



Naval Air Facility

El Centro, CA.

*Environmental
Restoration Program
1999*

NAF El Centro Commanding Officer

NAF El Centro



COMMANDING OFFICER
NAVAL AIR FACILITY EL CENTRO
1605 THIRD STREET
EL CENTRO, CA 92243-5001

A note from the Commanding Officer:

Naval Air Facility (NAF) El Centro's ability to accomplish its mission requires daily operation in the land, air and over the Colorado River waters that contribute to the Imperial Valley agricultural community.

The Installation Restoration Program is one of several environmental disciplines that compliment our mission. The Navy developed the Installation Restoration Program in the mid-1980s. The Program identifies and investigates potentially hazardous disposal sites and contaminated areas caused by past hazardous substance storage, handling, or disposal practices.

I'm extremely proud of our accomplishments at the seventeen Installation Restoration Program sites identified at NAF El Centro. Based on the investigations conducted, environmental regulatory agencies agreed that six of these sites do not pose a threat to human health or the environment. In the mean time, cleanup is complete at six other sites. The remaining five Installation Restoration Program sites will be cleaned up in the near future.

NAF El Centro is committed to accomplishing its mission in a manner compatible with the environment. As a result, we maintain an open dialogue with California Environmental Protection Agency (EPA), Department of Toxic Substances Control, California EPA Regional Water Quality Control Board Colorado River Basin Region 7 and local environmental agencies. NAF El Centro personnel, tenant commands and contractors develop and exhibit an environmental protection ethic.

I extend my sincere appreciation to the community of Imperial Valley and everyone involved for their commitment, teamwork and efforts in protecting and cleaning up the environment. I look forward to continuing our mission in concert with the environment. Thanks for a job well done!

Sincerely,

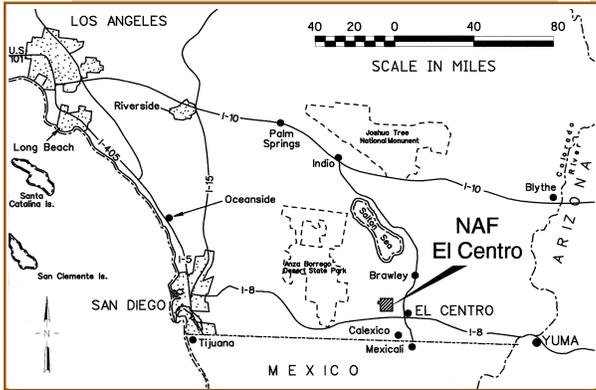

Carlos S. Badger

NAF El Centro Location & History

Naval Air Facility El Centro is located in the southeastern corner of California in Imperial County. The base lies approximately seven miles northwest of the city of El Centro, 11 miles north of the U.S./Mexico border.

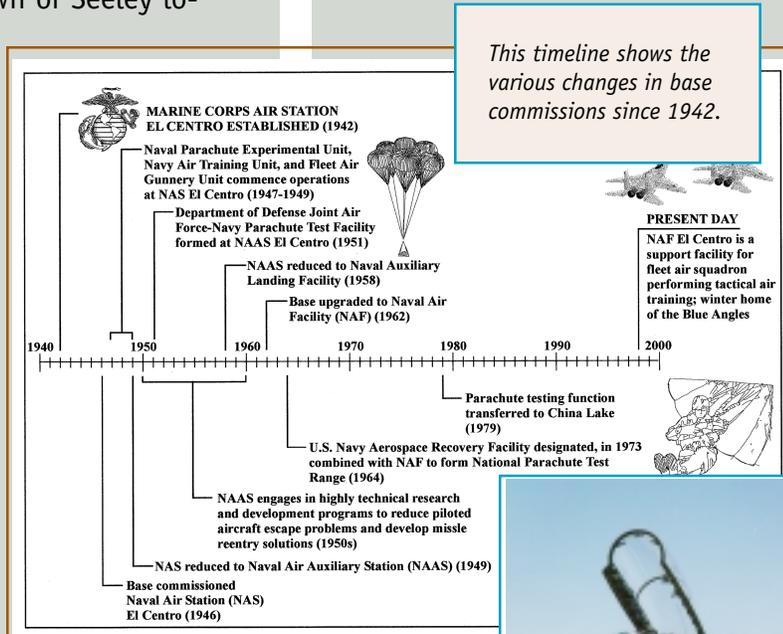
Naval Air Facility El Centro's main tenant command is the Strike Fighter Maintenance Unit. This unit provides maintenance and training support to fleet replacement squadrons from both the East and West Coast. NAF El Centro also is the winter home of the Blue Angels U.S. Navy Flight Demonstration Squadron.

These activities resulted in contamination of soil and groundwater at the base. NAF El Centro's environmental mission is to clean up, remove, or remediate all hazardous waste sites to an acceptable risk level consistent with the mission and continued operation of the base.



The closest residential community is the town of Seeley located one mile south of the base.

NAF El Centro is the Navy's support facility for fleet air squadrons performing tactical air training such as field carrier landing practice, air-to-ground weapons training, and fleet fighter air combat maneuvers.



This timeline shows the various changes in base commissions since 1942.



Tenant Commands at NAF El Centro include the Strike Fighter Maintenance Unit and the Blue Angels.

Environmental Cleanup Program

Purpose:

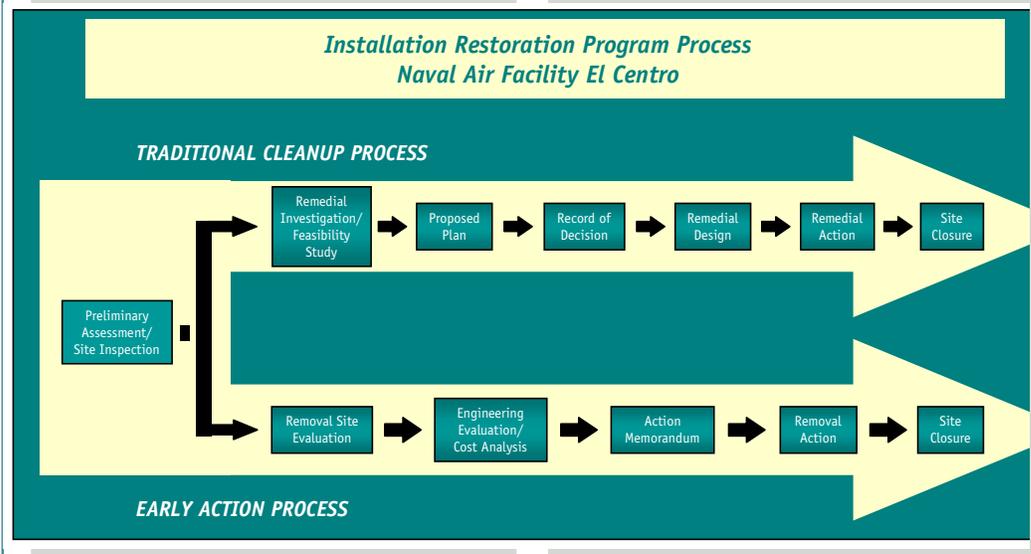
The environmental cleanup program for the Department of the Navy is known as the Installation Restoration (IR) Program. The purpose of the IR Program is to identify, assess, characterize, and clean up or control contamination caused by past hazardous waste disposal practices and hazardous material spills at Navy and Marine Corps facilities.

Background:

Due to the nature and extent of its operations, the Navy has been involved with toxic and hazardous materials for several decades. These materials, if released to the environment, can lead to significant damage to important natural resources upon which humans and nature depend.

The Navy has been actively involved in the IR Program since 1980 and has taken an aggressive, proactive approach to cleaning up its hazardous waste sites. Seventeen such sites have been identified at NAF EL Centro impacting both soil and groundwater. The types of contaminants being addressed under NAF EL Centro's IR Program include:

- *petroleum hydrocarbons (namely jet fuel)*
- *metals*
- *solvents*
- *polychlorinated biphenyls (PCBs)*
- *pesticides*





NAF El Centro Public Works Department, Environmental Division

Manages various environmental programs including the IR Program and is responsible for complying with federal, state, and local regulations.

Southwest Division Naval Facilities Engineering Command

Provides contract management, funding, and oversight assistance for environmental investigations and cleanup pertaining to past disposal of hazardous wastes. Manages the contractors that are providing investigation and cleanup services.

Investigation Contractors

Provide environmental investigation and engineering expertise for evaluating the nature and extent of contamination at IR Program sites. Provide design, technical review of, and recommendations for cleanup alternatives. The Comprehensive Long-term Environmental Action Navy (CLEAN) contractor for NAF El Centro is Bechtel National, Inc. Fixed price contractors are also used when feasible.

California Environmental Protection Agency Department of Toxic Substances Control

Provides technical oversight of investigation and cleanup of IR Program sites at NAF El Centro.

California Environmental Protection Agency Regional Water Quality Control Board, Colorado River Basin Region 7

Provides technical oversight of investigation and cleanup of IR Program sites with water quality issues at NAF El Centro.

Imperial County Planning and Building Department, Underground Storage Tank Program

Provides technical oversight of underground storage tank sites including those being considered under the IR Program.

Local Community

Members of the local communities surrounding NAF El Centro are invited to participate in the IR Program at regular milestones throughout the cleanup process. Public input is sought on documents such as investigation reports and cleanup work plans.

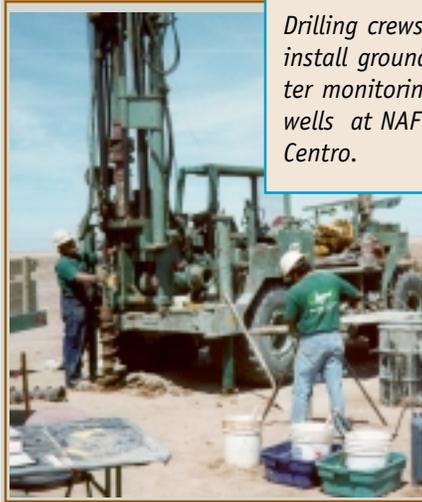
Cleanup Contractors

Provide engineering construction services to clean up and/or control contamination at IR Program sites at NAF El Centro. The Remedial Action Contractors for NAF El Centro is OHM Remediation Services/IT Corporation. Fixed price contractors are also used when feasible.

Environmental Cleanup Team

Environmental Site Characterization

Site characterization is a process used to determine the nature and extent of contamination at a site. The results from the site characterization process are used to evaluate whether a site poses unacceptable risk to human health and/or the environment. Site characterization typically includes:



Drilling crews install groundwater monitoring wells at NAF El Centro.

- collection of soil, sediment, surface water, and/or groundwater samples
- laboratory analysis of samples
- evaluation and reporting of analytical results.

The comprehensive report presenting the results of site characterization is reviewed thoroughly by a designated Cleanup Team, which includes regulatory agency representatives. Appropriate cleanup alternatives are identified when necessary.

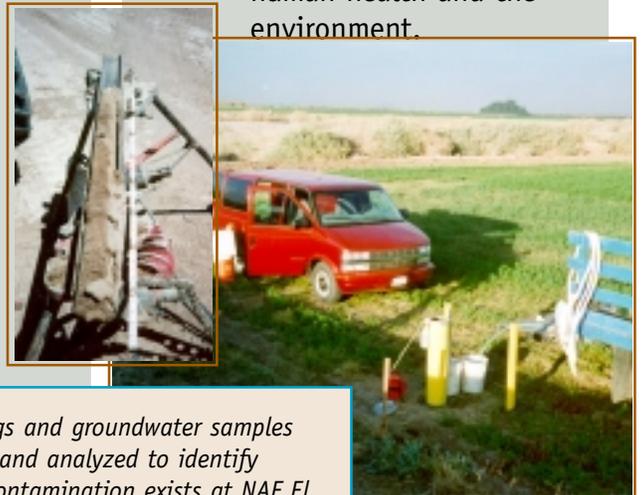
Soil borings and groundwater samples are taken and analyzed to identify whether contamination exists at NAF El

Strict procedures are adhered to during the collection of samples in the field and sample analysis in the laboratory. Laboratory methods used to analyze samples are sensitive enough to detect extremely minute levels of chemicals. As a result, all equipment used to collect samples must be carefully cleaned between sampling.

An evaluation of data collected is conducted to:

- assess vertical and lateral extent of contamination
- identify areas with the highest levels of contamination
- assess potential threat to human health and/or the environment.

Cleanup is required when analyses identify contamination to soil, sediment, and/or groundwater at levels that present unacceptable risk to human health and the environment.



Environmental Site Characterization

About the Area - NAF El

Centro is located in the Colorado Desert region of Southern California at an elevation of about 45 feet below mean sea level. Summer and winter temperatures range from 55 to 115 degrees Fahrenheit. Since the early 1900s, the primary industry in Imperial Valley has been agriculture. The agricultural activities have removed most of the native habitat in the vicinity of the base. With the exception of the banks and tributaries along the New River, all of the original native vegetation has been removed. Vegetation in some areas has been allowed to regrow with a combination of native and nonnative plants.

About the Wildlife - Many species of wildlife inhabit the area surrounding NAF El Centro. The following six species of special concern have been identified in the area.

- *burrowing owl*
- *flat-tailed horned lizard*
- *Colorado valley woodrat*
- *Yuma clapper rail*
- *willow flycatcher*
- *bank swallow*

Habitats of these and other wildlife must be considered during site characterization. It is an important and sometimes difficult task to minimize impacts resulting from contamination as well as from the investigation and cleanup.



Burrowing owls and other wildlife live near NAF El Centro. Considerable care is taken to protect sensitive natural resources during IR Program

About the Environment -

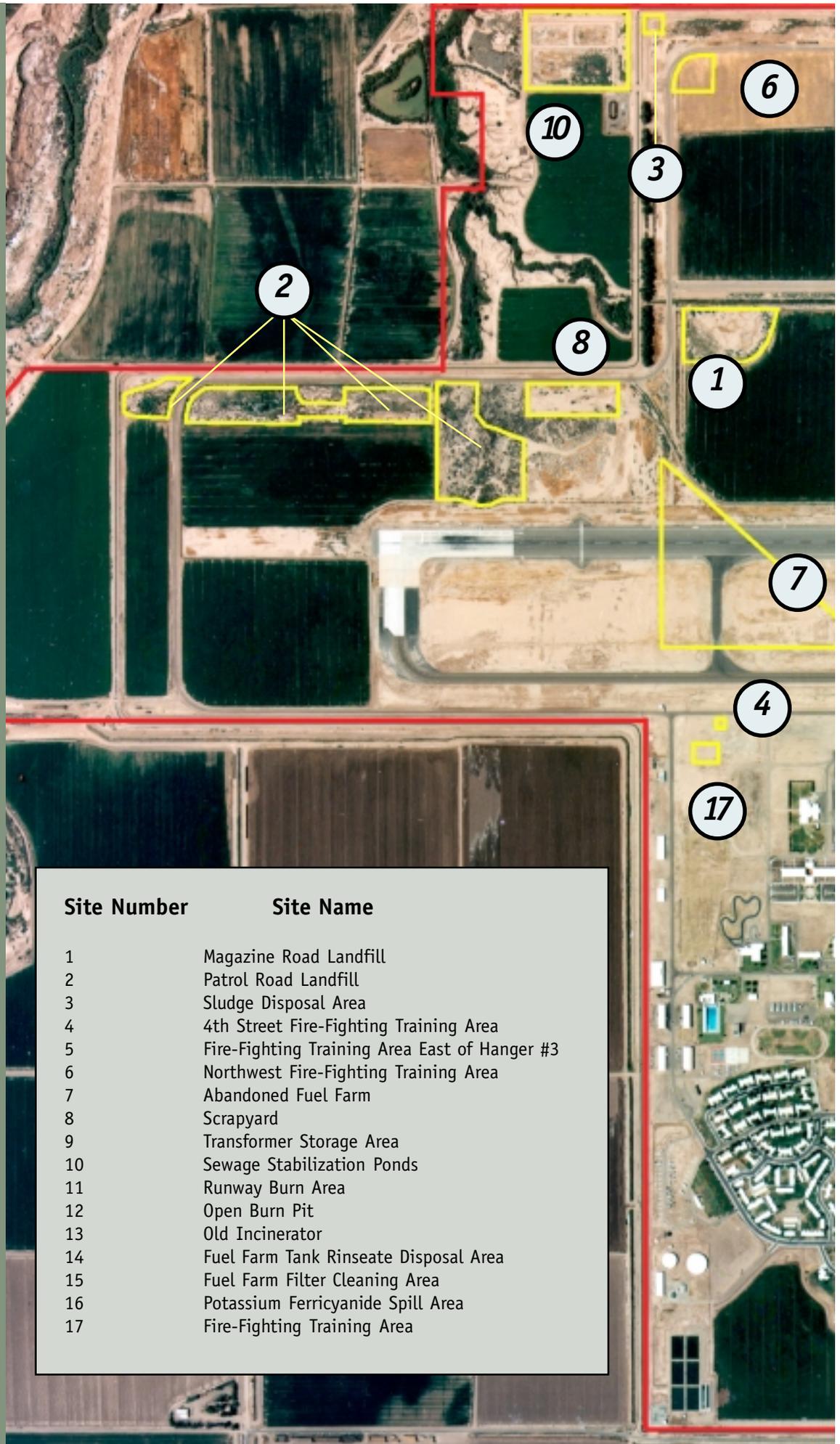
Soils, surface waters, groundwater, and other ecological factors at NAF El Centro were carefully considered during site characterization. Investigations focused on the shallow groundwater system within the *Lake Cahuilla* geologic deposits located 100 to 300 feet below the ground surface. These deposits are fairly impermeable silt and clay layers that isolate the shallow groundwater from a deeper aquifer. Groundwater under NAF El Centro exists at about 12 feet below the ground surface and flows to the northwest, toward the New River. Groundwater quality in the shallow aquifer is generally poor due to high salt concentrations. According to Cal-EPA's Regional Water Quality Control Board, Region 7, groundwater is not considered useable for domestic or agricultural purposes.



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NAF El Centro

Environmental Site Map



Site Number	Site Name
1	Magazine Road Landfill
2	Patrol Road Landfill
3	Sludge Disposal Area
4	4th Street Fire-Fighting Training Area
5	Fire-Fighting Training Area East of Hanger #3
6	Northwest Fire-Fighting Training Area
7	Abandoned Fuel Farm
8	Scrapyard
9	Transformer Storage Area
10	Sewage Stabilization Ponds
11	Runway Burn Area
12	Open Burn Pit
13	Old Incinerator
14	Fuel Farm Tank Rinseate Disposal Area
15	Fuel Farm Filter Cleaning Area
16	Potassium Ferricyanide Spill Area
17	Fire-Fighting Training Area



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Environmental Site Map

Environmental Site Cleanup

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NAF El Centro

NAF El Centro demonstrated a *total team* approach, as represented at Site 14/15, the Fuel Farm Rinsate Disposal Area and Fuel Farm Filter Cleaning Area that was successfully cleaned up in one year. The site

Remediation at Site 14/15 saved the Navy \$5 million.



was found to have seven acres of contaminated soil and groundwater, three of which were saturated with up to five feet of free product (jet fuel). The original plan was to extract free product from the groundwater, and excavate contaminated soil and transport it to a treatment facility. CLEAN and the Remedial Action Contractor conducted a joint pilot study to evaluate an innovative *in-situ* technology to address soil and groundwater simultaneously. During 1995 and 1996, multi-phase extraction with pneumatic soil fracturing in clay soils was applied to reduce contamination at a test area of Site 14/15. The CLEAN/RAC team designed, built, and operated the system that was later applied across the site. An estimated 40,000 gallons of petroleum hydrocarbons were removed, and the original estimated to clean up the site was reduced by \$5 million.

Successful negotiations with regulators are expected to save the Navy up to \$7 million in remediation costs at Site 7, the Abandoned Fuel Farm. Originally planned for large-scale cleanup, Site 7 was identified as a candidate for *bio-attenuation*, a newly accepted method for remediating fuel-contaminated sites.

Site 7 was the location of 21 underground tanks that leaked fuel into the soil and groundwater. Contamination at Site 7 encompassed 40 acres with most concentrations at levels below those requiring cleanup. Native biological activity needed to support bio-attenuation was found to be present in soil. A pump-and-treat approach will likely be used to address groundwater contamination at about 10 acres of the site with the highest contamination. Once these groundwater *hot spots* have been reduced, concurrence on implementing bio-attenuation at the

remaining 30 acres is expected to be received

Environmental sampling was conducted safely while mission-essential activities were con-



Environmental Site Cleanup

The Removal Actions conducted at IR Program sites 1, 3, and 8 illustrate creative thinking and the importance of NAF El Centro environmental staff and contractors teaming



with regulators to reach common goals. Site 1, the Magazine Road Landfill, required a protective soil cap to reduce health threats to humans and the environment. Site 3, the Sludge Disposal Area, and Site 8, the Scrapyard, required disposing of soils found to have metals, pesticides, and PCBs contamination. It was proposed to use inert (non-contaminated) soils excavated from sites 3 and 8 to cover the Site 1 landfill. The NAF El Centro Cleanup Team, which includes regulatory agency representatives, made the commitment to work together to find feasible and cost-effective alternatives to site cleanup. The results of this commitment came in the form of the following:

- a decision flow evaluation process for identifying inert soils at sites 3 and 8
- an alternative to the more traditional multi-layer landfill cap design, consisting of a single layer of natural soil more suitable to the local desert climate.

Due to the focused effort of the Cleanup Team, Site 1 was ultimately capped with inert soil from sites 3 and 8, as well as treated and stockpiled soil from previous cleanup projects onboard NAF El Centro. Only contaminated soil was taken to a



A geosynthetic clay liner is installed to protect the environment at the Site 1 Magazine Road Landfill.

permitted treatment facility. The use of inert soils from on-base sources reduced the original cost by over \$1 million in soil import and disposal costs while fulfilling local, state, and federal environmental laws.



Compacting soil to complete landfill cap installation at Site 1.

Environmental Site Status & Schedule

Significant progress has been made to investigate, clean up, and close the 17 IR Program sites at NAF El Centro. Six sites were recommended for and received regulatory concurrence

This commitment includes maintaining compliance with applicable state and federal laws designed to protect human health and the environment. This streamlined process includes:

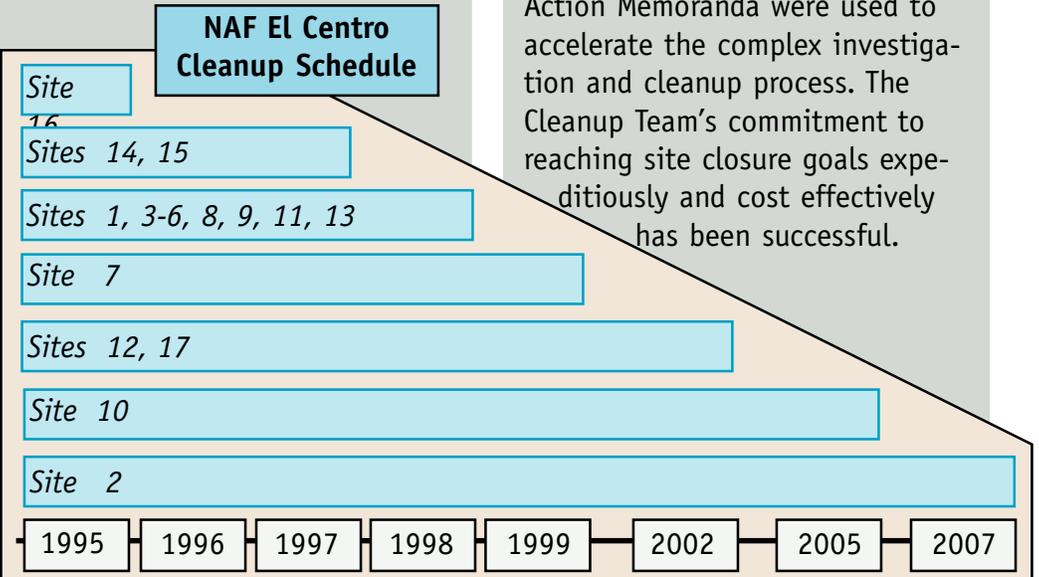
Site Status	Existing IR Sites	Investigation Underway or Complete	Sites closed through investigation	Sites closed through cleanup	Sites remaining for cleanup
Number of Sites	17	17	6	6	5

for no further action without undergoing cleanup. Of eleven sites recommended for further action, six have been cleaned up and three have since received regulatory concurrence on no further action. Five remaining sites are scheduled for future cleanup. Groundwater monitoring continues at six sites.

- prioritizing cleanup alternatives
- conducting remedial actions concurrently with site investigation activities when possible
- expediting agency approval when no further action is warranted.

The U.S. Navy and State of California regulatory agencies have agreed to accelerate and streamline the cleanup process to the maximum extent possible.

The NAF El Centro Cleanup Team is working toward completing cleanup at all IR Program sites by the year 2007. When possible, a fast-track approach to site closure is implemented under the *removal action process*. Engineering Evaluation/Cost Analyses and Action Memoranda were used to accelerate the complex investigation and cleanup process. The Cleanup Team's commitment to reaching site closure goals expeditiously and cost effectively has been successful.

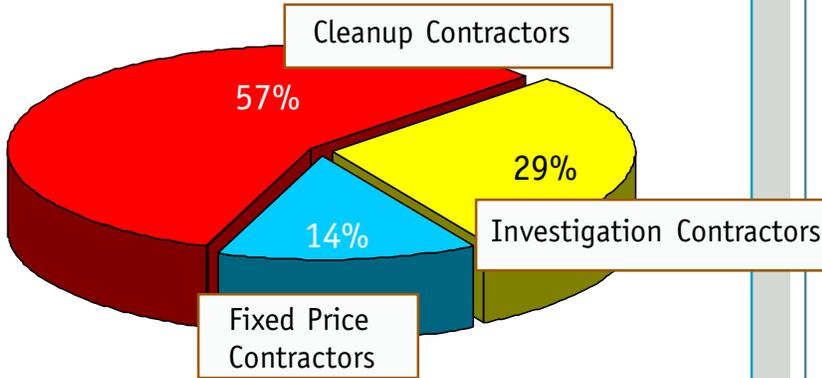


Environmental Cost Information



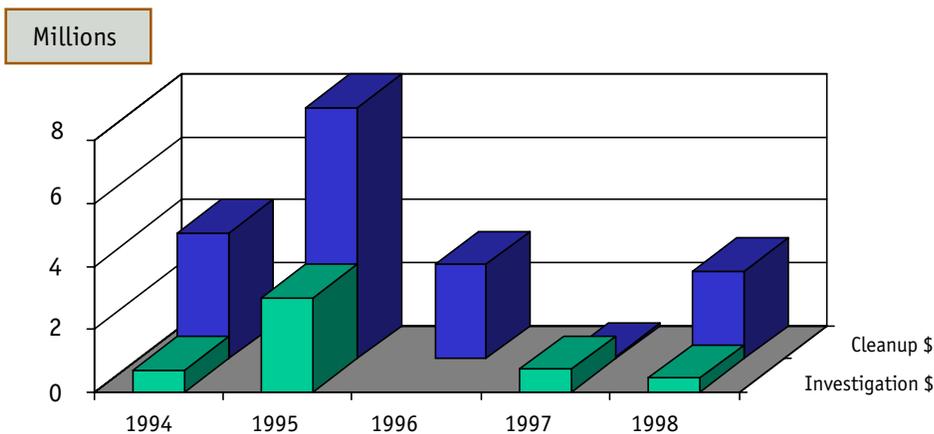
Soil samples are taken using a hard auger to avoid major impacts to this wheat field located on NAF El Centro.

Contractor Funding



The New River Gorge, west of NAF El Centro, is only one of the natural resources considered during environmental cleanup.

Environmental Costs



Environmental Glossary

Action Memorandum - documentation of cleanup levels to be reached by the standards outlined in an Engineering Evaluation and Cost Analysis (EE/CA).

Bio-attenuation - a biological process that uses naturally occurring organisms in the soil to degrade organic contaminants such as gasoline, oil, and fuel.

Contaminant - Any element, substance, compound, or mixture, which after release into the environment may cause adverse health effects.

Disposal - The discharge, or placing of any waste into or on any land or water so that any constituent may enter the environment.

DoD - Department of Defense.

Engineering Evaluation and Cost Analysis (EE/CA) - an analysis of removal (cleanup) alternatives for a site.

Environment - Includes any surface water, groundwater, land surface or subsurface strata, or ambient air.

Free product - "liquid phase" hydrocarbons existing below the ground surface as free mobile liquids on groundwater.

Groundwater - Water in a saturated zone beneath the ground surface.

In-situ - Latin for "in place".

IR Program - Installation Restoration Program established in 1984 to help identify, investigate, and cleanup contamination on DoD properties.

Metals - heavy metals (such as lead, chromium, cadmium, etc.) that can be toxic at relatively low concentrations.

NAF - Naval Air Facility.

No Further Action Sites - Sites that do not warrant moving further in the site evaluation process; a site that does not pose a significant threat to public health or the environment.

Petroleum hydrocarbons - a class of chemicals usually associated with gasoline, oil, and fuel.

POL - Petroleum, oil, and lubricants.

(PCB) Polychlorinated Biphenyl - Any chemical substance with the chlorinated biphenyl molecule. Prior to stringent regulation of PCBs, PCBs were used as a fire retardant and for other purposes, such as sound insulation felt and electrical cables.

(PAH) Polynuclear Aromatic Hydrocarbons - A compound consisting of hydrogen and carbon atoms arranged in multiple rings.

(PA) Preliminary Assessment - Consists of a review of available historical information concerning installation activities and land use. A PA may include an on-site reconnaissance, if appropriate.

PWC - Public Works Center.

Remedial Action Contract - A contract which the Navy uses to provide for remediation and long-term maintenance of Navy IR Program sites.

Remedial Action - an immediate action taken over the short-term to address a release or threatened release of hazardous substances.

Removal Actions - An action that reduces the potential threat to human health and the environment.

Site Characterization - Site sampling, monitoring, and analysis activities to determine the extent and nature of contamination at a site.

Site Inspection - An on-site visit consisting of limited sampling and analysis designed to verify and augment the preliminary findings of the PA.

Solvents - a substance capable of dissolving another substance to form a solution. Solvents are chemicals used as industrial cleaners, paints and other substances that can be flammable and toxic to varying degrees.

Underground Storage Tank - Tanks and attached piping containing regulated substances in which 10% or more of the tank volume (including piping) is beneath the surface of the ground.

NAF El Centro

Project Points of Contact

Captain Badger

Commanding Officer
Naval Air Facility El Centro
1605 Third Street, Building 214
El Centro, CA 92243-5001



Art Tamayo

Underground Storage Tank Program
Manager
Environmental Division
NAF El Centro
1605 Third Street, Building 504
El Centro, CA 92243-5001
(760) 339-2358



Fred Rivera

Manager
Installation Restoration Program,
Environmental Division
NAF El Centro
1605 Third Street, Building 504
El Centro, CA 92243-5001
(760) 339-2226



Mike Riley

Remedial Project Manager
Naval Facilities Engineering Command
Southwest Division
1220 Pacific Highway,
Code 522.MR
San Diego, CA 92132-5190
(619) 532-3686



Dan Guenthner

Environmental Manager
NAF El Centro
1605 Third Street, Building 214
El Centro, CA 92243-5001
(760) 339-2519

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Produced for
Naval Air Facility
El Centro
by
Southwest Division
Naval Facilities
Engineering Command
Business Department
1220 Pacific Highway
San Diego, CA 92132