



BASEWIDE OPERABLE UNIT PROPOSED PLAN

Preferred Alternatives for Final Cleanup of the Former Base

1. Purpose

The Air Force Real Property Agency is issuing this ***Proposed Plan*** for the Basewide ***Operable Unit*** to seek public comments on the Air Force's environmental investigation and cleanup efforts at the former Norton Air Force Base (AFB). The Proposed Plan summarizes past and planned environmental cleanup activities for the former base. It also identifies the alternatives the Air Force believes are the best solutions for protection of human health and the environment.

Note: Key terms in bold italics are defined on pages 15 and 16.

You have an opportunity to review and comment on the Proposed Plan during the public comment period (see details below).

In order to facilitate reuse of Norton and transfer the property to the community, cleanup of most of the environmental contamination was completed under an accelerated program, legally termed, utilizing ***Removal Action*** provisions of the ***Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)***. This federal law directs cleanup of contaminated sites at Norton. The cleanup actions involved removal of contaminated soil to levels protective of human health and the environment based on the

How You Can Be Involved

The two ways you can be involved to tell us what you think of this Proposed Plan are: (1) send us comments in writing during the comment period, or (2) tell us in person at the meeting.

Public Comment Period

28 July 2004 through 27 August 2004 (30 days)

Public Meeting

11 August 2004, 6:30 p.m.

San Bernardino City Council Chambers
300 North D Street, San Bernardino, California

The Air Force will present a summary of the Proposed Plan. You will be able to ask questions and comment on the cleanup alternatives. The Air Force will record oral comments and respond to comments (oral and written) in the final decision document. A final cleanup decision will not be made until all comments are considered.

Mail (or E-mail) your written comments to:

Air Force Real Property Agency
Attention: Philip H. Mook, Jr., Regional
Environmental Coordinator
3411 Olson Street, McClellan, CA 95652-1003
philip.mook@afarpa.pentagon.af.mil

For more information, see the Administrative Record at:

Norman Feldheym Central Library, California Room
555 West Sixth St., San Bernardino, California
909-381-8208 or 909-381-8226

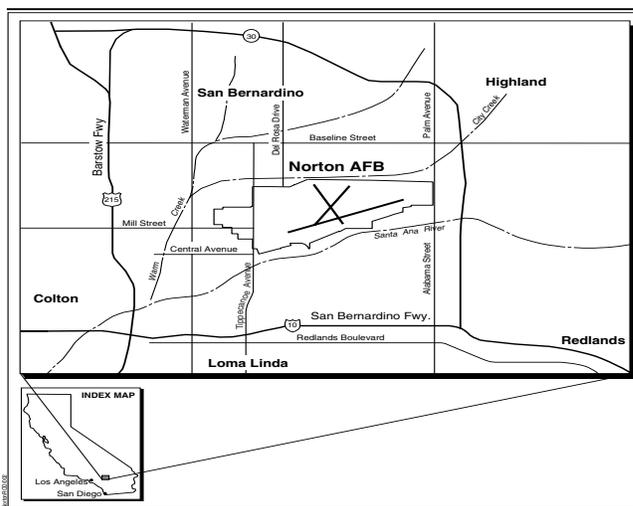
continued use of the property for industrial purposes. The Air Force is cleaning as much of the property as possible to meet residential standards because land use may change over the long-term and residual contamination can persist for many years. The evaluation of residential standards is presented in the *Former Norton AFB Basewide Operable Unit Feasibility Study*.

The *feasibility study* assessed all locations with soil and groundwater contamination above residential (unrestricted use) standards and evaluated remedial options to address this contamination. Based on the results of the feasibility study, only limited further action is required to protect human health and the environment.

Section 117 of CERCLA requires public involvement in decisions related to the cleanup and closure of sites. This Proposed Plan addresses the community involvement requirements of CERCLA. The Air Force is seeking public comment on the decisions described in this Proposed Plan (see box on page 1). Based on comments provided by the public, the Air Force may consider other actions if they are deemed necessary to provide additional protection to human health and the environment at the former base.

The environmental documents describing the Air Force’s investigation and cleanup activities are available in the Norton AFB Information Repository located at the Norman Feldheym

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Location of Norton AFB
Figure 1

Central Library, 555 West Sixth Street, San Bernardino, California 92410.

2. Site Background

The former Norton AFB is in the City of San Bernardino, California, 55 miles east of Los Angeles and 50 miles west of Palm Springs (Figure 1). The base consisted of 2,127 acres. Two-thirds comprised an airfield, and one-third comprised support areas for military activities. The base was activated in March 1942 and primarily served as an aircraft repair center for the Air Force. During its later years of operation, Norton AFB also served as a military airlift wing providing transport of military supplies to bases worldwide. In 1988, Norton AFB was identified for closure pursuant to the Base Closure and Realignment Act of 1988. The base was officially closed in March 1994. The *Environmental Impact Statement for Disposal and Reuse of Norton AFB, California*, issued in 1990, presents an evaluation of the proposed reuses of the base.

Environmental investigation of chemical and waste handling and disposal practices was initiated in 1982 under the Air Force’s ***Installation Restoration Program (IRP)***. A 1982 records search identified 20 locations (termed IRP sites) with suspected contamination. These 20 sites, together with two additional sites identified during the 1984 to 1986 IRP investigation, comprise the 22 Norton IRP sites. All but one of the 22 sites are addressed in this Proposed Plan.

IRP Site 9, the Electroplating Shop, was addressed under the Central Base Area Record of Decision, briefly described in Section 4. The IRP process is illustrated below in Figure 2.

In July 1987, Norton AFB was placed on the *U.S. Environmental Protection Agency's (EPA's) National Priorities List* of hazardous waste sites due to the presence of the solvent *trichloroethylene (TCE)* in groundwater beneath the base. This required the Air Force to initiate the process outlined in the *National Oil and Hazardous Substances Contingency Plan (NCP)* for hazardous waste site cleanup. To facilitate the review and approval of environmental investigations and cleanup of the base, the Air Force entered into a Federal Facilities Agreement with the EPA and the State of California in 1989. Since 1989, representatives from EPA Region IX, the *California Department of Toxic Substances Control (DTSC)*, and the *California Regional Water Quality Control Board (RWQCB)* have met regularly with Air Force staff to review and discuss progress of the environmental cleanup.

Prior to closure and as part of the IRP, the Air Force began a comprehensive *remedial investigation* of the entire base for the presence of soil and groundwater contamination. The Air Force conducted a number of records searches that resulted in the identification of *73 Areas of Concern (AOCs)*. An AOC is defined as any base location with a history of chemical use, but with no record of chemical disposal. By contrast, the

IRP sites are locations where chemical waste storage and/or disposal activities were reported to have occurred. Locations with sufficient contamination that posed a threat to human health, groundwater resources, and/or the environment have been investigated, evaluated for need of a remedy, and, in some cases, a removal action has been implemented. Figure 3 shows the former base and IRP/AOC sites.

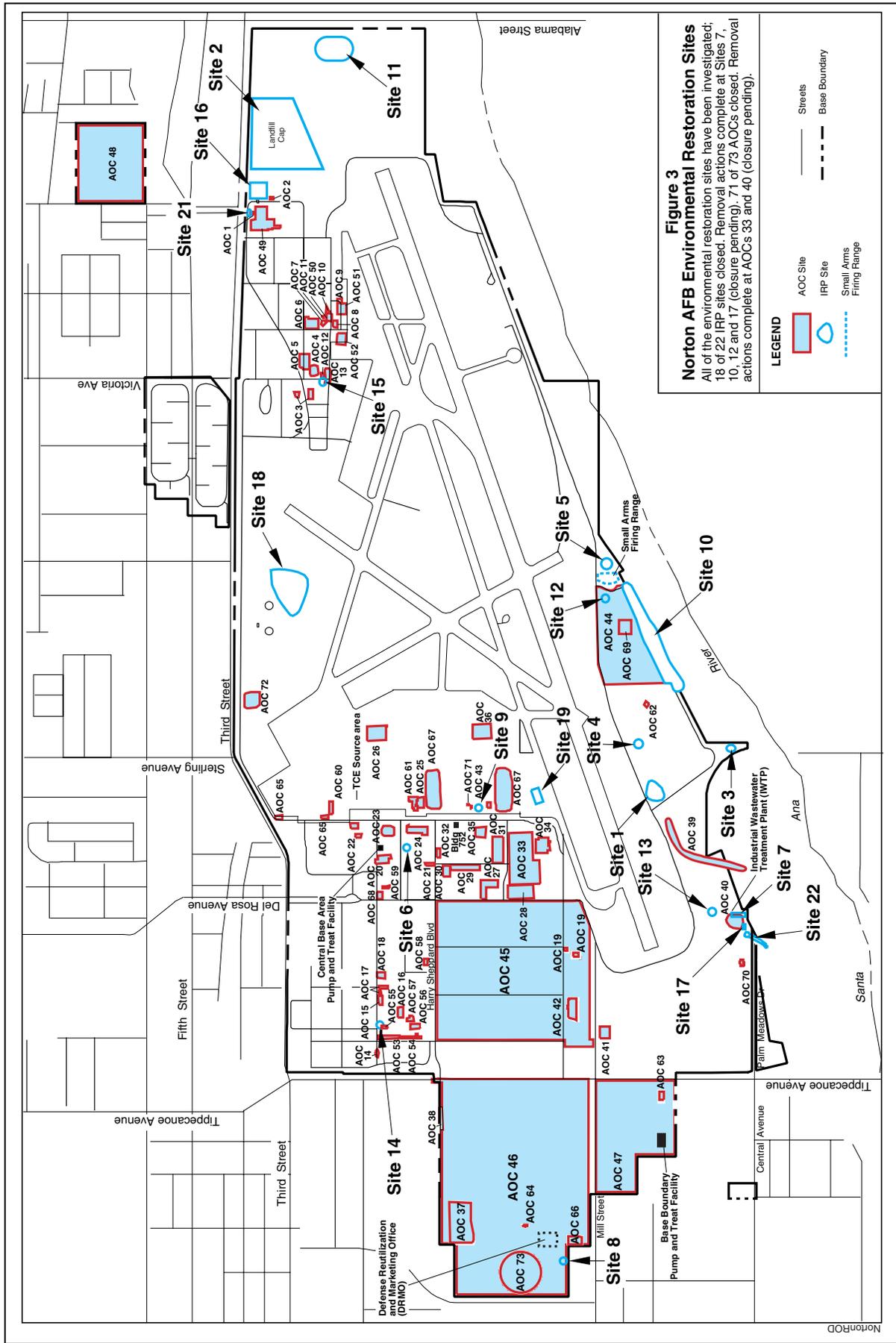
Norton AFB has been subject to more than 20 separate environmental investigations resulting in numerous cleanup actions. The environmental work has been described in more than 100 environmental documents, all of which are available for public review in the Norton AFB *Administrative Record*. The identification and cleanup of contaminated sites at Norton AFB was performed in accordance with the process developed by EPA and described in the NCP. The table on page 10 summarizes the sites that require additional evaluation in the Record of Decision. Most of the IRP Sites and AOCs were determined to require *No Further Action*. These sites are listed in the table on page 13. These sites have been investigated and were determined to have either no contamination or the site was cleaned up to meet regulatory requirements.

In addition to the investigation and cleanup of IRP sites and AOCs, several other environmental actions were taken by the Air Force. These actions include removal of

**Figure 2
CERCLA Process**

CERCLA is a federal law passed in 1980 which established procedures for the investigation and cleanup of hazardous sites. The sequence of primary milestones during site investigation and cleanup are shown below.

NPL Listing	Remedial Investigation (RI)	Removal Action	Feasibility Study (FS)	Proposed Plan	Record of Decision	Remedial Design	Remedial Action
<ul style="list-style-type: none"> Norton Air Force Base was listed July 1987 	<ul style="list-style-type: none"> Characterize site Evaluate risk to human health and the environment 	<ul style="list-style-type: none"> Eliminate immediate threats to human health and the environment 	<ul style="list-style-type: none"> Develop cleanup options Choose preferred options 	<ul style="list-style-type: none"> Identify preferred cleanup options Solicit public review and comment 	<ul style="list-style-type: none"> Document selected remedies Respond to public comments 	<ul style="list-style-type: none"> Develop engineering and/or administrative plans 	<ul style="list-style-type: none"> Implement the selected remedies



underground storage tanks, the industrial waste treatment plant, heating oil line, the jet fuel storage system, and more than 150 agricultural, monitoring and other wells. As part of their commitment to clean up the former base, the Air Force also completed the investigation of basewide radionuclides, preparation and coordination of the Conservation Management Plan, closure of the Defense Reutilization and Marketing Office facility, and cleanup of Building 752 interior radium paint waste.

3. Summary of Site Characteristics

The site's current zoning and land use is industrial/commercial. However, the remedy selected by the Air Force is protective for residential use for almost all sites. Zoning for most of the former base and surrounding area is industrial/commercial. The aquifer beneath Norton AFB provides drinking water to local communities. The preferred alternatives presented in this Proposed Plan are primarily based upon the protection of human health; however, remedy implementation will also protect groundwater quality and the environment. No areas of historical significance or wetlands will be adversely affected by the actions proposed by the Air Force. The sensitive habitat is protected by the Conservation Management Plan signed by the Air Force, the U.S. Fish and Wildlife Service, and San Bernardino International Airport Authority and will be included in the deed restrictions.

4. Scope and Role of the Basewide Operable Unit

The site is divided into two Operable Units: the Central Base Area and Basewide. The Basewide Operable Unit is defined as soil- and groundwater-contaminated sites that were not addressed as part of the Central Base Area Operable Unit. The Basewide Operable Unit encompasses the entire base including the airfield and undeveloped areas, and includes 21 IRP sites and 73 AOCs. The Basewide Operable Unit Feasibility Study includes a description of all IRP sites and AOCs, their historical practices, results of remedial investigations, cleanup efforts completed to date, and any remaining residual

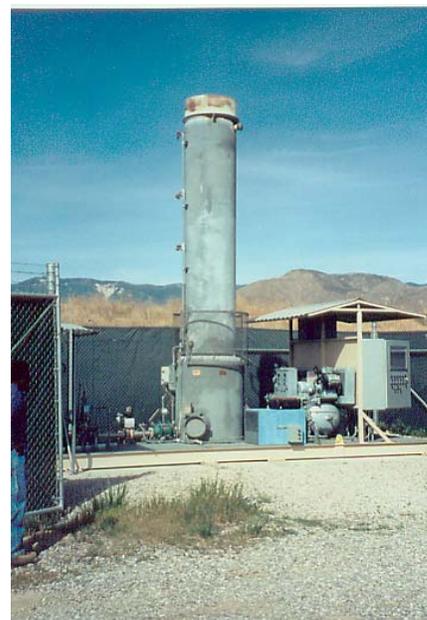
contamination. Sites that were determined to have either no contamination or contamination within acceptable levels were not evaluated for potential remedial action in the feasibility study.

Several sites (see table on page 13) were cleaned up as a result of removal actions that were based on the findings of the remedial investigations. After completion of site investigations and removal actions, eight IRP sites (1, 5, 7, 10, 12, 13, 17, and 19), six AOCs (4, 18, 33, 39, 40, and 70), the Small Arms Range, and Building 752 exterior pipeline were evaluated for risk to human health and the environment during the Basewide Operable Unit feasibility study.

Although the Central Base Area Operable Unit *Record of Decision* addressed groundwater contamination from Norton that impacted the water supply,

residual contaminants at several Basewide Operable Unit sites were evaluated in the feasibility study to determine if they posed a potential future threat to groundwater quality.

The feasibility study evaluated a tetrachloroethylene (PCE) plume beneath IRP Site 2, and a PCE plume in the Northeast The Basewide



IRP Site 2 Landfill. General refuse, including used solvents, acids, refrigerants, paints, waste oil, and sludge, was disposed at the landfill from 1958 to 1980. Organic gases produced by the decomposing refuse in the landfill are extracted using an "active" (blower-assisted) gas collection system. Gases are extracted through piping beneath the landfill and transported to the flare station. Gas is destroyed at the flare station in accordance with South Coast Air Quality Management District requirements.

Operable Unit Feasibility Study concluded that neither area affects or threatens to affect the quality of the community water supply wells.

The feasibility study also evaluated two areas of perched-zone groundwater contamination associated with IRP Sites 1 and 17. The IRP Site 1 contamination consists of chlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene. The IRP Site 17 contamination consists of TCE. The evaluation was performed using soil leachate modeling, which indicated that no perched-zone contaminants would migrate to the drinking water aquifer at concentrations exceeding any respective maximum contaminant level (MCL). The MCL is a standard for individual contaminants established by the federal government under the Safe Drinking Water Act, or by individual states. Thus, the feasibility study concluded that the perched-zone contamination did not represent an adverse threat to groundwater quality.

The Central Base Area Operable Unit comprises the Central Base Area TCE groundwater plume and former TCE soil source area (Buildings 658, 673, and 763, and IRP Site 9). The Central Base Area Operable Unit Proposed Plan was released in February 1993, and the Record of Decision for the TCE groundwater plume remedy was signed in 1993. The Air Force has fully implemented the remedies for this area, including the installation and operation of two *groundwater pump and treatment* systems to clean up the TCE groundwater plume and a *soil vapor extraction* system to clean up the soils in the TCE source area. Cleanup of the soils in the TCE source area was completed in 1997. Cleanup of the TCE groundwater plume is ongoing, although the size and concentration of the plume has been reduced significantly.

5. Summary of Site Risks

The Air Force believes that there is no significant risk to human health or the environment from the planned reuse of the sites for industrial purposes. However, in accordance with EPA and DTSC procedures and criteria, the Air Force performed a *risk assessment* during the Basewide Operable Unit Feasibility Study to evaluate risks to human health posed by potential exposure to contaminants. The risk assessment

evaluated the former base property for both commercial/industrial uses for current and future workers and for residential purposes.

Human Health. The Air Force performed a risk evaluation to assess the potential non-cancer and cancer-causing risks from direct exposure to contaminated soils and groundwater. Risks were measured in terms of the probability of an individual developing cancer. The expected cancer risk rate for California is 250,000 cancers in a 1,000,000 population. An increase in this rate of 1 in 1,000,000 is considered a potential risk that needs evaluation. Potential non-cancer effects were evaluated by comparing an exposure level with a toxicological reference dose. This ratio is a level of exposure below which it is unlikely for even sensitive populations to experience adverse health effects.

In the NCP, USEPA indicates that action at a site is generally not warranted if the cumulative cancer risk is less than 1 in 10,000. The excess cancer risk range, 1 in 10,000 to 1 in 10,000,000, is also termed the risk management range. A No Further Action decision can be made if the risk falls within this range if site-specific factors indicate the potential for adverse risk to be minimal or manageable.

Computed cancer risk for the commercial/industrial reuse scenario was within the risk management range for all sites evaluated. Computed cancer risk for the residential reuse



After removing more than 20,000 tons of fuel- and solvent-contaminated soils at Site 1, the site was restored to its original condition as a fairway and green for the golf course. Some residual contamination remains below 20 to 30 feet of clean soil, beyond the range of normal excavation.

scenario was within the risk management range for all sites except IRP Site 7. However, IRP Sites 7, 12, 13, and 19; AOCs 4, 39, and 40; and the Small Arms Range were above the non-cancer target for children for residential reuse.

In summary, the risk assessment results indicate that residual chemicals do not pose adverse health risk to current or future workers at the base. However, if some base properties were converted for residential purposes, the potential exists for adverse risk to human health.

Ecological Risk Assessment. The Air Force also assessed the risks to plants and animals (ecological receptors) at Norton AFB posed by residual soil contamination. The *ecological risk assessment* included an evaluation of plant and animal habitats throughout the base. Several species of special status are present on the base: the burrowing owl (listed by the State of California as a sensitive species), the San Bernardino Merriam's kangaroo rat (federal endangered species), and the Santa Ana River woolly star (federal endangered species). The species are found primarily in undisturbed habitat to the south and east of the airfield runway. The ecological risk assessment concluded that IRP Sites 1, 2, 5, 8, 10, and 13, and contaminants found in the sediments of the unlined golf course ponds posed a potential risk to ecological receptors. However, the ecological risk assessment also concluded that cleanup of the sites to levels established as protective of human health would also be protective to ecological receptors. Cleanup actions have already been implemented at these sites. The Air Force has developed a habitat management plan for the special status species at the former base.

6. Remedial Action Objectives

The *Remedial Action Objectives* for the Basewide Operable Unit are to:

- Eliminate unacceptable risk to human health and the environment by removing contaminated soil.
- Prevent unacceptable risk to human health by preventing residential reuse of the property at some locations.

- Protect the landfill cover and the landfill gas collection and treatment system at IRP Site 2.
- Protect groundwater quality by minimizing or removing the potential for migration of soluble contaminants to groundwater resources.

7. Summary of Cleanup Alternatives

Based on the results of the risk assessment, the Air Force developed several alternatives to address the remaining contamination. These alternatives are summarized below.

Alternative 1: No Action/No Further Action. The Air Force is required to evaluate a no action alternative as the basis for comparing other alternatives and for the assessment of risk reduction or risk acceptability. In addition, because the Air Force has completed many cleanup and removal actions at the base, the no action alternative can also be termed a No Further Action alternative, because no further action may be warranted based on the risk reduction resulting from the prior action. Under CERCLA, monitoring (such as groundwater sampling to evaluate the presence or concentration of groundwater contaminants) is considered no action. Therefore, although a no action alternative can be selected, it may include monitoring.

Alternative 2: Institutional Controls. *Institutional controls* are non-engineering, legal measures intended to limit exposure to hazardous substances by restricting land use or access to the contaminants. Institutional controls can either be government controls, such as zoning rules or deed restrictions. Restrictions, where necessary, would be placed in the deed(s) to prohibit construction, excavation, or other activity that might expose the contamination or damage the integrity of the site. They primarily ensure protection of the remedy. The benefit of deed restrictions is that they are legally binding on all existing and subsequent property owners. As part of the cleanup decisions for the former Norton AFB, where the long-term land use is for commercial and industrial purposes, cleanup to industrial land-use standards would protect all current and future workers.

The Institutional Control alternative would require the Air Force, with assistance from the regulatory agencies, to monitor site conditions over time. To implement the deed restrictions, the Air Force and regulatory agencies would periodically visit the locations to ensure compliance with land-use restrictions. If problems were observed, the Air Force and the regulatory agencies would work with the land owner to correct the situation.

Alternative 3: Containment. The containment alternative involves retention of an existing barrier or the construction of a new barrier to prevent contact with contaminants. In addition, barriers reduce infiltration of rain or irrigation water into the zone where contaminated soils remain. This would protect groundwater resources. The containment barrier could be constructed of engineered soil, concrete, asphalt, or a similar relatively impermeable cover. For example, IRP Site 2 was closed by placing a 5-foot thick soil cover system over the landfill. Containment by covering is a potential option for other soil contamination sites posing a direct contact or groundwater threat risk. Included in the containment alternative is the potential for institutional controls for long-term maintenance of the cover and monitoring of site conditions.

Alternative 4: Removal. The removal alternatives considered for the Basewide Operable Unit are outlined below.

(1) Shallow soil contamination would generally be excavated, loaded into trucks, and hauled to an approved off-base landfill.

(2) Soil vapor extraction is commonly and effectively used to remove volatile chemicals in soil, such as solvents and fuels. The contaminants are removed from the soil using vacuum extraction, and are treated at the surface with carbon filters or destroyed via combustion.

(3) Contaminated perched-zone groundwater could be dewatered through the use of extraction wells, treated on site to remove the contaminants, or trucked off site for treatment at an agency-approved facility.

8. Evaluation of Alternatives

The Air Force evaluated and compared the remedial alternatives against Nine Criteria (see inset). The first two criteria, *overall protection of human health and the environment* and *compliance with state and federal environmental requirements*, are called threshold criteria.

Nine Criteria used to evaluate Alternatives

1. **Overall Protection of Human Health and the Environment.** The degree to which each alternative eliminates, reduces, or controls threats to human health and the environment is assessed. Strategies can include treatment, engineering methods, or institutional controls.
2. **Compliance with State and Federal Environmental Requirements.** The alternatives are evaluated for compliance with environmental protection requirements.
3. **Long-term Effectiveness.** The alternatives are evaluated based on their ability to maintain reliable protection of human health and the environment after implementation.
4. **Reduction of Contaminant Toxicity, Mobility, and Volume.** Each alternative is evaluated based on how it reduces the harmfulness of contaminants and their ability to move through the environment.
5. **Short-term Effectiveness.** The length of time needed to implement each alternative is considered. The risks that a particular alternative may pose to workers and nearby residents are assessed.
6. **Implementability.** The technical feasibility and administrative ease of a remedy, including the availability of goods and services, are considered.
7. **Cost.** The benefits of a particular alternative are weighed against the cost of implementation.
8. **State Acceptance.** The Air Force requests State comments on the Proposed Plan. Then, the Air Force considers whether the State agrees with, has reservations about, or opposes the Preferred Alternative.
9. **Community Acceptance.** The Air Force assesses community acceptance of the Preferred alternative by giving the public an opportunity to comment on the selected process. A public comment period is held. The Air Force considers and responds to community comments before the final decision.

Threshold criteria are requirements that each alternative must meet in order to be eligible for selection. The remaining seven criteria, called modifying and balancing criteria, are used to compare the eligible alternatives and help in the selection of the Preferred Alternative. The table on page 10 presents the preferred alternative for the sites evaluated in the Record of Decision.

The Air Force will evaluate community acceptance of the preferred cleanup alternative after the public meeting and public comment period. The Air Force will describe community acceptance in a section of the Record of Decision, called the Responsiveness Summary.

9. Preferred Alternatives

Based upon the results of the Basewide Feasibility Study, the Air Force, EPA, and DTSC believe that the *preferred alternatives* (selected remedies) presented in this Proposed Plan meet the threshold criteria and provide the best balance among the other alternatives considered with respect to balancing and modifying criteria. The Air Force, EPA, and DTSC believe the preferred alternatives are protective of human health and the environment, will comply with *applicable or relevant and appropriate requirements*, are cost-effective, and utilize permanent solutions to the maximum extent possible. The preferred alternatives are subject to change based upon response to public comments.

This Proposed Plan presents the preferred alternatives for the Basewide Operable Unit sites at the former Norton AFB, including 21 of the 22 IRP sites, 73 of the 73 AOCs, the Small Arms Range, Building 752, and groundwater at the Northeast Base Area. The preferred alternatives are listed in the table on page 13. The *selected remedy* will be established in the Basewide Record of Decision.

10. Community Participation

The Air Force hosts an annual public forum to provide updates on the environmental cleanup status and also provides information to the community through a newsletter, the *Restoration Review*, and fact sheets on special projects or any significant issues.

The public is invited to review and comment on the Basewide Operable Unit Proposed Plan. The comment period will begin on 28 July 2004 and end on 27 August 2004. Written comments should be sent to Mr. Phil Mook (see address in the box on page 1). A public meeting will be held 11 August 2004, and representatives from the Air Force will be present to answer questions about the former Norton AFB and the remedial alternatives under consideration. Public comments can be submitted either in writing or orally at the public meeting. Written comments must be postmarked no later than 27 August 2004 for consideration and official response. The public may use the form attached to this document to submit written comments. Written comments sent by mail and oral comments presented at the public meeting will be equally considered.

The Air Force will prepare written responses to all substantive comments pertaining to this Basewide Operable Unit Proposed Plan. Responses to the public comments will be included in the *Responsiveness Summary* of the Basewide Operable Unit Record of Decision. The Record of Decision will be available in the Administrative Record upon publication. The Administrative Record may be viewed at the Norman Feldheim Central Library at 555 West Sixth Street, San Bernardino, California.

Preferred alternatives presented in this Proposed Plan may be modified or other alternatives may be selected based upon public comments. Final remedies will not be selected until the public comment period has ended and all comments have been responded to appropriately.

Description of Sites and Areas of Concern Evaluated in the Record of Decision

Site Name	Site Description and Former Use	Site Activities and Status	Preferred Alternative (Selected Remedy)	Rationale for Selected Remedy
IRP Site 1	Industrial Waste Lagoons. Liquid industrial waste was reportedly disposed in unlined lagoons from about 1950-1960. In approximately 1960, the lagoons were backfilled and became part of the golf course.	Approximately 20,900 tons of contaminated soil (fuels and solvents) were removed and disposed off base in 1998.	Alternative 1 NFA	The selected remedy allows unrestricted use of the property.
IRP Site 2	Landfill No. 2. Disposal site for general refuse, construction debris, rubble, and industrial waste from about 1958-1980.	Landfill waste is covered by an engineered monolithic soil cap that prevents human and ecologic contact with contaminants within the landfill. The cap also prevents the release of contaminants from the landfill and protects the groundwater by preventing rainwater from entering the landfill. The landfill gas collection/ destruction system removes organic gases produced during decomposition of the buried refuse.	Alternative 2 ICs: deed restriction <ul style="list-style-type: none"> • No residential use • No activities that would disturb soil except landfill gas and groundwater monitoring • No contact with landfill waste • No removal of fencing or signs • No activities that would disturb surface or water drainage • No limitation of access to landfill gas equipment and system for site inspections 	Prevents exposure to landfill waste and protects the landfill cover and gas collection system.
IRP Site 5	Fire Protection Training Area No. 2. Location of fire control and abatement training exercises from the 1950s to the 1970s. Waste fuels, waste oils, spent solvents, and jet fuels were used during exercises.	Approximately 20,000 pounds of fuel/solvent contaminants were removed using soil vapor extraction. Approximately 30,000 tons of soil contaminated with metals and dioxins were excavated, stabilized and disposed both on and off site in 1996 to 1998. However, residual soil contamination (lead) exceeds residential reuse levels.	Alternative 2 ICs: deed restriction <ul style="list-style-type: none"> • No residential use • No limitation of access for site inspections • No activities that would disturb soil below 3 feet 	Prevents exposure to contaminated soil.
IRP Site 7	IWTP Sludge Drying Beds. Twelve unlined drying beds covering approximately 17,280 square feet were used until 1987. Sludge was removed.	Soil contamination (metals, PCBs, PAHs) exceeds residential reuse levels.	Alternative 4 Removal: Excavation and off-site disposal	Remove concrete drying beds and contaminated soil to allow unrestricted use of the property.
IRP Site 10	Landfill No. 1. Disposal and burning of general refuse from 1943 to 1958.	Soil contamination (metals, dioxins) exceeds residential reuse levels. The area of contamination includes habitat for two endangered species (the kangaroo rat and the woolly star).	Alternative 4 Removal: Excavation and off-site disposal	Remove dioxin-contaminated soil to allow unrestricted use of the property.

Description of Sites and Areas of Concern Evaluated in the Record of Decision

Site Name	Site Description and Former Use	Site Activities and Status	Preferred Alternative (Selected Remedy)	Rationale for Selected Remedy
IRP Site 12	Waste Pit No. 3. Disposal site for chemical and other miscellaneous waste, reportedly in use in 1958.	Soil contamination (metals, dioxins) exceeds residential reuse levels.	Alternative 4 Removal: Excavation and off-site disposal	Remove metal-contaminated soil to allow unrestricted use of the property.
IRP Site 17	Drummed Waste Storage Area/Waste Fuel and Solvent Sump. Two waste fuel and solvent sumps were used as a holding tank and oil/water separator until 1985. Drummed materials containing plating and solvent wastes were stored near the sumps.	Soil contamination (solvents) exceeds residential reuse levels.	Alternative 4 Removal: Excavation and off-site disposal	Remove concrete sumps and contaminated soil to allow unrestricted use of the property.
IRP Site 19	Drum Storage Area No. 1. Storage area for drums containing waste fuels, oils, plating solutions, TCE and trichloroethane sludges, PCBs, and cyanide waste.	Soil contamination (PCBs) exceeds residential reuse levels. However, it is covered by approximately 20 inches of concrete that protects humans from contact prevents the contamination from migrating or spreading out in the soil.	Alternative 2 ICs: deed restrictions <ul style="list-style-type: none"> • No residential use • No limitation of access for site inspection • No activities that would disturb the concrete cover 	Prevents exposure to contaminated soil and protects the concrete cover.
AOC 4	Building 301 – solids collection pit and trench drains	Soil contamination (metals) exceeds residential reuse levels. (The property is restricted to industrial use as it is part of the airfield. If the property were no longer used as an airfield, it would have to be returned to the federal government and reevaluated.)	Alternative 1 NFA	As part of the airfield, the site does not pose a risk to human health or the environment.
AOC 18	Buildings 451 and 452 – underground storage tank site and former garage/gas station	Fuel related soil contamination below 10 to 15 feet was detected at levels exceeding residential use. However, the contaminants are volatile and degradable and are expected to decrease with time.	Alternative 1 NFA	The selected remedy allows unrestricted use of the property.
AOC 33	Building 747 – industrial facility/engine overhaul facility	Soil contamination (fuels) exceeds residential reuse levels.	Alternative 4 Removal: Excavation and off-site disposal	Remove concrete sump and contaminated soil to allow unrestricted use of the property.
AOC 39	Golf Course Storm Drain Outfall Area	Although soil contamination (PAHs, PCBs) was detected above residential reuse levels, the PAH are expected to degrade with time, and metals are only slightly above background.	Alternative 1 NFA	The selected remedy allows unrestricted use of the property.

Description of Sites and Areas of Concern Evaluated in the Record of Decision

Site Name	Site Description and Former Use	Site Activities and Status	Preferred Alternative (Selected Remedy)	Rationale for Selected Remedy
AOC 40	Golf Course Maintenance Area	Soil contamination (metals, chlordane, PCBs) exceeds residential reuse levels.	Alternative 4 Removal: Excavation and off-site disposal	The selected remedy will remove surface soil along with structures and debris and allow unrestricted use of the property.
AOC 70	Former IWTP Effluent Percolation Pond	Soil contamination (PCBs, pesticides, metals, and PAHs) was removed in 1997. Although residual soil contamination was detected above residential reuse levels, the small size of the site (0.1 acre) and the fact that the contamination is 3 to 10 feet below the surface provide protection.	Alternative 1 NFA	The selected remedy allows unrestricted use of the property.
Small Arms Range	The range was used for small arms target practice.	Contaminated soil was excavated and disposed off site. Some of the impact berm was pushed into the IRP Site 5 excavation and covered with clean soil. Residual soil contamination (lead) exceeds residential reuse levels.	Alternative 2 ICs: deed restriction <ul style="list-style-type: none"> • No residential use • No limitation on access for site inspection 	Prevents exposure to contaminated soil.
Building 752	Radionuclides Building Exterior. During the 1950s, aircraft dials were painted using a luminescent paint containing Radium-226, a radioactive element. Paint waste was washed inside the building into a sink connected to the sanitary sewer. Investigations of the sewer line exiting the building to the main sewer line showed that the pipeline and adjacent soils were contaminated by Radium-226.	The pipeline and adjacent soils were subject to a removal action. Confirmation sampling of soil following removal showed a few spots where radium-226 was at concentrations above background. Based on this finding, the need for further removal action for radium-226 was identified. Also, during evaluation of the building, it was determined that wash water containing residual radium had affected an area to the west of the building, which also requires removal.	Alternative 4 Removal: Excavation and off-site disposal	Remove contaminated soil to allow unrestricted use of the property.

- AOC = Area of Concern
- IC = Institutional Control
- IRP = Installation Restoration Program
- NFA = No Further Action
- IWTP = Industrial Waste Treatment Plant
- MCL = Maximum Contaminant Level
- PAH = petroleum aromatic hydrocarbon
- PCB = polychlorinated biphenyl
- PCE = tetrachloroethylene

Sites and Areas of Concern Identified for No Further Action

The following sites were identified for No Further Action during the investigation phase of study at Norton AFB. These studies included the remedial investigation, the basewide confirmation study and addendums, and the expanded source investigation and addendum. Sites listed exhibited no soil contamination at levels that exceeded unrestricted land use goals, i.e., no contamination above screening or background levels.

No release of contamination = no contamination was detected.

Contamination removed = contamination was removed to below screening or background levels.

No contamination exists = contamination was below screening or background levels.

Site Name/Description	Basis for No Further Action
IRP Site 3 – Waste Pit No. 2	No release of contamination
IRP Site 4 – Waste Pit No. 1	No release of contamination
IRP Site 6 – Underground Waste Oil Tank	Contamination removed
IRP Site 8 – Polychlorinated Biphenyl Spill Area	Contamination removed
IRP Site 11 – Fuel Sludge Drying Beds	No contamination exists
IRP Site 13 – Industrial Waste Treatment Plant Sludge Disposal Area	Contamination removed
IRP Site 14 – Waste Pit No. 4	Contamination removed
IRP Site 15 – S-290 Tank (service station underground storage tank)	No contamination exists
IRP Site 16 – Air Combat Camera Services Evaporation Basins	Contamination removed
IRP Site 18 – Aviation Gas Spill Areas	No contamination exists
IRP Site 20 – Low-Level Radioactive Waste Burial Site (alleged disposal site in 1960s)	No contamination exists
IRP Site 21 – Air Combat Camera Services Underground Ferricyanide Tank	No contamination exists
IRP Site 22 – Industrial Waste Treatment Plant Discharge Ditch and Outfall Area	No contamination exists
AOC 1 – Building 248 Air Combat Camera Services (dry well area)	No contamination exists
AOC 2 – Building 258 (floor drains and sump)	No contamination exists
AOC 3 – Building 295 (automotive maintenance facility)	No contamination exists
AOC 5 – Building 302 (aircraft maintenance facility)	No contamination released
AOC 6 – Buildings 313, 317, and 320 (automotive repair facility)	No contamination exists
AOC 7 – Building 330 (automobile body and paint shop)	No contamination exists
AOC 8 – Building 337 (aircraft, vehicle, and equipment wash rack)	No contamination exists
AOC 9 – Buildings 333 and 341 (aircraft and vehicle maintenance facility)	No contamination exists
AOC 10 – Building 336 (sand and grease traps)	No contamination exists
AOC 11 – Building 338 (battery acid disposal area)	No contamination exists
AOC 12 – Building 344 (dry cleaning and laundry facility)	No contamination exists
AOC 13 – Building 345 (civilian washing facility)	No contamination exists
AOC 14 – Buildings 405 and 408 (underground gasoline storage tank area)	No release of contamination
AOC 15 – Building 432 (automotive maintenance facility)	No contamination exists
AOC 16 – Building 435 (engine test facility and automobile maintenance)	No release of contamination
AOC 17 – Buildings 441 and 442 (vehicle and equipment wash racks)	No release of contamination
AOC 19 – Buildings 576 and 578 (automotive repair shop and wash rack)	No contamination exists
AOC 20 – Building 635 (chemical and salvage storage)	No contamination exists
AOC 21 – Building 638 (radio repair/electronics/armament shop)	No release of contamination
AOC 22 – Building 653 (underground storage tank and fueling system)	No contamination exists
AOC 23 – Building 655 (aircraft reclamation facility and repair shop)	No contamination exists
AOC 24 – Building 658 (equipment and engineering maintenance)	Contamination removed
AOC 25 – Building 678 (armament repair facility)	No contamination exists
AOC 26 – Building 695 (aircraft fuels maintenance hangar)	No release of contamination
AOC 27 – Building 705 (engine processing facility)	No release of contamination
AOC 28 – Building 707 (rubber reclamation and repair facility)	No contamination exists
AOC 29 – Buildings 723, 724, and 725 (underground storage tanks)	No contamination exists
AOC 30 – Building 726 (engine test facility)	No contamination exists
AOC 31 – Building 736 (hazardous test facility, battery acid sump)	No contamination exists
AOC 32 – Building 741 (dry cleaning plant and electronics overhaul facility)	No release of contamination
AOC 34 – Building 749 (maintenance facility)	No contamination exists

Site Name/Description	Basis for No Further Action
AOC 35 – Building 755 (blacksmith and foundry)	No contamination exists
AOC 36 – Building 795 (aircraft maintenance hangar)	No contamination exists
AOC 37 – Refuse Dump Area	Contamination removed
AOC 38 – C Street Storm Drain Outfall	Contamination removed
AOC 41 – Lockheed Soil Excavation Treatment Cell	No release of contamination
AOC 42 – Building 514 (chemical storage area)	No contamination exists
AOC 43 – Building 763 Dock, Buried Sumps	No contamination exists
AOC 44 – Eastern Golf Course Ash Layer	No contamination exists
AOC 45 – 500 Series Buildings	No contamination exists
AOC 46 – 900 Series Buildings	No contamination exists
AOC 47 – Detachment 10, Ballistic Missile Organization (debris site)	No release of contamination
AOC 48 – Former Communication Facility	No release of contamination
AOC 49 – Building 248 Satellite Waste Accumulation Point	No release of contamination
AOC 50 – Building 329 Satellite Waste Accumulation Point	No contamination exists
AOC 51 – Building 333 Satellite Waste Accumulation Point	No contamination exists
AOC 52 – Building 341 Satellite Waste Accumulation Point	No contamination exists
AOC 53 – Building 403 Satellite Waste Accumulation Point	No release of contamination
AOC 54 – Building 407 Satellite Waste Accumulation Point	No release of contamination
AOC 55 – Building 412 Satellite Waste Accumulation Point	No contamination exists
AOC 56 – Building 417 Satellite Waste Accumulation Point	No contamination exists
AOC 57 – Building 427 Satellite Waste Accumulation Point	No release of contamination
AOC 58 – Building 468 Satellite Waste Accumulation Point	No contamination exists
AOC 59 – Building 620 Satellite Waste Accumulation Point	No contamination exists
AOC 60 – Building 675 Satellite Waste Accumulation Point	No contamination exists
AOC 61 – Building 680 Satellite Waste Accumulation Point	No contamination exists
AOC 62 – Building 825 Satellite Waste Accumulation Point	No contamination exists
AOC 63 – Building 950 Satellite Waste Accumulation Point	No contamination exists
AOC 64 – Building 976 Satellite Waste Accumulation Point	No contamination exists
AOC 65 – Delta 7 Satellite Waste Accumulation Point	No contamination exists
AOC 66 – Gate 10 Satellite Waste Accumulation Point	No contamination exists
AOC 67 – Building 763 Gasoline Dump Pits	No contamination exists
AOC 68 – Building 620 Wash Pad	No contamination exists
AOC 69 – Chemical Warfare Training Area	No contamination exists
AOC 71 – Building 763 IRP Site 9 Air Ducts	Contamination removed
AOC 72 – Former Park and Wash Area for Aircraft Fueling Vehicles	No release of contamination
AOC 73 – Explosive Ordnance Proficiency Training Range	Contamination removed
NBA Plume - Northeast Base Area PCE (volatile organic compound) Plume	No contamination exists

Definition of Key Terms

Administrative Record: A collection of information used by the Air Force to make decisions regarding response actions under CERCLA. This record is available for public review.

Applicable or Relevant and Appropriate

Requirements: The set of federal and state laws and regulations that govern remedial actions and associated activities. Selected remedies must comply with ARARs, although some ARARs may be waived in certain instances.

Areas of Concern (AOCs): A location with a history of chemical usage, but with no record of chemical disposal or contamination. The AOCs were subject to a records search, confirmation study sampling for chemicals used at the location, and an expanded source investigation if chemicals were detected in the initial soil or soil gas samples.

California Department of Toxic Substances Control (DTSC): The agency responsible for implementing California laws and regulations pertaining to remediation of hazardous waste sites.

California Regional Water Quality Control Board (RWQCB): Agency responsible for protecting the waters of the State of California.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA): Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA) that governs the investigation and cleanup of certain hazardous waste sites and includes requirements for community involvement.

Ecological Risk Assessment: An evaluation of risks to habitat and biological receptors (plants and animals) posed by potential exposure to contaminants.

Feasibility Study: An evaluation of engineering and institutional measures for reducing the chemical risks at a site. Alternatives for reducing risk due to potential exposure to the contaminants are considered and compared to Nine Criteria (see page 7). The feasibility study forms the basis for identifying and selecting the preferred remedial alternative.

Groundwater Pump and Treat: A remedial method consisting of the extraction of contaminated groundwater from subsurface wells. At Norton, the groundwater was treated by pumping the contaminated water to an air stripper to remove TCE. The TCE was trapped in activated carbon and removed. Clean water was returned to the groundwater.

Installation Restoration Program (IRP): The environmental investigation and cleanup process implemented at Air Force bases. The IRP process parallels EPA guidance for investigation and cleanup of industrial sites.

Institutional Controls: Legal or administrative controls or restrictions used to eliminate or reduce exposure to contaminants and protect operation of cleanup remedies.

National Oil and Hazardous Substances Contingency Plan (NCP): The federal regulation that guides determination of the sites to be corrected under the CERCLA program.

National Priorities List: A nationwide list of priority hazardous substance sites identified under the National Oil and Hazardous Substances Contingency Plan.

No Further Action: A determination that a site does not pose a significant risk to human health and the environment and thus does not require any further remedial action.

Operable Unit: Sites with similar contaminants and conditions that are grouped together for investigation, evaluation, and remedial action.

Preferred Alternative: The remedial action recommended by the lead agency. The preferred alternative is developed during the remedial investigation/feasibility study process and is presented in the proposed plan.

Proposed Plan: The document prepared for public review and comment that describes preferred remedial alternatives.

Record of Decision: The legal document describing and formalizing the selected remedy. For Norton AFB, Records of Decision are reviewed and signed by the Air Force, USEPA, and the State of California. The Record of Decision includes responses to public comments on the Proposed Plan.

Remedial Action Objectives: Cleanup goals or limits determined to be protective of human health and the environment.

Remedial Investigation: A remedial investigation or expanded source investigation follows the records search and site inspection when these preliminary investigations indicate the presence of environmental contamination. The remedial investigation is a more extensive sampling program involving collection of numerous soil, air, and/or groundwater samples to define the nature (the types of chemicals concentrations) and extent (area and volume) of contamination. During the remedial

investigation a risk assessment is performed to evaluate the potential health threats due to exposure to soil, air, and water.

Removal Action: A short-term action implemented to clean up a site that poses an immediate threat to human health or the environment.

Responsiveness Summary: A summary of oral or written comments received during a public comment period and lead agency responses to the comments.

Risk Assessment: An evaluation of risks to human health due to potential exposure to contaminants.

Selected Remedy: The action selected by the lead agency to protect human health and the environment at a site.

Soil Vapor Extraction: A remedial technology whereby volatile contaminants are removed from soil using vacuum applied to subsurface wells. The extracted vapors are treated using carbon filters or are destroyed via combustion.

Trichloroethene (TCE): A volatile solvent used in industrial applications and dry cleaning.

U.S. Environmental Protection Agency (EPA): The agency responsible for implementing federal environmental laws and regulations pertaining to remediation of hazardous waste sites and other environmental risks.

Information Repository

The Air Force maintains a website with documents related to the environmental cleanup of former Norton Air Force Base, which may be accessed at the public library:

Norman Feldheim Central Library
California Room
555 West Sixth St.
San Bernardino, CA 92410

The Air Force encourages you to use this information resource during your review of this Proposed Plan, which will facilitate your participation in the decision process regarding the Basewide Operable Unit Proposed Plan.

FOR MORE INFORMATION

For more information about the public involvement process or if you have questions or comments about environmental activities at Norton AFB, please contact:

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