1998 public comment period. This Proposed Plan was issued to the public just prior to the start of the public comment period. To encourage public comment, the Air Force listed the phone numbers and E-mail addresses of Air Force and DTSC representatives in the Proposed Plan, distributed copies of the Proposed Plan to local libraries, and held a public meeting on 23 April 1998 at the Fairfield/Suisun Community Center.

Several community members attended the public meeting, and oral comments were received from one person: John Rundlett. No other comments were submitted to either the Air Force or DTSC during the public comment period. A written transcript of the public meeting contains the oral comments and is available for public review at the Travis AFB Information Repository, located at the Vacaville Public Library. The oral comments concerning the cleanup of contaminated groundwater in the WABOU at Travis AFB are presented below and have been paraphrased for greater clarity. The selection of groundwater remedial actions in the WABOU is based on the documents in the Administrative Record and comments received from the public.

**Public Comment 1: There was concern that there may be alternative technologies available that could be used to clean up the contaminated groundwater in the WABOU in a more efficient or cost-effective manner.**

**Air Force Response:** The Air Force is looking closely at the use of naturally occurring processes to clean up contaminated groundwater. Known as Monitored Natural Attenuation, this innovative technology relies on subsurface microorganisms that use the groundwater contaminants as a source of energy. They break the contaminant molecules down into harmless by-products.

Unfortunately, this technology has not been proven to be effective against all types of groundwater contaminants. In the WABOU the only groundwater contaminants against which Monitored Natural Attenuation may be effective are found at Building 755. This technology is not applicable to the groundwater contaminants at the other three sites, so the more established pump-and-treat technology is proposed for those sites. Also, the microorganisms have not been shown to be active and capable of preventing the future expansion of the solvent plume at Building 755. As a result, the proposed interim groundwater remedial alternative for this site includes the collection of groundwater data to demonstrate the effectiveness of this technology under the site-specific conditions at Building 755. These data will be used to select the final groundwater remedies for all of the contaminated groundwater sites on Travis AFB.

Other innovative technologies were ruled out in the WABOU Feasibility Study, because they were evaluated to be not effective under the site-specific conditions at Travis AFB.

**Public Comment 2: There was concern that the extraction and treatment of the contaminated groundwater would result in the accumulation of large drums of concentrated contaminants that the Air Force would have to transport to an offbase dumpsite.**

Air Force Response: The contaminants that are accumulated through the extraction and treatment of contaminated groundwater will not be stored in drums at Travis AFB. For example, one treatment method is to run the contaminated groundwater through an activated carbon canister to remove the contaminants from the groundwater. The contaminant molecules attach themselves to the carbon material, allowing the cleaned water to flow out of the canister. Afterward, the canister is sent to an appropriate offsite facility where the contaminant molecules are stripped from the carbon and destroyed, and the carbon canister is prepared for reuse. So, with this method, the contaminants are not in a concentrated form and are not stored onbase for a long period of time. Another treatment option is to use an oxidation system to physically destroy the contaminants in the groundwater. All of the treatment options that were evaluated for use in the WABOU will result in the safe removal of the contaminants. Drums will not be used to collect concentrated contaminants.

**Public Comment 3: Will the contaminated groundwater have a negative impact on the repair of the runways at Travis AFB?**

Air Force Response: The groundwater sites in the WABOU are located far from the runways, so the presence of this groundwater contamination and its treatment will not impact the repair of the runways.

## **Appendix A**

### **Site Summary Figures**

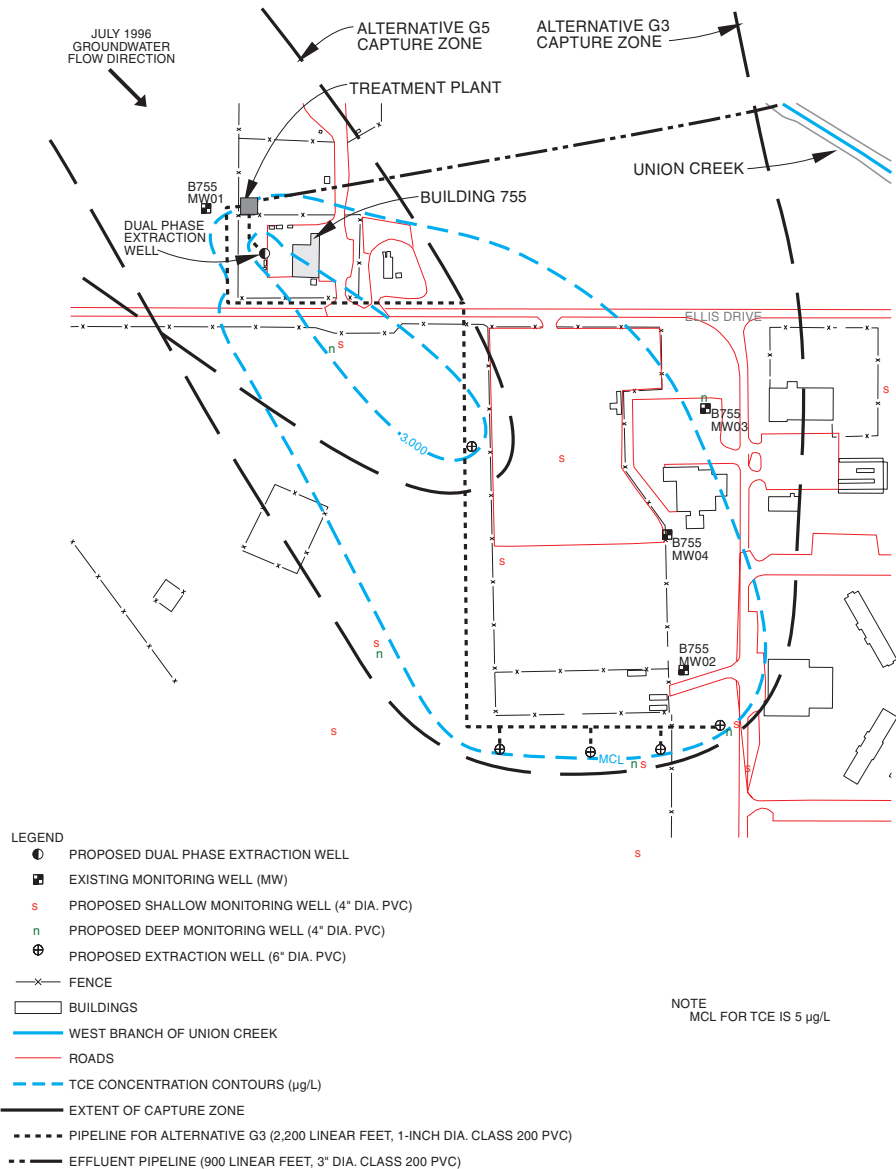
## APPENDIX A

# Site Summary Figures

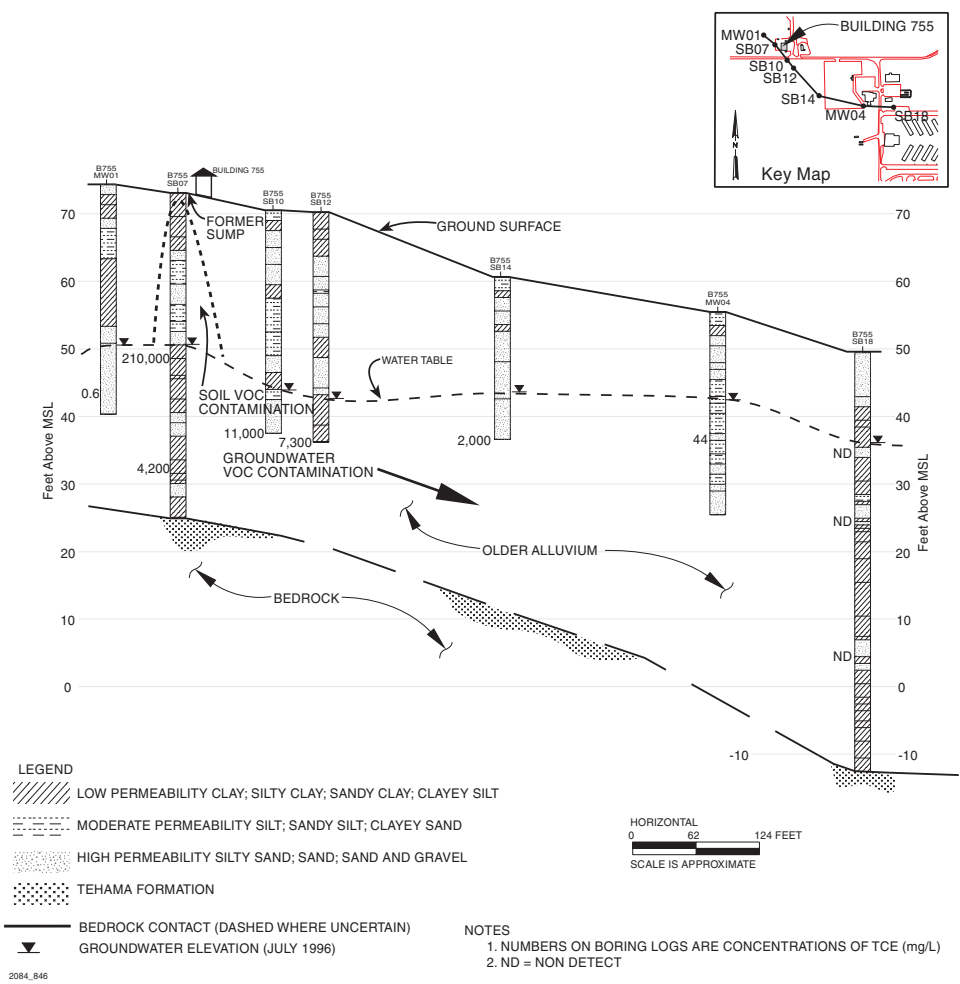
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The figures in this appendix summarize the site-specific information for each West/Annexes/Basewide Operable Unit (WABOU) groundwater site. Each summary contains background and contaminant information from the WABOU Remedial Investigation report, a brief description and estimated costs of the remedial alternatives that were developed in the WABOU Feasibility Study (FS), and a description of the selected interim groundwater remedial action. It also includes a conceptual model of a cross section of the site and a conceptual design of the selected alternative.

These figures were created to give the reader a snapshot of the characteristics of each site and associated contamination that led to the selection of the remedial actions. For additional information, Section 3.0 of this interim Record of Decision provides a more detailed description of the nature and extent of contamination and the calculated potential risks at each site. Section 4.0 provides a more detailed description of the FS process and the detailed evaluation of the remedial alternatives based on seven of the nine Comprehensive Environmental Response Compensation and Liability Act (CERCLA) criteria. Tables 4-1 through 4-6 summarize the qualitative evaluation of the groundwater remedial alternatives against each criterion. Table 4-7 provides the estimated cost of each remedial alternative at each site. Section 5.0 provides a more detailed description of the selected remedial actions and the rationale for their selection.

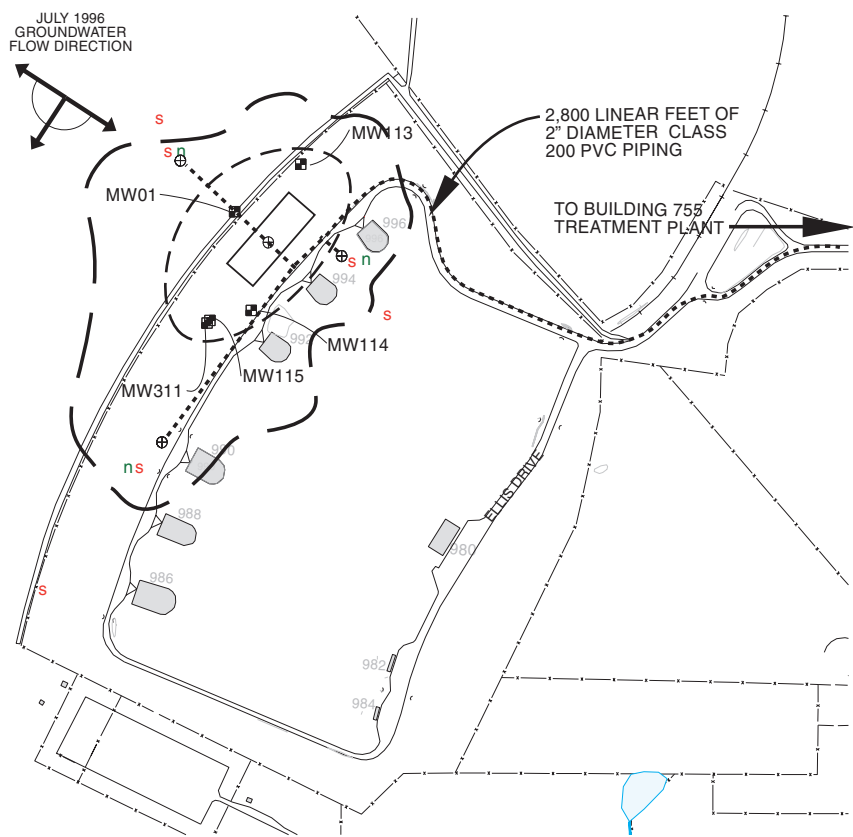


CONCEPTUAL DESIGN OF SELECTED ALTERNATIVES



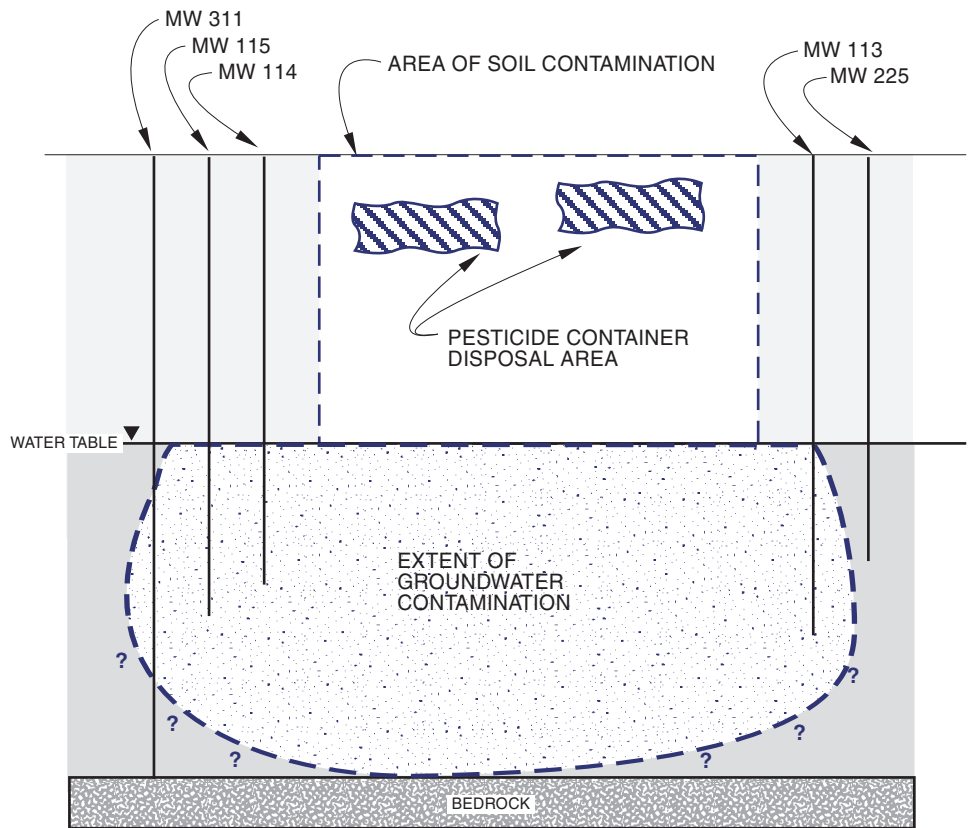
CONCEPTUAL MODEL/CROSS SECTION

**FIGURE A-1**  
**BUILDING 755**  
**SITE SUMMARY**  
WEST/ANNEXES/BASEWIDE OPERABLE UNIT (WABOU)  
WABOU GOUNDWATER IROD  
TRAVIS AIR FORCE BASE, CALIFORNIA



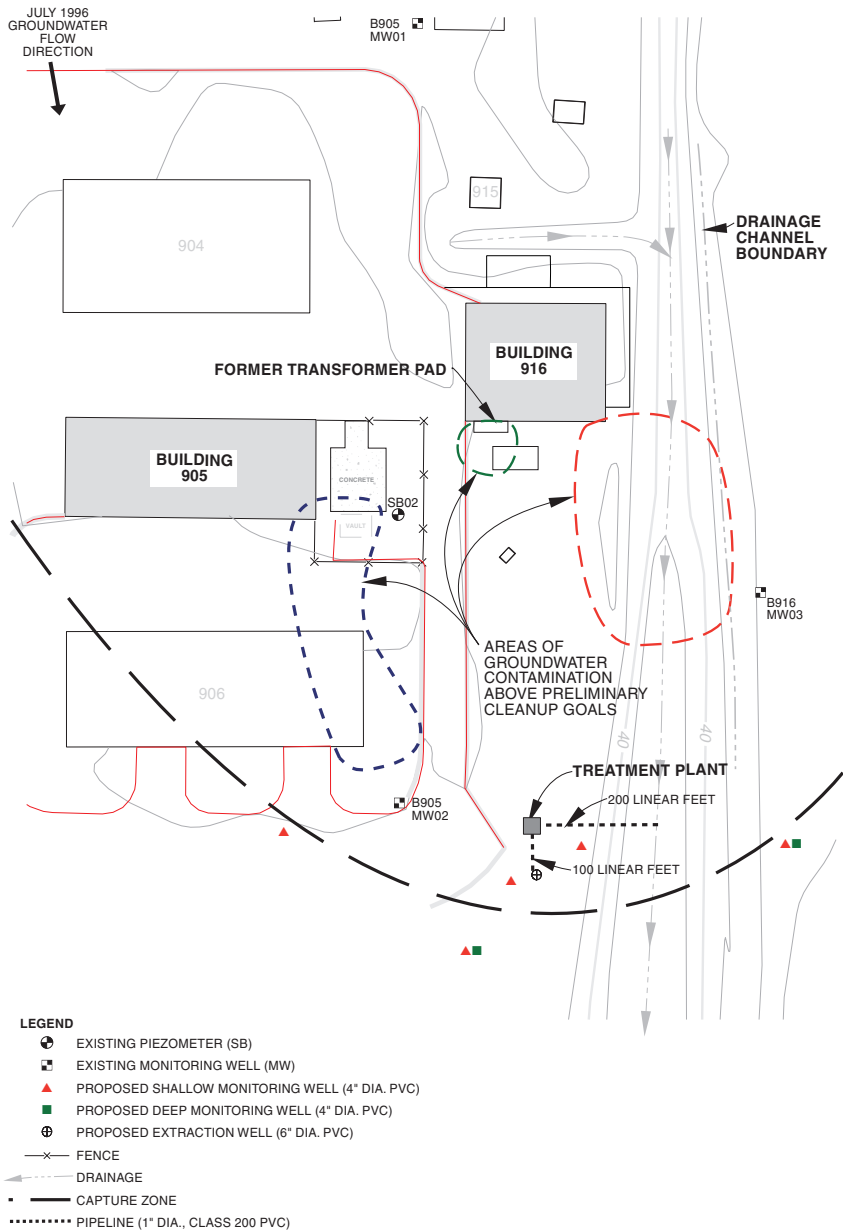
- LEGEND
- EXISTING MONITORING WELL (MW)
  - ⊕ PROPOSED EXTRACTION WELL (6" DIAMETER PVC)
  - S PROPOSED SHALLOW MONITORING WELL (4" DIAMETER PVC)
  - n PROPOSED DEEP MONITORING WELL (4" DIAMETER PVC)
  - FENCE
  - CAPTURE ZONE
  - ..... PIPELINE (2" DIAMETER, CLASS 200 PVC)
  - - - AREA OF GROUNDWATER CONTAMINATION

CONCEPTUAL DESIGN OF SELECTED ALTERNATIVE

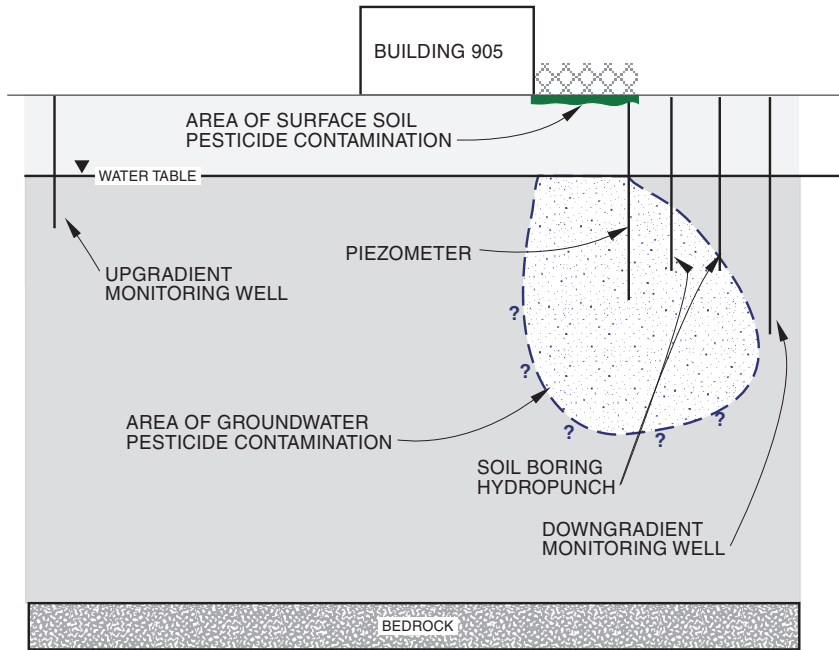
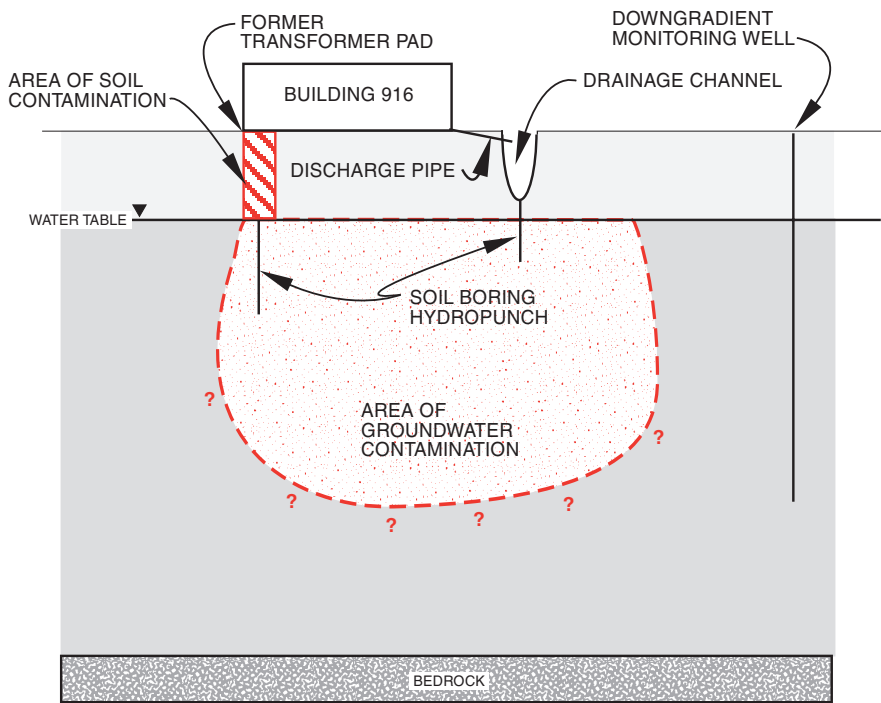


CONCEPTUAL MODEL

**FIGURE A-2**  
**LANDFILL 3**  
**SITE SUMMARY**  
 WEST/ANNEXES/BASEWIDE OPERABLE UNIT (WABOU)  
 WABOU GROUNDWATER IROD  
 TRAVIS AIR FORCE BASE, CALIFORNIA



CONCEPTUAL DESIGN OF SELECTED ALTERNATIVE



CONCEPTUAL MODEL

**FIGURE A-3**  
**BUILDINGS 905/916**  
**SITE SUMMARY**  
 WEST/ANNEXES/BASEWIDE OPERABLE UNIT (WABOU)  
 WABOU GROUNDWATER IROD  
 TRAVIS AIR FORCE BASE, CALIFORNIA