

Installation Restoration Program

North/East/West Industrial Operable Units
Travis Air Force Base

Proposed Plan for Soil, Sediment, and Surface Water

FINAL



JULY 1998

Purpose

The Air Force seeks your comments on the proposed **remedial actions*** to clean up soil, sediment, and surface water contamination at Travis Air Force Base (AFB), California (Figure 1). This Proposed Plan (Plan) describes the soil contamination at these 18 locations and the possible options that are available to clean up this contamination. The Plan also describes the Air Force's preferred options and the rationale for them.

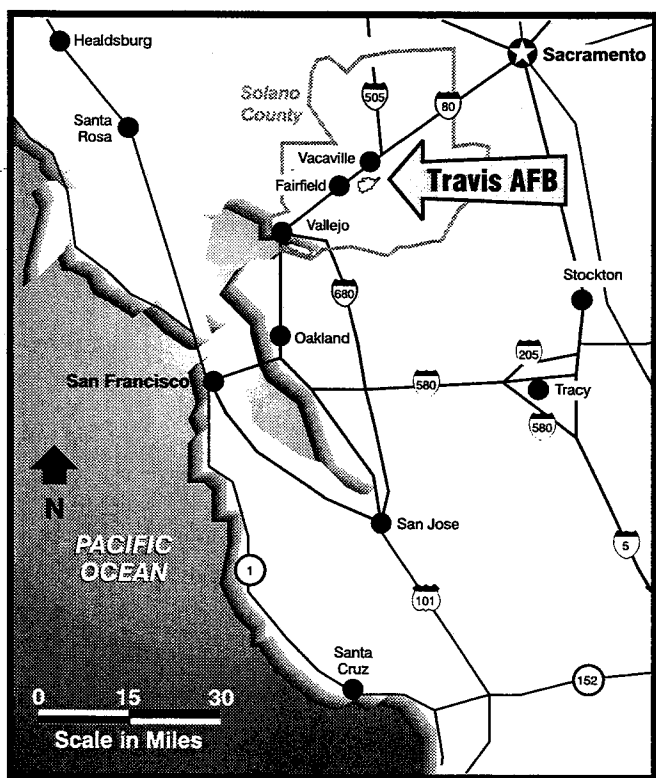


Figure 1. General Location Map, Travis AFB

This Plan is available for comment from July 8, 1998 to August 8, 1998. You are encouraged to provide your comments to either the Air Force or regulatory agency representatives during this 30-day public comment period using any of the methods described on page 19 of this Plan. You are also invited to discuss these cleanup options at a public meeting on July 23, 1998 at the Fairfield Senior Center in Fairfield. A map showing the location of the meeting is provided on the back cover.

* Words highlighted in **boldface** are defined in the Glossary on Page 19 of this Proposed Plan.

This Plan addresses soil, sediment, and surface water contamination in three of four areas known as **Operable Units (OUs)** of Travis AFB. These OUs are the North, East Industrial, and West Industrial OUs (NOU, EIOU, WIOU), together known as the NEWIOU (see Figure 2). Cleanup of soil and **groundwater** in the remaining OU, the West/Annexes/Basewide OU (WABOU), are addressed in two separate Proposed Plans. The Air Force previously identified areas of groundwater contamination in the NEWIOU and a separate Proposed Plan described its proposed **remediation**. That Proposed Plan has been available for review at the Travis AFB **Information Repository** since September 1996, and a public meeting to solicit comments was held on October 17, 1996. The address of the Information Repository is provided on the back cover.

The NEWIOU Soil, Sediment, and Surface Water Proposed Plan summarizes the technical information that applies to the 18 locations and the potential cleanup alternatives that could be used to clean up the contamination. This technical information is presented in much greater detail in the NOU, EIOU, and WIOU **Remedial Investigation (RI)** reports and the NEWIOU **Feasibility Study (FS)** report.

Once the cleanup actions are selected, they will be documented in a formal legal document, known as a **Record of Decision (ROD)**. The ROD will be approved and signed by the U.S. Air Force, the U.S. Environmental Protection Agency (U.S. EPA), the California Department of Toxic Substances Control (DTSC), and the San Francisco Bay Regional Water Quality Control Board (RWQCB). These three regulatory agencies have provided technical oversight and program management to Travis AFB to assist in the decision-making process.

The Air Force and the regulatory agencies all realize that community input and acceptance is critical to the success of any cleanup action. Your participation in the review and discussion of *all* proposed cleanup alternatives is needed to help with the selection process.

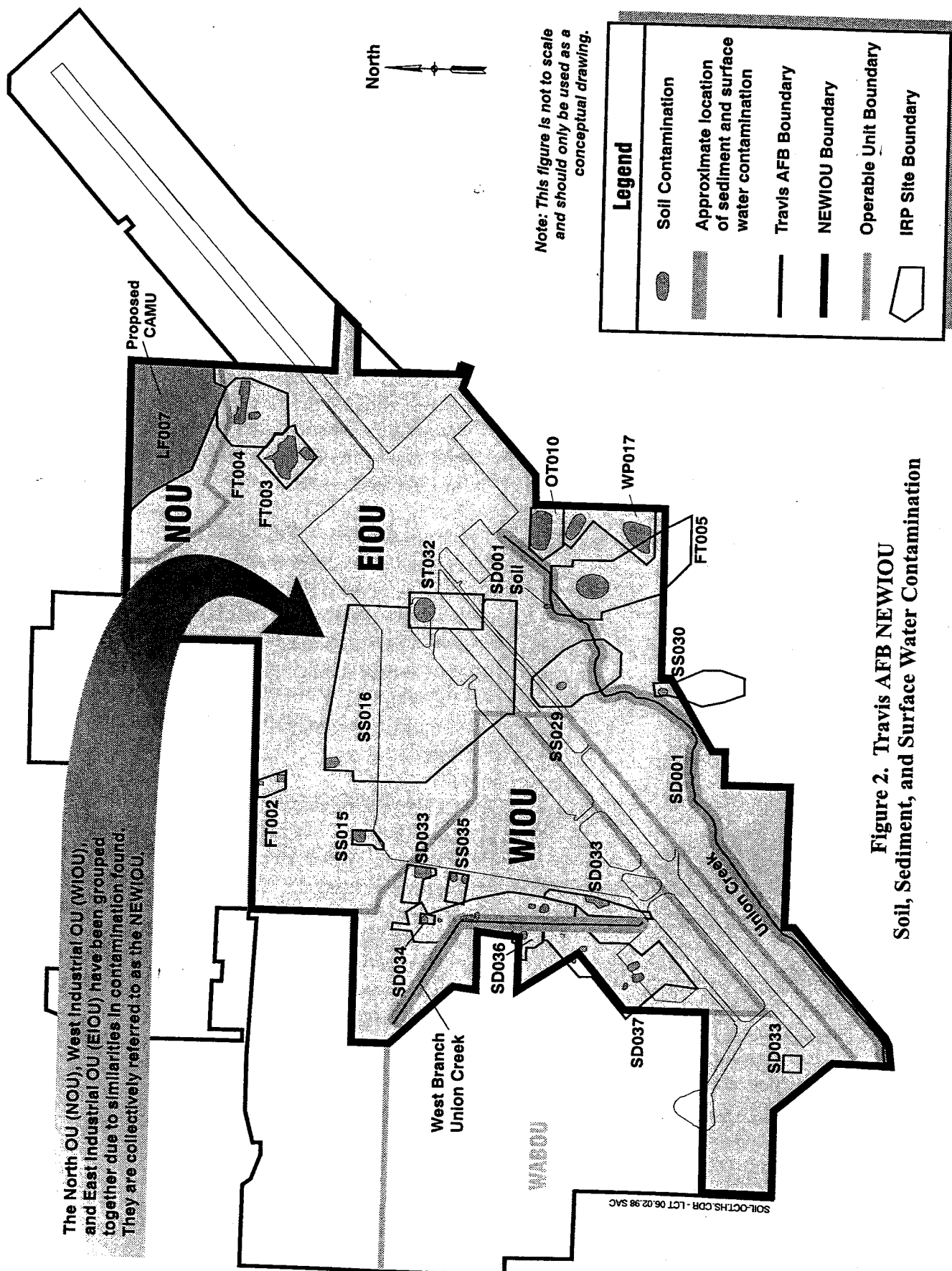


Figure 2. Travis AFB NEWIOU
Soil, Sediment, and Surface Water Contamination

Base Description

Travis AFB occupies approximately 5,025 acres in Solano County, California, near the City of Fairfield, midway between San Francisco and Sacramento. It is located in primarily agricultural or range land, although recent years have seen residential development to the southwest and commercial development to the north and west.

Travis AFB has provided strategic airlift support to military forces worldwide since it was established in 1943. It is home to the largest military cargo and operation organization in the Air Force. As other Air Force bases have closed across the country, some missions from those bases have relocated to Travis AFB, including two squadrons of KC-10 aerial refueling aircraft (shown on the front cover). To support these missions, various hazardous materials, such as oils, fuels, and solvents, are used both to maintain the aircraft and in associated industrial processes.

Cleanup Program

In 1983, the Travis AFB established an **Installation Restoration Program (IRP)** to investigate soil and groundwater contamination resulting from past base operations. Hazardous waste was released over the years as a result of leaking pipelines, spills, fire training activities, or disposal of wastes to landfills. The hazardous materials handling and disposal practices that resulted in this contamination were conducted in accordance with regulations at the time, but have since been stopped. Travis AFB now follows environmentally safe guidelines for the management and disposal of all hazardous materials and waste. In 1989, after evaluating initial IRP data, the U.S. EPA placed Travis AFB on the **National Priorities List (NPL)**, also known as the Superfund list. The cleanup of NPL sites must follow the applicable procedures outlined in the federal Superfund Act and supporting regulations. The official title of the Superfund law is the **Comprehensive Environmental Response,**

Compensation, and Liability Act, or CERCLA. Figure 3 shows where this Plan is in the CERCLA process.

After being placed on the Superfund list, the Air Force entered into a legal agreement with the U.S. EPA and the State of California, called the **Federal Facilities Agreement (FFA)**. The FFA provides schedules and timelines for the investigation and cleanup of contamination at Travis AFB.

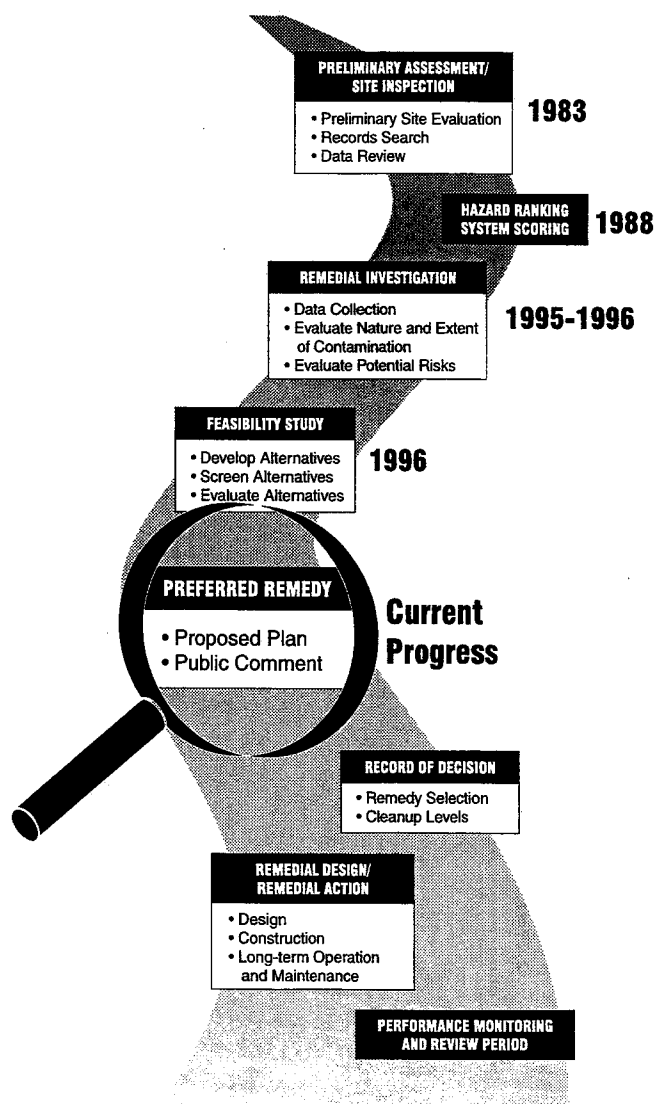


Figure 3. The NEWIOU Soil, Sediment, and Surface Water Proposed Plan in the CERCLA Process

Summary of Site Contamination

In the RIs for the NEWIOU, soil contamination was identified for possible remediation at 18 sites. Two of these sites also include sediment and surface water contamination that has been identified and targeted for possible remediation. Among these sites are areas that were used for fire training, aircraft maintenance, painting, aircraft washdowns, landfills, sewage treatment, jet fuel distribution, and sludge disposal. Table 1 provides information on the primary contaminants of concern for each IRP site, and the median and maximum concentrations found. It also shows the **Preliminary Remediation Goals (PRGs)** for each contaminant. PRGs are discussed in greater detail under the Preliminary Remediation Goals section.

For surface water sites, California **Maximum Contaminant Levels (MCLs)** were used for comparison purposes. The contaminants of concern found throughout the sites fall into eight different classes or groups of contaminants: **volatile organic compounds (VOCs)**; **semivolatile organic compounds (SVOCs)**; **fuels (petroleum hydrocarbons)**; **polychlorinated biphenyls (PCBs)**; **polycyclic aromatic hydrocarbons (PAHs)**; **dioxins**; **pesticides and metals (inorganic compounds)**. Table 2 provides a description of each contaminant class, examples of specific contaminants found at Travis AFB, and the possible origin of the contamination.

Summary of Site Risks

Currently, the types and concentrations of contaminants at the 18 sites in the NEWIOU may pose a potential risk to human health and the environment (that is, plants and animals). The amount of potential risk depends on the contaminant, its concentration, and where it is found. Cleanup activities are required to protect people, plants, animals, and the environment from future *potential* risks. These actions are necessary to permanently remove the possibility of potential exposure to harmful chemicals.

Certain areas of the base contain important habitats, such as Union Creek and the West Branch of Union Creek, which receive runoff water from Travis AFB. Southwest of Travis AFB, Union Creek flows into Hill Slough, which drains into Suisun Marsh, the largest contiguous marsh in the continental United States. Cleanup of contamination that poses a threat to ecological **receptors** will consider **special-status species** that have been identified at Travis AFB and that may be affected by the contamination. Cleanup actions will comply with the **Endangered Species Act**.

Soil Risks – There are no immediate **human health** or **ecological risks** associated with contaminated soil in the NEWIOU. **PCBs**, **metals**, **pesticides**, **VOCs**, and other **contaminants of concern (COCs)** present potential human health risks to future construction workers/residents through dust inhalation or direct contact with contaminated soil. However, all construction projects that require soil excavation are reviewed by Travis AFB Environmental Management to ensure that construction workers and on-base residents are protected from exposure to possible soil contaminants.

Sediment Risks – Potential ecological risks are associated with aquatic organisms ingesting and having direct contact with contaminated **sediment**. There are no potential human health risks because there are no complete **exposure pathways**.

Surface Water Risks – Potential ecological risks exist to animals or aquatic organisms that drink contaminated water, or for aquatic organisms that come into direct contact with contaminated water. The Final Comprehensive Basewide Ecological Risk Assessment – Tier 2 lists deer mice, ornate shrews, and raccoons as the species most likely to be affected by chemicals detected in **surface water**, **sediment**, or **living organisms**. These species are fairly common at Travis AFB and may be exposed to surface water by drinking. Aquatic invertebrates and fish may be exposed to surface water and sediment as well as contaminated food items. Evaluations for surface water (Union Creek)

Table 1
Primary Contaminants in the NEWIOU

Site Number	Medium	Primary Contaminants	Median Concentration (ppm)	Maximum Concentration (ppm)	Industrial Preliminary Remediation Goals (PRGs) (ppm)
SD001	Surface Water	Dieldrin	0.00000835	0.000139	0.0000042*
	Sediment	Dieldrin	0.04535	0.173	0.12
	Sediment	Benzo(a)pyrene	0.123	3.83	0.26
	Soil	Benzo(a)pyrene	1.086	11	0.26
FT002	Soil	Lead	14.4	853	1,000
		Chromium	18.7	66.6	64
FT003	Soil	Fluoranthene	0.441	71.7	27,251
		Lead	20	686	1,000
FT004	Soil	Dioxin	0.023	0.16	0.000024
		Antimony	5.15	167	681
FT005	Soil	Aroclor-1254	1.09	1.09	19
		Selenium	1.355	206	8,517
LF007	Soil	Benzo(a)pyrene	3.89	7.0	0.26
		Aroclor-1260	1.29	336	0.34
OT010	Soil	Silver	7.09	230	8,517
		DDE	0.00239	.0918	6
SS015	Soil	Fluoranthene	0.6	1.87	27,251
		Lead	33.4	28,200	1,000
SS016	Soil	Fluoranthene	0.178	7.71	27,251
		Aroclor-1260	0.0574	0.452	0.34
WP017	Soil	Aroclor-1260	0.182	1.08	0.34
		Aluminum	18,700	32,700	100,000
SS029	Soil	Benzo(a)pyrene	0.0346	0.0346	0.26
SS030	Soil	Benzo(a)pyrene	0.0406	0.0498	0.26
		Antimony	11.4	37.6	681
ST032	Soil**	Arsenic	10.3	17.2	2.38
SD033	Surface Water	Barium	0.269	5.41	1.0
	Sediment	Acetone	1.6	2.5	8,754
	Soil	Mercury	0.0308	1.28	68
SD034	Soil	Fuels	815	15,900	10-100***
SS035	Soil	Aroclor-1260	0.133	0.204	0.34
SD036	Soil	Fuels	39.8	292	10-100
SD037	Soil	Benzo(a)pyrene	0.0336	0.0395	0.26
		Fuels	475	909	10-100

Fuels = Specific fuel types could not be determined; however, these fuels are most likely jet fuel or diesel.

ppm = parts per million

* Since no MCLs exist for dieldrin, tap water PRGs were used for comparison purposes.

** Fuel contamination was also detected at ST032 at a maximum concentration of 3,900 ppm.

*** Derived from Leaking Underground Fuel Tank (LUFT) Manual, 1989.

Table 2
Contaminant Descriptions

Group	Description	Example	Origin
Volatile organic compounds (VOCs)	VOCs are chemicals that evaporate (or volatilize) easily at normal temperatures. VOCs include such diverse compounds as solvents, and constituents of gasoline, such as benzene.	Benzene (a component of gasoline), acetone, trichloroethene (TCE)	Fuel spills and former cleaning practices involving solvents.
Semivolatile organic compounds (SVOCs)	SVOCs are a collection of different types of organic compounds (that is, compounds that contain carbon), which range from chemicals that will evaporate under the right conditions to those that can be present in a solid form. Some of the fuel compounds are considered semi-volatile.	Fuels; polycyclic aromatic hydrocarbons (PAHs); polychlorinated biphenyls (PCBs); and pesticides	Fuel spills, fire training exercises.
Fuels	Different types of fuels are used at Travis AFB, such as diesel fuels for trucks, and jet fuel for aircraft. Certain components of fuels may be either SVOCs or VOCs.	Fuels, like diesel, gasoline, jet fuel.	Fuels spills, leaking underground storage tanks, fuel lines.
Polychlorinated biphenyls (PCBs)	PCBs, a type of SVOC, are oily liquids that were used as coolants, insulating materials, and lubricants in electrical equipment such as transformers.	Aroclor-1254 Aroclor-1260	Leaking transformers.
Polycyclic aromatic hydrocarbons (PAHs)	PAHs, a type of SVOC, are by-products of the incomplete burning of fuel.	Benzo(a)pyrene, benzo(a)anthracene; fluoranthene	Fire training exercises, ongoing burning of petroleum products (such as diesel engines).
Dioxins	Dioxins, a type of SVOC, are by-products of the combustion of hydrocarbons that contain chlorine (such as solvents).	2,3,7,8-tetrachlorodibenzodioxin (TCDD)	Fire training exercises where fuels and solvents were burned together.
Pesticides	Pesticides are chemicals used to control insects, rodents, weeds, etc. Two classes of organic pesticides include chlorinated pesticides and organophosphorus pesticides.	Chlordane; dieldrin; 2,2-bis (p-chlorophenyl)-1,1-dichloroethylene (DDE); 1,1-Dichloro-2,2-bis(p-chlorophenyl) ethane (DDD); methoxone	Travis AFB, as well as surrounding agricultural lands.
Metals	Metals and metalloids are basic elements, found in paints, sludges, and pesticides.	Aluminum, antimony, arsenic, barium, chromium, lead, mercury, selenium, silver, and zinc.	Paint stripping and sludge disposal. Metals also occur naturally in the environment.

indicated that adverse effects, such as skin lesions, fin rot, and spinal curvature, were observed in fish collected near Outfalls II, III, and IV, and at the southwest base boundary. The EIOU Ecological Risk Assessment determined that there were adverse effects on aquatic life in Union Creek that were potentially due to chemicals found in the surface water or sediment. However, the chemicals causing the impacts were not identified. The preliminary **chemicals of potential ecological concern (COPECs)** in the main branch of Union Creek include metals (e.g., lead), pesticides (e.g., dieldrin), PAHs (e.g., benzo(a)pyrene), PCBs (Aroclor-1260), SVOCs, and VOCs. There is a potential risk to mammals through food chain transfer of chemicals through eating fish.

Preliminary Remediation Goals

Preliminary Remediation Goals (PRGs) were used in the FS to estimate the volume of soil that needs to be cleaned, to estimate project costs, and to determine whether a cleanup technology can adequately clean up contaminants and reduce the potential risk at a site to a low, protective level. PRGs are *not* the same as final cleanup levels. Final cleanup levels are used to establish when a site is considered clean and are approved by the regulatory agencies. Industrial PRGs for some contaminants have been listed in Table 1 to give the reader a better sense of the contamination found at a particular location. Different PRGs exist for residential and industrial land uses. Future land use at Travis AFB IRP sites will be restricted to industrial, as appropriate, under the Base Comprehensive Plan; therefore, industrial use PRGs were used in the FS. Residential use PRGs are more stringent than industrial use PRGs and therefore may increase the cost of soil cleanup. In the event that residential uses are considered in the future, residential PRGs would be used to compare contaminant concentrations. This may necessitate further cleanup of the site. Site-specific final cleanup levels (which may be different from PRGs) will be documented in the NEWIOU Soil, Sediment, and Surface Water ROD.

The Cleanup Alternatives

The NEWIOU RI identified the nature and extent of contamination at the 18 soil, sediment, and surface water sites. The NEWIOU FS was completed to identify the appropriate cleanup methods for each site identified in the RIs. The FS looked at all available cleanup technologies, screened out the technologies that would not work, and used the remaining technologies to develop cleanup strategies, known as remedial alternatives. The FS evaluated the alternatives using the first seven of the nine criteria established by the U.S. EPA and described in Figure 4. The last two criteria are state and community acceptance. State acceptance is received when the two California regulatory agencies, DTSC and RWQCB, accept the proposed actions at the 18 NEWIOU sites. Community acceptance is measured through the review of, and comment on, this Proposed Plan at the 23 July 1998 public meeting and during the 30-day public comment period. Evaluation of these last two criteria will be included in the NEWIOU Soil, Sediment, and Surface Water ROD. The responses to public comments will be published in a section of the ROD called the **Responsiveness Summary**.

Surface Water Cleanup Alternatives

The cleanup alternatives and costs developed in the FS for the two sites with surface water contamination are described in Table 3. Costs for Alternatives 12 and 13 were estimated based on a 30-year period and include initial capital costs plus 29 years of operation and maintenance of the system. Costs for Alternative 11 include sampling and analysis over the same period. Costs for selected alternatives will be updated during the Remedial Design phase.

Soil and Sediment Cleanup Alternatives

The cleanup alternatives developed in the FS for the sites with soil and sediment contamination are described in Table 4. The costs of applying each alternative to individual IRP sites are provided in Table 5.

All remedial action alternatives are weighed against the following criteria.

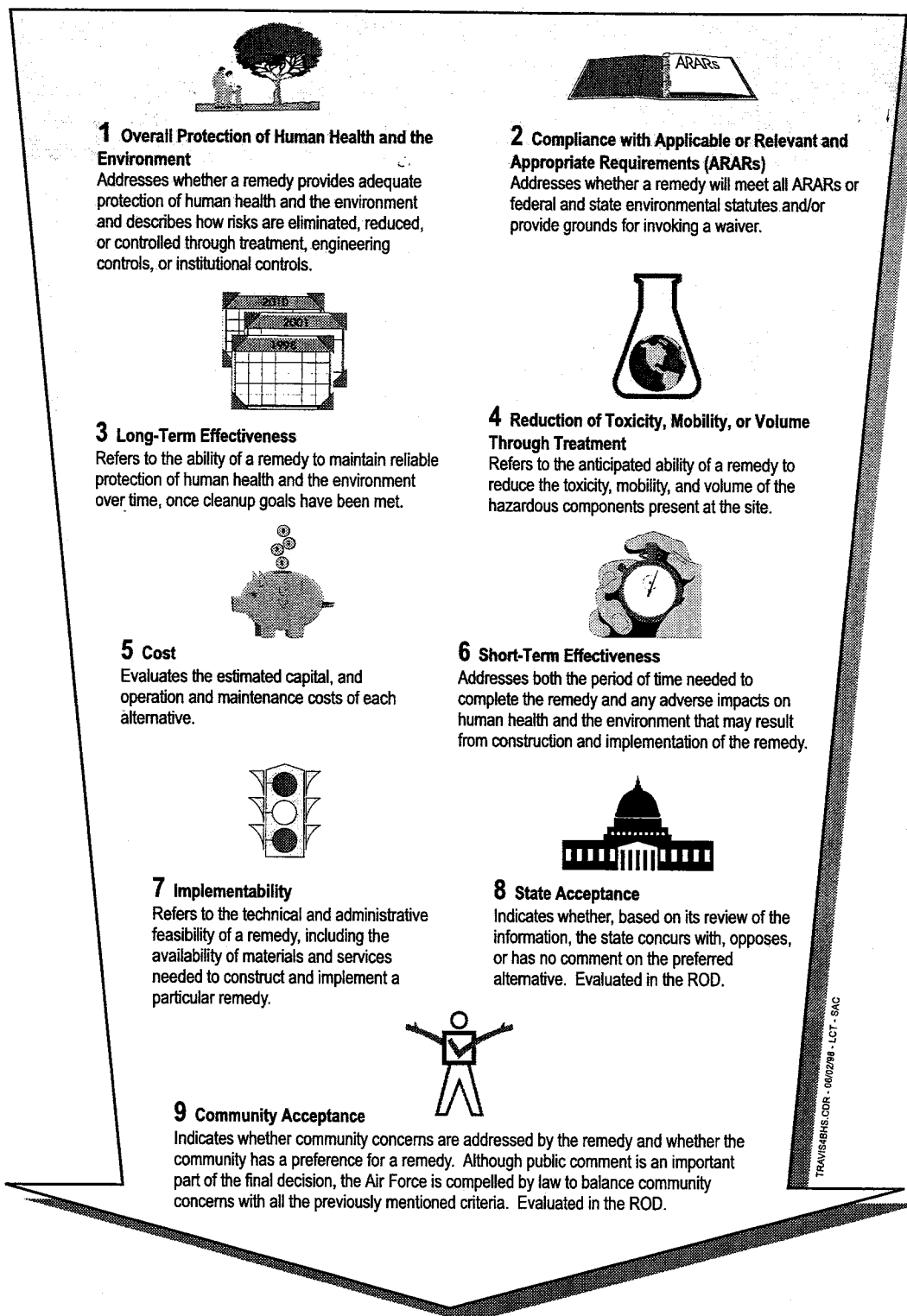


Figure 4. The Nine CERCLA Evaluation Criteria

Table 3
Descriptions of Surface Water Cleanup Alternatives for the NEWIOU

Cleanup Alternative*	Description	Total Estimated Costs
10. No Action	Federal regulations require the use of this alternative as a starting point for comparing the other alternatives. Under this alternative no treatment takes place.	\$0
11. Institutional Actions	Surface water would be monitored to determine levels of contamination over time. No active treatment of the water is involved. The Base Master Plan will be updated after the ROD is signed to note that the surface water is being monitored and is not for use.	\$2,600,600
12. Collection Sump, Ion Exchange, Activated Carbon, Discharge to Union Creek	Water is pumped into a collection sump, where it is held and treated. Two forms of treatment are used. First, ion exchange uses special resins to remove metals from the water. Second, the water, still contaminated with organic contaminants, is then passed through charcoal filters. The contaminants stick to the charcoal, which can later be regenerated to remove the contaminants. Treated water is discharged (in accordance with effluent discharge limits) to Union Creek, which empties into the Suisun Marsh via the Hill Slough.	\$14,000,000
13. Collection Sump, Activated Carbon, Discharge to Union Creek	Same as Alternative 12, without ion exchange. This alternative would be used at sites without metal contamination.	\$9,100,000
14. Slip-lining and Collaring Storm Sewer	During slip-lining, a plastic pipe is installed within an existing deteriorated storm sewer pipe, thereby limiting infiltration of contaminated groundwater into the storm sewer system. Collars are external barriers installed along the pipe to prevent contaminated water from moving through the gravel surrounding the pipe.	\$390,000
15. Source Control	Source Control relies on treating contamination at the source, before it is discharged into a creek. Pump and treat interim actions to address contaminated groundwater will prevent possible contaminant movement to surface water. Regular cleanout of storm sewers and sumps will also prevent contaminants from reaching the creek.	\$0 <i>(Source control costs are being incurred as part of the Groundwater Interim Record of Decision (IROD))</i>

* The alternatives for surface water are numbered 10 through 15 to be consistent with the numbers used in the FS.

Corrective Action Management Unit (CAMU)

The preferred alternative for contaminated soil and sediment at most NEWIOU sites is removal of contaminated soil by excavation and disposal at a landfill. There are two options for landfill disposal, off-site disposal in an appropriate facility

and consolidation on base in a **Corrective Action Management Unit (CAMU)**. A CAMU is a designated area that is designed to carry out a corrective action, such as the management of contaminated soil. In general, the state and federal

Table 4
Descriptions of Soil and Sediment Cleanup Alternatives for the NEWIOU

Cleanup Alternative*	Description
16. No Action	Federal regulations require the use of this alternative as a starting point for comparing the other alternatives. Under this alternative no treatment takes place.
17. Institutional Actions/ Monitored Natural Attenuation	Access to soil and sediment is restricted and contaminant concentrations are allowed to decrease naturally through the actions of microorganisms. Includes monitoring the site to ensure natural attenuation is taking place. The Base Master Plan will be updated after the ROD is signed to restrict access.
18. Excavation, Removal to Landfill	Contaminated soils are excavated and removed to a designated CAMU at Travis AFB or to an off-base landfill.
19. Cap	The site is covered with a material such as asphalt, concrete, synthetic membrane, or soil and/or clay. For landfill areas, the area is also graded to control runoff, thereby minimizing the potential for rainwater to move through contaminated soil to protect the groundwater below from contamination.
20. Excavation, Ex-Situ High Temperature Thermal Treatment, Disposal at Landfill	Contaminated soil is excavated and treated at high temperatures (for example, in a rotary kiln incinerator). As a result, organic contaminants are destroyed through conversion to carbon dioxide, water, and hydrochloric acid. The acid is then removed. Treated soil is placed at the designated CAMU or at an off-base landfill.
21. In-Situ Soil Vapor Extraction (SVE), Offgas Treatment	Contaminated soil vapor is extracted from the ground to remove contaminants. The contaminated vapors are then treated by catalytic or thermal oxidation, which converts VOCs to carbon dioxide, water, and hydrochloric acid. The acid is then removed.
22. In-Situ Bioventing	Air is injected into the ground to encourage the growth of microorganisms in the soil. Microorganisms can help break down certain VOCs.

* Alternatives for soil and sediment are numbered 16 through 22 to be consistent with the numbers used in the FS.

CAMU regulations were written to give regulatory agencies greater flexibility in selecting and implementing the most effective and appropriate waste management strategy for the cleanup of large, complex facilities such as Travis AFB. One of the soil sites in the NEWIOU is LF007 (Landfill 2). Figure 2 shows the proposed CAMU area at LF007. This landfill was used from the 1950s through the 1970s as the base municipal landfill. In order to close the landfill, the state requires adequate coverage (such as asphalt, soil, or clay) over the landfill to minimize water infiltration and erosion. Although the landfill material is covered with soil now, there are areas

where additional material is needed to fill in low spots.

The current Air Force proposal at LF007 is to manage the landfill waste by placing soil into the landfill depressions and over the waste to form a solid foundation. An appropriate engineered cap, which may be constructed from a nearly impermeable substance, such as compacted clay or synthetic material, would be placed over the foundation to prevent people, plants and animals from coming in contact with the waste. In addition, the cap would limit rainwater percolation through the buried waste and the potential for migration of

Table 5
Feasibility Study Costs for Soil and Sediment Alternatives in the NEWIOU*

Site Number	Alternative No. 16 (No Action)	Alternative No. 17 (Institutional Actions/Monitored Natural Attenuation)	Alternative No. 18** (Excavation, Removal to Landfill)	Alternative No. 19 (Cap)	Alternative No. 20 (Excavation, Thermal Treatment)	Alternative No. 21 (Soil Vapor Extraction)	Alternative No. 22 (Biovent)	Preferred Alternative
SD001	\$0	\$100,183	\$300,000	NA	\$3,600,000	NE	NE	18
FT002	\$0	\$12,700	\$300,500	\$383,905	\$2,760,000	NE	NE	18
FT003	\$0	\$112,706	\$2,772,766	\$1,933,905	\$37,600,000	NE	NE	18
FT004	\$0	\$113,166	\$490,000	\$353,905	\$5,900,000	NE	NE	18
FT005	\$0	\$139,470	\$6,400,000	\$3,053,905	\$92,800,000	NE	NE	18
LF007	\$0	\$165,600	\$12,900,000	\$18,091,069	\$187,000,000	NE	NE	18 and 19
OT010	\$0	\$78,005	\$1,370,000	\$1,353,905	\$20,000,000	NE	NE	18
SS015	\$0	\$52,193	\$416,000	\$303,905	\$1,860,000	NE	NE	18
SS016	\$0	\$71,055	\$2,800,000	\$723,905	\$37,000,000	NE	NE	18
WP017	\$0	\$128,410	\$7,360,000	\$2,197,462	\$21,700,000	NE	NE	18
SS029	\$0	\$68,905	\$525,000	\$159,905	\$8,000,000	NE	NE	18
SS030	\$0	\$87,605	\$870,000	\$1,353,905	\$12,800,000	NE	NE	18
ST032	\$0	\$59,485	\$2,360,000	\$1,559,485	\$23,000,000	\$709,558	\$450,646	17 and 18
SD033	\$0	\$91,069	\$2,200,000	\$1,562,229	\$29,000,000	\$1,602,424	\$1,137,127	18
SD033 Sediment	\$0	\$100,183	\$300,000	NA	\$3,400,000	NE	NE	18
SD034	\$0	\$72,564	\$710,000	\$313,905	\$9,150,000	\$234,705	\$186,470	17
SS035	\$0	\$56,918	\$380,000	\$583,905	\$5,100,000	NE	NE	18
SD036	\$0	\$64,284	\$500,000	\$229,485	\$6,440,000	\$260,417	\$180,207	17
SD037	\$0	\$144,866	\$4,000,000	\$1,602,229	\$55,000,000	\$629,033	\$581,674	17 and 18

* Total estimated costs include capital costs plus operation and maintenance costs (present worth).

** Costs for Alternative 18 (Excavation, Removal to Landfill) are based on transport and disposal at an appropriate off-base landfill; costs to consolidate soil from IRP sites at a designated CAMU on base will be much less due to lower transportation costs and no disposal fees. Revised cost analyses based on CAMU and final cleanup levels will be provided in the NEWIOU Soil, Sediment, and Surface Water ROD.

NA = Not Appropriate. Paving of the creek bed was not considered appropriate.

NE = Not Evaluated. Soil Vapor Extraction and Biovent cleanup technologies were evaluated for use with sites contaminated with VOCs or fuels only.

contamination to groundwater. Land use restrictions and fencing would be used to protect the cap by making it inaccessible to people and equipment.

The original cleanup strategy for Landfill 2 required Travis AFB to purchase large amounts of clean soil to form the foundation for the cap. If Travis AFB receives regulatory and public acceptance of the proposal to designate LF007 as a CAMU, then the contaminated soil from other Travis AFB sites that meet consolidation requirements could be used as part of the foundation for the cap. There are several advantages to this approach:

- The CAMU would be protective of human health and the environment. The use of excavated soil from other Travis AFB sites as fill material is protective because the final cap would cover the contaminated soil. The cap would limit exposure of the contaminants to rain; thereby minimizing the downward migration of contaminants. Long-term groundwater monitoring would be conducted to confirm that the contaminants are not moving downward into the groundwater.
- The consolidation of contaminated soil would provide needed material for the construction of the LF007 cap foundation (the cap needs to be constructed whether a CAMU is designated or not). This would reduce the amount of clean soil to be purchased.
- A large quantity of contaminated soil would never have to leave Travis AFB, avoiding the transport of this soil by truck on major roads and highways. This would reduce air emissions, noise, and the risk of vehicle accidents associated with the cleanup actions.
- The amount of soil that would have to go to commercial off-base landfills would be reduced. This would extend the functional life of these landfills.

- The amount of paperwork generated to track the contaminated soil would be reduced, resulting in a project management cost reduction.
- Due to the reduced costs, more cleanup actions could begin sooner. This would in turn allow Travis AFB to complete more cleanup actions each fiscal year.

State and federal regulatory acceptance is a required component of CAMU designation. As part of the ROD, Travis AFB will include an evaluation of the seven separate criteria (different than the criteria used to evaluate remedial alternatives discussed earlier) used to measure the suitability of a CAMU.

A fact sheet or newsletter article and a RAB presentation providing further details on the CAMU, such as cost and soil volume estimates, will be made available to the public. The allowable concentrations of contaminants approved for placement in the CAMU will be provided in the fact sheet or newsletter article and in the Final ROD.

At the time of the writing of this Plan, it is likely, but not certain, that Travis AFB will receive regulatory and public acceptance of the use of a CAMU as a cleanup strategy. Therefore, at those sites where this strategy seems appropriate, the consolidation approach will be considered the primary approach. However, costs for Alternative 18 were developed during the FS process and are based on disposal at an off-base landfill. Consolidation at an on-base CAMU will substantially lower the cost of Alternative 18 due to lower transportation costs and no disposal fees. Cost estimates for excavating the soil and consolidating it in a CAMU will be provided in the NEWIOU Soil, Sediment, and Surface Water ROD.

The Preferred Alternatives

Travis AFB has proposed a preferred remedial alternative for each NEWIOU soil, sediment, and surface water site. The proposals are based on the environmental conditions and the nature and extent of the contamination found at each site. They were developed to reduce the potential exposure (both now and in the future) to contaminants in order to protect human health and the environment. They are also based on the technology and criteria evaluations performed during the NEWIOU FS. Some sites have more than one preferred alternative in order to address different types of contamination or different media that are contaminated. The No Action Alternative has not been selected for any sites. However, once cleanup levels have been agreed on and established in the ROD, some soils sites may not require any cleanup action. The following sections present information on the classes of contaminants found at each site, the alternatives that the Air Force prefers to use at each site and the reasons for these preferences. Information on primary contaminants identified is presented in Table 1. Descriptions of surface water cleanup alternatives and cost estimates are provided in Table 3. Descriptions of soil and sediment cleanup alternatives are provided in Table 4, and cost estimates are provided in Table 5.

Site SD001 – Alternative 18 (Excavation and Removal to Landfill) for Soil and Sediment

Site SD001 contains Union Creek and its associated surface water facilities that follow along the main air strip. Grass and weeds growing along Union Creek are regularly mowed and tilled to prevent birds and other migratory animals from inhabiting the area. PAHs were identified in soil at SD001 and pesticides, PAHs, and metals were identified in the creek sediment. The Air Force proposes to excavate contaminated soils and sediment from Site SD001 and place them in the

CAMU (if designated) or an off-base landfill (Alternative 18). The excavation action would be conducted so that impacts on the existing habitat would be minimized. Other alternatives, such as capping (Alternative 19) were not considered viable.

Site SD001 – Alternative 15 (Source Control) for Surface Water

Pesticides and metals were identified in surface water at SD001. The Air Force proposes **source control** (Alternative 15) as the cleanup alternative for surface water at SD001. Union Creek is not a source of contamination, but may be receiving contaminated water from groundwater or storm sewer contamination upstream. Therefore, cleanup or containment of the contaminated groundwater upstream and excavation of contaminated soil and sediment will clean up the surface water. Additionally, source control will not destroy habitat and will have the lowest impact on the site's plant and animal species. Lessening impact on habitat is important in **riparian** areas like Union Creek because riparian species are sensitive to the area's unique conditions.

Source control (and its associated costs) will be accomplished under the Groundwater IROD. Evaluation of contaminated groundwater migration and appropriate source control actions will be taken per the Groundwater IROD. These actions may include pumping (extracting) and treating the contaminated groundwater; or repair, slip-lining or collaring the storm sewers (Alternative 14) as discussed in the NEWIOU Interim Groundwater Remedial Design/Remedial Action Plan. Water quality will be monitored according to established procedures (such as sampling locations and frequency), used in the **Groundwater Sampling and Analysis Program (GSAP)** to ensure that upstream actions are preventing contaminants from reaching the creek.

**Site FT002 – Alternative 18
(Excavation and Removal to Landfill)**

Site FT002 consists of Fire Training Area 1, used for fire training exercises from 1943 to 1950. During these exercises waste fuel, oils, and solvents were placed on frames or on the ground and burned. Grass areas and parking lots now occupy the site. Contaminants of concern detected at FT002 include lead and metals. The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site. The preference is to remove the contamination to eliminate potential ecological impacts and to allow for industrial use of the site. In addition, Alternative 18 is more cost effective than capping (Alternative 19) which would entail long-term monitoring and maintenance costs.

**Site FT003 – Alternative 18
(Excavation and Removal to Landfill)**

Site FT003 is located in the northeastern portion of the EIOU and consists of the old Fire Training Area 2. Waste fuel, oils, and solvents were burned at this site during fire training exercises from 1950 to 1952. A concrete helicopter pad covers part of the site. Contaminants of concern detected at FT003 include PAHs, metals, pesticides and dioxins. The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site over capping (Alternative 19) even though the latter reflects a lower cost alternative if a CAMU is not approved. The preference is to remove the contamination to eliminate potential human and ecological impacts and to allow for industrial use of the site.

**Site FT004 – Alternative 18
(Excavation and Removal to Landfill)**

Site FT004 covers approximately 30 acres in the northeastern portion of the EIOU and consists of the old Fire Training Area 3. Waste fuel, oils, and solvents were burned at this site during fire training exercises from 1953 to 1962. The site is now an unused, open field. Dioxins and metals were detected in the soil at FT004. The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site over capping (Alternative 19) even though the latter reflects a lower cost alternative if a CAMU is not approved. The preference is to remove the contamination to eliminate potential human and ecological impacts and to allow for industrial use of the site.

**Site FT005 – Alternative 18
(Excavation and Removal to Landfill)**

Site FT005 covers approximately 30 acres in the southeastern portion of the EIOU. The contaminated soil includes approximately 6.5 acres. The site includes the old Fire Training Area 4 used for fire training exercises from 1962 through approximately 1987. From 1962 until the early 1970s, waste fuels, oils, and solvents were burned at the site during training exercises. From the early 1970s until FTA-4 was closed, only waste fuels were burned. PCBs, metals, PAHs, dioxins, and pesticides have been identified in the soil at FT005. The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site over capping (Alternative 19) even though the latter reflects a lower cost alternative if a CAMU is not approved. The preference is to remove the contamination to eliminate potential human and ecological impacts and to allow for industrial use of the site.

**Site LF007– Alternatives 18
(Excavation and Removal to Landfill)
and 19 (Capping)**

Site LF007 is located at old Landfill 2 and occupies approximately 73 acres in the NOU. The landfill was operated in a trench-and-cover method beginning in the early 1950s through 1974. The landfill was used primarily for the disposal of general refuse, such as wood, glass, and construction debris. From the early 1950s until 1964, a portion of the eastern part of the landfill was used for storage of excess and waste materials, including oils, hydraulic fluid, and solvents for resale or disposal. Contaminants of concern identified in soil at LF007 include PAHs, PCBs, SVOCs, and metals. The Air Force proposes to cap (Alternative 19) areas with PAHs, SVOCs, and metals contamination. Alternative 19 will allow Travis AFB to properly manage the landfill without transferring the soil to another landfill off base. Alternative 19 meets all of the CERCLA evaluation criteria except the reduction of the contamination; however, based on experience at many similar sites, the U.S. EPA often favors capping of landfills, when there are adequate safeguards against migration of the contaminants. In addition, a portion of LF007 with PCB contamination in the surface soil would be excavated (Alternative 18) and consolidated under the landfill cap. As described on page 9, LF007 is proposed for CAMU designation; however, areas within LF007 will need to be capped and closed to meet state and federal requirements whether a CAMU is approved or not.

Within LF007, there are **vernal pools** that have resulted from settling of the landfill material. Even though the pools are not natural, Travis AFB plans to mitigate the loss of any vernal pools that results from the excavating, regrading, and capping of the landfill. The mitigation may involve creating or restoring habitat in existing **wetlands** elsewhere, or creating or improving wetlands on Travis AFB.

**Site OT010 – Alternative 18
(Excavation and Removal to Landfill)**

Site OT010 is located in an inactive area of the base in the southeastern portion of the EIOU. It includes a sludge disposal site situated between Union Creek and multiple **oxidation ponds**. Metals, pesticides, and PAHs have been identified in the soil at OT010. The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site over capping (Alternative 19) even though the latter reflects a lower cost alternative if a CAMU is not approved. The preference is to remove the contamination to eliminate potential ecological impacts and to allow for industrial use of the site.

**Site SS015 – Alternative 18
(Excavation and Removal to Landfill)**

Site SS015 is located in the northwestern part of the EIOU and is comprised of the Solvent Spill Area (SSA) and Facilities 550 and 552. The SSA covers approximately 1.4 acres east of Facility 550 in an area previously used for stripping paint from aircraft. Solvent spills were reported to have occurred in the area east of Facility 550. The site is currently an open grassy plot adjacent to an asphalt driveway and Facility 552. Facility 552 consists of a fenced, bermed concrete pad constructed in 1964 that is currently used as a temporary hazardous waste collection point. Contaminants of concern identified at SS015 include PAHs and metals. The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site over capping (Alternative 19) even though the latter reflects a lower cost alternative if a CAMU is not approved. The preference is to remove the contamination to eliminate potential human and ecological impacts and to allow for industrial use of the site.

Site SS016 – Alternative 18
(Excavation and Removal to Landfill)

Site SS016 is located in the center of the EIOU and is comprised of the Oil Spill Area (OSA) and Facilities 11, 13/14, 20, 42/1941, 139/144, and the Storm Sewer Right of Way (SSRW). The OSA covers approximately 7 acres north of Facility 16. The OSA originally encompassed an area where waste oil had reportedly been spilled or disposed of on a grassy area. The area is now paved. PAHs and PCBs were identified in the soil at SS016.

The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site over capping (Alternative 19) even though the latter reflects a lower cost alternative if a CAMU is not approved. The preference is to remove the contamination to eliminate potential human and ecological impacts and to allow for industrial use of the site.

Site WP017 – Alternative 18
(Excavation and Removal to Landfill)

Site WP017 is located in an inactive southeastern area of the EIOU. Approximately 30 percent of the site is covered by sewage treatment plant oxidation ponds used from the 1950s to the late 1970s. The treatment plant processed both domestic and industrial wastes. Ponds along the southern base boundary were used from the late 1970s to 1990 for burial of construction materials and landscape debris. Contaminants of concern identified at WP017 include PCBs, metals, and pesticides. The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site over capping (Alternative 19) even though the latter reflects a lower cost alternative if a CAMU is not approved. The preference is to remove the contamination to eliminate potential human and ecological impacts and to allow for industrial use of the site.

Site SS029 – Alternative 18
(Excavation and Removal to Landfill)

Site SS029 consists of approximately 5.5 acres around Monitoring Well (MW) 329 in the southern part of the EIOU just south of the runway. PAHs, VOCs, SVOCs, and metals have been identified in the soil at SS029. The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site over capping (Alternative 19) even though the latter reflects a lower cost alternative if a CAMU is not approved. The preference is to remove the contamination to eliminate potential ecological impacts and to allow for industrial use of the site.

Site SS030 – Alternative 18
(Excavation and Removal to Landfill)

Site SS030 covers approximately 1.6 acres in the southern portion of the EIOU near the southern base boundary. The site is adjacent to a radar facility (Facility 1125); however, historical aerial photographs do not indicate any staining in the area or activities that may have been the source of contamination. Contaminants of concern found in the soils at SS030 include low levels of PAHs, metals, VOCs, and SVOCs. The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site. The preference is to remove the contamination to eliminate potential ecological impacts and to allow for industrial use of the site. In addition, Alternative 18 is more cost effective than capping (Alternative 19) which would entail long-term monitoring and maintenance costs.

**Site ST032 – Alternative 18
(Excavation and Removal to Landfill) and
Alternative 17 (Monitored Natural Attenuation)**

Site ST032 is located in the central part of the EIOU and the soil is contaminated with metals, VOCs, PAHs, pesticides, and PCBs. The Air Force proposes excavation and removal to a landfill of this portion of the contaminated soil (Alternative 18) over capping (Alternative 19) even though the latter reflects a lower cost alternative if a CAMU is not approved. The preference is to remove the contamination to eliminate potential human and ecological impacts and to allow for industrial use of the site.

Other portions of this site contain fuel contamination that readily undergoes natural degradation at the concentrations found. This process happens as naturally occurring microorganisms in the soil feed on and breakdown the fuel contaminants. No additional treatment is needed as there are no chlorinated hydrocarbons present. Breakdown of the fuel contamination is verified through a process called **Monitored Natural Attenuation** (Alternative 17) where groundwater monitoring wells are sampled periodically to ensure that contaminant breakdown is occurring and that groundwater is not being affected. The regulatory agencies will approve closure of natural attenuation sites on a site-by-site basis. In the event that any effects on groundwater are noted, natural attenuation may not be appropriate and other alternatives will be considered. Fuel product floating on the surface of the groundwater at this site is being removed under a separate cleanup action being taken under the Groundwater IROD. The removal of the free (or floating) product will enhance the cleanup of the soil at this site by allowing the natural degradation process to proceed.

**Site SD033 – Alternative 18
(Excavation and Removal to Landfill)
for Soil and Sediment**

Site SD033 includes the west branch of Union Creek, parts of Storm Sewer II (previously called Storm Sewer System B), Facilities 810 and 1917, the area around the South Gate, and Outfall II. These facilities are included as one site because past activities at either of these locations have been identified as a possible contaminant source for Storm Sewer II. Facility 810 is used for aircraft refurbishing activities. An oil/water separator (OWS), sump, and wash rack that used to be located at the facility and discharged to Storm Sewer II have been abandoned; the facility no longer discharges to the storm sewer. Wastes generated at the facility in the past have included paints, solvents, lubricants, PCBs, and fuels. Facility 1917 was used as an aircraft washdown area. An OWS and wastewater collection sumps previously used during washdown activities remain at the facility but are no longer in use. Wastes generated at the facility during past activities include solvents, soaps, engine oil, hydraulic fluid, and jet fuel. VOCs, PAHs, and metals were identified in sediment at SD033. Surface soil samples identified metal contamination. The Air Force proposes to excavate contaminated soils and sediment from Site SD033 and place them in the CAMU (if designated) or an off-base landfill (Alternative 18). The excavation action would be conducted so that impacts on the existing habitat would be minimized. Other alternatives, such as capping (Alternative 19) were not considered viable.

**Site SD033 – Alternative 15
(Source Control) for Surface Water**

Metals are the contaminant of concern in surface water at SD033. The preferred alternative for surface water contamination is source control (Alternative 15). The West Branch of Union Creek is not a source of contamination, but may be receiving contaminated water from groundwater or storm sewer contamination upstream. Therefore cleanup or containment of the contaminated groundwater upstream and excavation of the contaminated soil and sediment will clean up the surface water. Additionally, source control will not destroy habitat and will have the lowest impact on the site's plant and animal species. Lessening impact on habitat is important in riparian areas like the West Branch of Union Creek because riparian species are sensitive to the area's unique conditions.

Source control (and its associated costs) will be accomplished under the Groundwater IROD. Evaluation of contamination groundwater migration and appropriate source control actions will be taken per the Groundwater IROD. These actions may include pumping (extracting) and treating the contaminated groundwater; or repair, slip-lining or collaring the storm sewers (Alternative 14) as discussed in the NEWIOU Interim Groundwater Remedial Design/Remedial Action Plan. Water quality will be monitored according to established procedures (such as sampling locations and frequency), used in the GSAP to ensure that upstream actions are preventing contaminants from reaching the creek.

**Site SD034 – Alternative 17
(Monitored Natural Attenuation)**

Site SD034 encompasses Facility 811, located in the northern portion of the WIOU. Facility 811 includes an indoor washrack that is used to wash, strip, and treat aircraft parts prior to painting. Wastewater from the washrack flows into an OWS. Flow from the OWS can be directed into either the sanitary sewer or a concrete-lined overflow pond located just west of the facility. The OWS was removed and replaced after a hole in it was discovered in 1994. The soil at this site is contaminated with fuel only, so the Air Force proposes Monitored Natural Attenuation (Alternative 17) to clean it up. Groundwater monitoring wells will be monitored periodically to ensure that groundwater is not being affected. Because these petroleum products should readily degrade, no additional treatment is needed to remove the contamination from the soil. Fuel product floating on the surface of the groundwater at this site is being removed under a separate cleanup action being taken under the Groundwater IROD. The removal of the free (or floating) product will enhance the cleanup of the soil at this site by allowing the natural degradation process to proceed.

**Site SS035 – Alternative 18
(Excavation and Removal to Landfill)**

Site SS035 contains Facilities 818 and 819 and includes a wash area, an OWS and sump, a hydraulic lift storage area, and a hazardous materials accumulation area. Asphalt and roadbase cover most of this site though there is some exposed soil and grass along the east end of Facility 818. PCBs and metals were detected in the soil at SS035. The Air Force proposes excavation of the contaminated soil and removal to a landfill (Alternative 18) for this site. The preference is to remove the contamination to eliminate potential ecological impacts and to allow for industrial use of the site. In addition, Alternative 18 is more cost effective than capping (Alternative 19) which would entail long-term monitoring and maintenance costs.

**Site SD036 – Alternative 17
(Monitored Natural Attenuation)**

Site SD036, located in the western central portion of the WIOU, includes Facilities 872, 873 and 876. The site, while mostly paved, is surrounded by buildings and is situated in an active area of the base. The soil at this site is contaminated with fuel only, so the Air Force proposes Monitored Natural Attenuation (Alternative 17) for clean up. Because these petroleum products should readily degrade, no additional treatment is needed to remove the contamination from the soil.

**Site SD037 – Alternative 18
(Excavation and Removal to Landfill) and
Alternative 17 (Monitored Natural Attenuation)**

Site SD037 encompasses a large portion of the WIOU, including Facilities 837/838, 919, 977, and 981; the Ragsdale/V area; and the Area G Ramp. Operations at these facilities have included an OWS, sumps, washracks, and a fuel hydrant system. PAHs, VOCs, SVOCs, and metals were identified in the soil at this location. The Air Force proposes excavation and removal to a landfill of this portion of the contaminated soil (Alternative 18) over capping (Alternative 19) even though the latter reflects a lower cost alternative if a CAMU is not approved. The preference is to remove the contamination to eliminate potential human and ecological impacts and to allow for industrial use of the site. Portions of this site are contaminated with fuel only, so the Air Force proposes Monitored Natural Attenuation (Alternative 17) for clean up at these locations. Because these petroleum products should readily degrade, no additional treatment is needed to remove the contamination from the soil.

Community Involvement is Key

As a member of the local community, your thoughts on the cleanup issues presented in this Proposed Plan are important to the decision-making process. The preferred alternatives presented in this Plan are preliminary, and could change in response to public comments or other new information.

You have several options available to ensure that your voice is heard.

- Talk to us. There will be time during the public meeting on July 23, 1998 to let us know what you think of the proposed actions. If you are unable to attend the meeting, please call the Travis AFB Environmental Management Office at (707) 424-7520, and ask for Dale Malsberger, our NEWIOU Project Manager.
- Write to us at the address on the back cover. You could write your comments and drop them off at the meeting, or you could mail your comments to Dale Malsberger or the regulatory agency representatives listed on the back cover.
- Send us an e-mail. Travis AFB and the agency representatives also respond to e-mail from the public. Their e-mail addresses are on the back cover.
- You are invited to attend quarterly Travis AFB **Restoration Advisory Board (RAB)** meetings to find out more about the cleanup program. The next meeting will follow the public meeting on July 23, 1998.

Thank you in advance for your time and support of these important issues that affect us all.

Glossary

Applicable or Relevant and Appropriate Requirements (ARARs)—All of the laws or regulations that may apply to a remedial action, for example, air emissions regulations for a groundwater treatment system.

Bioventing—During bioventing, clean air is blown into the ground through perforated injection wells located in the area of contamination. This provides oxygen that naturally occurring microorganisms need to feed on, multiply, and break down the contaminants.

Chemicals of Potential Ecological Concern (COPECs)—Chemicals that are likely to have health, reproductive, or other impacts on plants or animals.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)—Also known as Superfund, CERCLA was passed in 1980 and was designed to respond to the past disposal of hazardous substances. These activities include establishing the National Priorities List, investigating sites for inclusion on the list, determining their priority level on the list, and conducting and/or supervising the ultimately determined cleanup and other remedial actions. The law was extensively amended in 1986 by the Superfund Amendment and Reauthorization Act (SARA), which added many provisions and clarified unclear areas in the original law.

Contaminant of Concern (COCs)—Contaminant that poses a potential to humans and/or plants and animals.

Corrective Action Management Unit (CAMU)—A CAMU is a designated area of land where remediation of Resource Conservation and Recovery Act of 1976 (RCRA) regulated hazardous waste can take place and the Land Disposal Restrictions (LDR) or the Minimum Technology Requirements (MTR) for disposal facilities can be relaxed. U.S. EPA proposed the CAMU in order to provide incentives to

owner/operators to speed the cleanup process, encourage more on-site management of the wastes, greater reliance on innovative technologies, and a lesser reliance on incineration and capping of non-treated wastes in place.

Dioxin—A family of compounds known chemically as dibenzo-p-dioxins. Concern about them arises from their toxicity and contaminants in commercial products. Tests on laboratory animals indicate them to be one of the most toxic chemical groups known.

Ecological Risk—A qualitative or quantitative estimate of the potential impact on local plants and animals of exposure to chemicals detected in the environment. The information is used to help evaluate the need for and extent of a cleanup action at a site.

Endangered Species Act—Provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found.

Exposure Pathways—The course a chemical compound takes from a source to an exposed organism. For example, a solvent spilled onto the ground surface may migrate to groundwater, which could then be used for drinking water. If the community does not use groundwater for drinking water, then this exposure pathway is said to be incomplete.

Ex-Situ—Moved from its original place; excavated; removed or recovered from the subsurface.

Feasibility Study (FS)—An engineering and cost study that identifies and evaluates alternatives for cleaning up the contamination.

Federal Facilities Agreement (FFA)—Memorandum of understanding between the federal facility military installation (in this case, Travis AFB), U.S. EPA, and the state regulatory agencies. The FFA provides schedules and timelines for investigation and cleanup.

Groundwater—Underground water fills spaces between particles of sand, soil, gravel, or openings in rocks. When groundwater occurs in enough quantity, it can be used as a source of water supply.

Groundwater Sampling and Analysis Program (GSAP)—An ongoing program for monitoring groundwater contaminant concentrations, flow directions, and other conditions. Results are used to evaluate the potential for contaminants to move and the effectiveness of cleanup actions.

Human Health Risk—The potential for a person to develop a disease or other adverse health effect as a result of exposure to a contaminant. This risk is generally expressed in terms of a probability. For plants and animals, the term "ecological risk" is used.

Information Repository—A storehouse where members of the public may review IRP documents. Usually, information repositories are located at libraries or other public locations.

Inorganic Compounds—A compound that does not contain carbon.

In-Situ—In its original place; unmoved; unexcavated; remaining in the subsurface.

Installation Restoration Program (IRP)—The Air Force's program to address contamination in the environment.

Interim Record of Decision (IROD)—A public, legally binding document explaining cleanup alternatives that will be used at a site until the final remedy is selected. The IROD is based on information and technical analyses generated during the RI/FS and consideration of public comments and community concerns.

Maximum Contaminant Levels (MCLs)—The maximum permissible level of contamination in water delivered to any user of a public water system. MCLs are enforceable standards.

Monitored Natural Attenuation—Contaminants are degraded (broken down) into harmless components by microorganisms that naturally live in the subsurface. The contamination is monitored to ensure breakdown occurs and contaminants do not migrate. Additional institutional actions are usually taken to prevent potential exposure (for example, controls to restrict excavations in contaminated areas).

National Priorities List (NPL)—Also known as the Superfund list. The official U.S. EPA list of top priority hazardous substance release sites in the country that are eligible for investigation and cleanup under CERCLA.

Offgas Treatment—Treatment of organic compounds and gases generated after extraction.

Operable Units (OUs)—At Travis AFB, an Operable Unit is a geographic area investigated as one entity. Operable Units may address geographic portions of a site, types of operations, specific site problems, or the initial phase of an action.

Organophosphorus—A type of pesticide. They are short-lived, but some can be toxic when first applied.

Oxidation Ponds—A body of water constructed to allow waste to be consumed by bacteria. Used most frequently with other waste treatment processes.

Parts Per Billion (ppb)—A measurement of the concentration of a substance present; one part is present out of 1 billion parts. A ppb is about the equivalent of one drop of water in a full Olympic-sized swimming pool.

Parts Per Million (ppm)—A measurement of the concentration of a substance present; one part is present out of 1 million parts. A ppm is about the equivalent of one drop of liquid in a full tank of gas in a full-sized car.

Pesticides—Are chemicals used to control insects, rodents, weeds, etc. Two classes of organic pesticides include chlorinated pesticides and organophosphorus pesticides.

Petroleum Hydrocarbons—Fuel products, lubricant oils, or the by-products of the degradation or incomplete combustion of fuels. Some evaporate easily and are also classified as VOCs.

Polychlorinated Biphenyl (PCB)—A group of synthetic oily liquids or solids used widely in the past as coolants, insulating materials, and lubricants in electrical equipment like transformers and capacitors.

Polycyclic Aromatic Hydrocarbons (PAHs)—A type of SVOC that are by-products of incomplete burning of petroleum. PAHs are found in areas of asphalt pavement, fire training areas, and areas where there is ongoing burning of petroleum products such as diesel engines. Certain PAH compounds, such as benzo(a)pyrene, are carcinogenic, and may have significant acute toxicity to some organisms.

Preliminary Remediation Goals (PRGs)—Human risk-based goals suggested by U.S. EPA for evaluating contamination in different media (such as soil or water). These goals are designed to be health protective and are generally used for screening purposes and are not actual cleanup goals.

Receptor—A living thing (person, animal, or plant) that could come into contact with contaminated media.

Record of Decision (ROD)—A public, legally binding document explaining cleanup alternatives (see IROD). The ROD differs from the IROD by documenting the final cleanup levels—that is, how clean the soil must be before contaminant problems are considered resolved.

Remedial Actions—Actions taken to clean up contamination including actual construction of the remedy or implementation phase of site cleanup.

Remedial Design—The engineering phase of the Superfund process. During this phase, technical drawings and specifications are developed for the Remedial Action.

Remedial Investigation (RI)—The investigation phase of the Superfund process. The RI examines the nature and extent of site contamination.

Remediation—To clean up or isolate contamination from an area so the area can be used for other purposes without fear of exposing humans, plants, or animals to adverse environmental conditions.

Responsiveness Summary—The section within the ROD that summarizes comments received from the public during the public comment period, and provides lead agency (U.S. Air Force) responses.

Riparian—Areas adjacent to rivers and streams with a differing density, diversity, and productivity of plant and animal species relative to nearby uplands.

Sediment—The layer of soil, sand, and minerals that covers the bottoms of creeks, lakes, rivers, and oceans that often absorbs contaminants.

Semivolatile Organic Compound (SVOC)—An organic compound, such as a heavy fuel or oil, that evaporates (or volatilizes) only very slowly at normal temperature and pressure.

Site—In Superfund terms, a “Site” with a capital “S” is a facility of any kind where contamination is present because of a release of hazardous material from the facility. Thus, Travis AFB is the Superfund Site. The term “site” with a small “s” generally means a specific location or facility within the site where contaminants have been released to the environment.

Soil Vapor Extraction (SVE)—The process of vacuuming volatile contaminants (such as solvents or fuels) out of soil, to the surface where they can be treated.

Source Control—The treatment of contamination at the point of origin.

Special Status Species—Those species designated endangered or threatened, or are candidates for such listing, by the U.S. Fish and Wildlife Service or the California Fish and Game Commission.

Superfund—*See CERCLA definition.*

Surface Water—All water naturally open to the atmosphere (creeks, rivers, lakes, reservoirs, streams, impoundments, seas, estuaries, etc.).

Vernal Pool—A shallow depression or small pool that fills with water during the winter rainy season, then dries out during the spring. The vernal pool, a type of wetlands, is a habitat for various unique plants and animals.

Volatile Organic Compounds (VOCs)—Carbon-containing liquids or gases that often contain halogens. If not already a gas, these compounds are typically able to evaporate or vaporize at or near room temperature. VOCs are commonly used in electronics manufacture, metal degreasing, and dry cleaning.

Wetlands—Lands that are sometimes or always covered by shallow water or have saturated soils, and where plants adapted for life in wet conditions usually grow.

Travis AFB

Public Meeting

7:00 p.m. - July 23, 1998
Fairfield Senior Center
1200 Civic Center Drive
Fairfield, California

Points of Contact

Dale Malsberger
NEWIOU Project Manager

60 AMW/EMR
580 Hickam Avenue
Travis AFB, CA 94535-2176

(707) 424-7520

dale.malsberger@travis.af.mil

Jose Salcedo
DTSC Project Manager

10151 Croydon Way, Suite 3
Sacramento, CA 95827-2106

(916) 255-3741

jsalcedo@juno.com

John Lucey
U.S. EPA Program Manager

75 Hawthorne Street, (SF-D-1)
San Francisco, CA 94105

(415) 744-2222

lucey.john@epamail.epa.gov

Location of Information Repository

Vacaville Public Library
1020 Ulatis Drive
Vacaville, CA 95688

Mon & Thurs. 12-8
Tues. & Wed. 10-6
Sat. 10-5
Closed Friday and Sunday

(707) 449-6290

