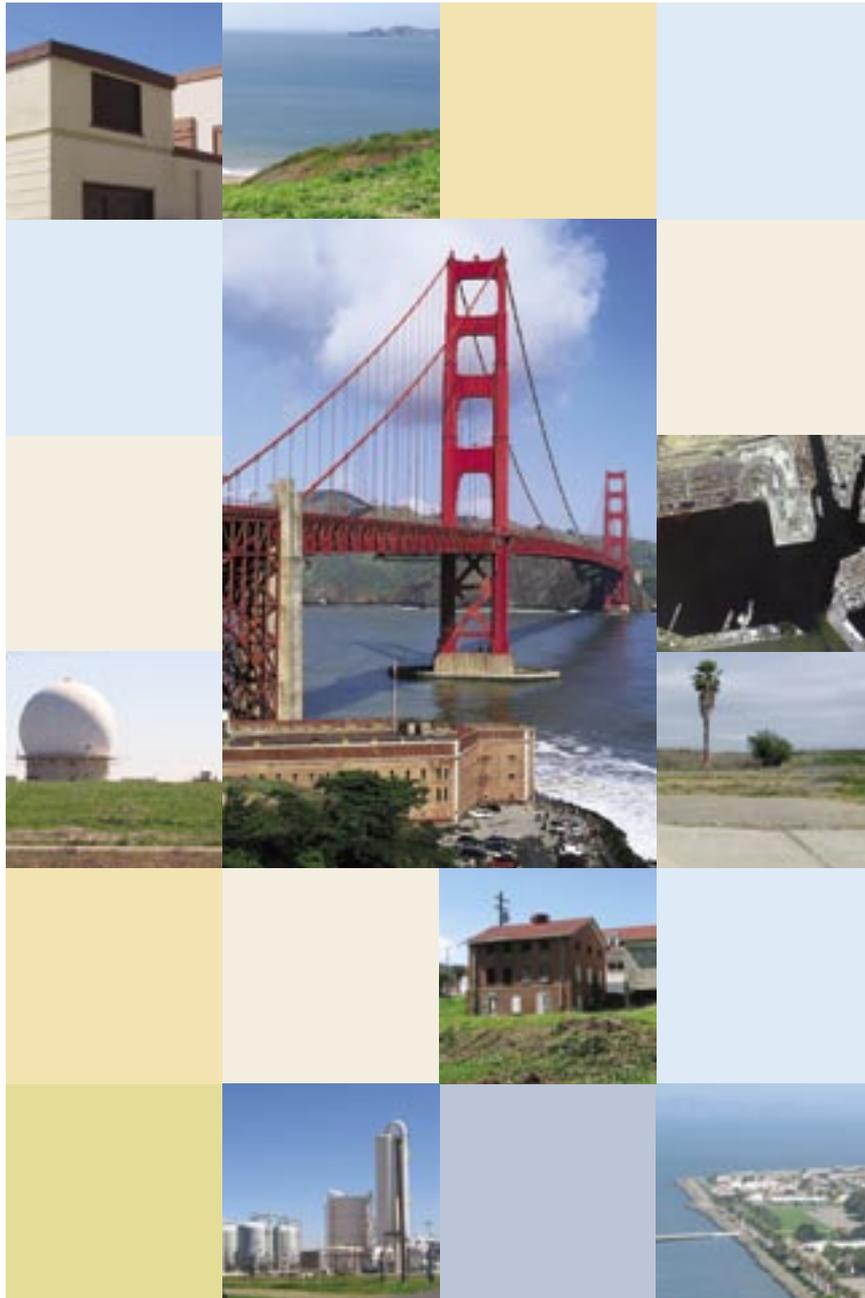


California Military Base Reuse



**Department of Toxic
Substances Control**

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Part One: Introduction and Regulatory Issues

Military Base Closures and California

In 1988, the United States Department of Defense (DoD) began the military Base Realignment and Closure (BRAC) process in an effort to streamline operations and increase DoD efficiency. Since then, DoD has closed 97 major military installations nationwide. Twenty-three closures, four realignments and two other facility closures occurred in the State of California. Another round of base closures is scheduled to occur in 2005, unless postponed by the United States Congress, and with 36 major and 25 minor active military installations still operational, it is possible that California will face additional closures.

Formerly Used Defense Sites

In addition to the installations closed by the BRAC process, California has an estimated 1,200 formerly used defense sites (FUDS). FUDS are properties which have had historical use by the military and/or its civilian contractors. FUDS are former military installations that were closed and transferred prior to October 1986.

Contamination at Former Military Facilities

FUDS and BRAC properties often have significant environmental contamination from past uses. Decades of industrial, training and waste management practices left behind contamination in unlined landfills, burn pits, plating shops, degreasing operations, polychlorinated biphenyl (PCB) transformer

areas, leaking fuel lines and storage tanks, industrial waste treatment plants, weapons training ranges, and other uncontrolled disposal areas. The occurrence and severity of environmental contamination varies widely because military base property was used for everything from military airports and testing ranges, to residential areas and schools. The hazardous substances released to soil, surface water, and groundwater are dangerous to people, plants and animals. They must be cleaned up or the hazard reduced to acceptable levels.

Environmental Regulatory Oversight

DoD is required to comply with the 1980 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund), the Resource Conservation and Recovery Act (RCRA), and other environmental laws and regulations. Many states, including California, have also passed environmental laws that regulate environmental contamination on military property and require environmental compliance by the military departments.

The State of California began regulating environmental conditions at military installations in the early 1970s, primarily through water pollution laws and discharge permits administered by the Regional Water Quality Control Boards (RWQCB). At that time, the toxics program was in its infancy, with a small group of people working within the Department of Health Services. With the 1972 passage of the California Hazardous Waste Control



Groundwater extraction well at McClellan Air Force Base, once used for drinking water but later used in the treatment of contaminated groundwater.

Act, the State of California began to regulate hazardous waste generation and disposal, eventually leading to the creation of the Department of Toxic Substances Control (DTSC).

Throughout the early 1980s, several military facilities were listed on the National Priorities List (NPL), created by the passage of CERCLA. Project managers were assigned to a number of installations, and regulatory oversight of military installations became a large enough category of Superfund sites for DTSC to dedicate a group to for that oversight. California and other states recognized the importance of having funding from DoD to fund state regulatory agencies working on DoD projects. To that end, the State and DoD reached an agreement in the mid-1980s known as the DoD and State of California Memorandum of Agreement (DSMOA). When the California Environmental Protection Agency (Cal/EPA) formed in 1991, it made military base reuse and property transfer an important part of its work.

Economic Impact of Base Closures

When DoD began its BRAC effort in 1988, the State of California recognized the potentially devastating economic effect of base closures at the local, regional and statewide levels. California had more base closures than any state in the nation, with an estimated economic loss of \$7 billion and 200,000 jobs. The importance of returning closed military property to economic viability was not lost on the regulatory community. It also recognized the need to ensure that public health and the

environment were protected during and after reuse and redevelopment activities.

The Office of Military Facilities

In an effort to quickly return the closed military installations to productive use, DTSC created the Office of Military Facilities (OMF) in 1993. DTSC recognized the need to have staff and resources dedicated to the regulatory oversight of military base reuse and redevelopment. Today, OMF is located within the Site Mitigation and Brownfields Reuse Program of DTSC, within Cal/EPA. OMF now has 60 staff members at regional offices in Sacramento, Berkeley and Cypress. An annual budget of approximately \$18 million is funded by a cooperative agreement with DoD, a cost recovery agreement with the Navy, and direct cost reimbursement agreements with entities that have taken title to transferred military property.

Ultimately, the goal is to work with DoD or private entities to ensure that reuse and redevelopment of the closed military properties protects the citizens and environment of California.

Beyond ensuring proper cleanup of closing military installations, OMF also oversees environmental cleanup at open military installations. OMF ensures that current activities and ongoing base missions do not pose a risk to public health and the environment.

The Regulatory Process

A series of State and federal laws give California the authority to regulate the remediation of contaminated property. The two most



Dual Phase Treatment System, that combines Soil Vapor Extraction systems with groundwater treatment systems, used to treat groundwater contamination at McClellan Air Force Base.

prominent federal statutes in the regulatory process at closed military facilities are CERCLA and RCRA.

For military facilities, DoD is responsible for funding and implementing remedial actions. At every step of the cleanup process, DTSC and other state and federal regulatory agencies oversee military remedial actions.

The role of OMF in military base remediation and reuse is to verify that all hazardous substances releases have been investigated and adequately cleaned up.

CERCLA

Also known as Superfund, this federal law authorizes the United States Environmental Protection Agency (U.S. EPA) to respond directly to releases of hazardous substances that may endanger public health or the environment. The Superfund Amendments and Reauthorization Act of 1986 (SARA), amended and reauthorized CERCLA for five years at a total funding level of \$8.5 billion. SARA also strengthened state involvement in the cleanup process, and encouraged the use of new treatment technologies and permanent solutions.

CERCLA also created the NPL, the U.S. EPA's list of top priority hazardous waste sites in the country that are subject to the Superfund program. U.S. EPA takes the lead regulatory agency role for sites on the NPL, while the State takes the lead regulatory role for non-NPL sites.

Because CERCLA holds past and present property owners liable for contamination,

DoD is responsible for the costs of remediation at sites owned or operated by the military. When property is transferred from DoD to another owner, as with transfers of any contaminated property by private parties, agreements are made between DoD and the future owners so that future property owners are not taking too great a risk by accepting the former military property.

To ensure that current and future users of a site and its vicinity are not endangered by environmental contamination, CERCLA and associated regulations defined a process through which sites are investigated and remediated. The CERCLA cleanup process involves several steps, which do not necessarily occur sequentially, but must each be completed. An emphasis is placed on public participation throughout the cleanup process.

The process overview outlined below is intended to ensure protection of public health and the environment.

Site Screening – An initial review of all available information; used to determine whether further investigation is required.

Preliminary Endangerment Assessment – Conducted to determine whether current or past hazardous substances handling practices have resulted in the release or threatened release of hazardous substances to the environment that may pose a threat to public health and/or the environment.

No Further Action – Following the initial screening and assessment, it may be determined



Monitoring wells on a former landfill turned baseball diamond at the former Presidio of San Francisco.

that sites do not pose a threat to public health or the environment, indicating that “no further action” is required at the site.

Remedial Investigation and Feasibility Study (RI/FS) – The RI/FS workplan is developed to investigate the nature and extent of site contamination, the risk posed to public health and the environment, and the available remediation methods for the site.

Draft Remedial Action Plan – Contains a summary of the RI/FS, a summary of the health risk assessment, and presents the proposed remedy for the site; prepared concurrently with California Environmental Quality Act (CEQA) documents; involves public notice and a 30-day public comment period.

Final Remedial Action Plan – Selection of the final remedy for the site following the public comment period; includes a response to comments and an additional public notice of the selected final remedy. The Remedial Action Plan serves as a public information source on the history, characteristics, and risks associated with a site, evaluates alternative cleanup remedy choices, and provides assurance that the remedy selection process meets legal requirements.

Removal Action Workplan – If the removal action will cost less than \$1 million, sites are exempted from the Remedial Action Plan process, and a Removal Action Workplan is created instead; Removal Action Workplans can also be conducted as interim remedial

actions that are not the final remedy for the site.

Design and Implementation – The chosen cleanup remedy is designed and implemented.

Record of Decision – The decision document that explains how the remedy decision was made and, if cleanup is required, which cleanup alternative(s) will be used. This document also provides a legal record of how the selected remedy complies with all statutory and regulatory requirements.

RCRA

In 1976 with RCRA, Congress amended the first federal solid waste legislation, the Solid Waste Disposal Act of 1965. In RCRA, Congress established initial directives and guidelines for U.S. EPA to regulate and manage solid waste, including hazardous waste. RCRA established a regulatory system to track hazardous wastes from the time of generation to final disposal. The law requires safe and secure procedures to be used in treating, transporting, storing and disposing of hazardous wastes. RCRA was designed to prevent new, uncontrolled hazardous waste sites.

RCRA’s “cradle to grave” provisions give state regulatory agencies authority to regulate solid and hazardous wastes. In addition, DTSC is authorized to implement RCRA in California in lieu of U.S. EPA.



Former military housing area at Treasure Island Naval Station. Housing areas built before 1970 often have contamination from lead-based paint and asbestos.

Current Issues

A variety of issues are commonly encountered at military installations and FUDS. The following describes many of them and the challenges they pose.

Lead-based Paint

Lead contained in lead-based paint is not regulated as a hazardous substance when it is used for its intended purpose. However, when lead is released to soil from lead-based paint the contaminated soil is regulated by DTSC as a release of a hazardous substance. Many areas around military buildings, particularly housing areas and even areas where hazardous chemical may not have been used, have contamination in the soil from lead-based paint. It must be cleaned up to protect people and wildlife. Lead exposure can cause lead poisoning in children producing depressed learning abilities and neurological damage.

Asbestos

Similar to lead contained in lead-based paint, asbestos is not regulated as a hazardous substance when used for its intended purpose. However, when asbestos has entered soil, the contaminated soil is regulated as a hazardous substance release. It must be cleaned up to protect people and wildlife from exposure to friable (crumbling) asbestos in building materials. Friable asbestos is associated with long- and short-term lung diseases.

RCRA Permits and Regulatory Closure

RCRA requires permits for certain hazardous waste management activities. Many military installations, based on their operations, stored and disposed of hazardous wastes which required RCRA permits. The RCRA permits that govern these activities must be closed out at the end of the waste storage or disposal period. RCRA requires that permit-holders go through a specified closure process that includes a public comment period. Any change in ownership of a property with a RCRA permit requires a permit modification because RCRA liability can transfer to the new owners if the new owner chooses to continue the permitted hazardous waste activity. A permit can be modified or revoked and reissued to the new owner. When the facility no longer is used for permitted hazardous waste activities, the facility and permit closure process begins which can include termination of corrective action.

For bases that are undergoing cleanup using the CERCLA process, the military has sought to integrate closure and post-closure requirements into their applicable CERCLA obligations. While the two laws have similar requirements, the RCRA closure process imposes additional public notice actions that must be performed. As these actions are not required by CERCLA, DTSC has constructed a process that DoD can follow which facilitates the use of a separate or equivalent RCRA closure process when closing out permitted units.



Institutional controls in action: Signs warn visitors to Treasure Island Naval Shipyard to stay away from the remediation of a former gas station.

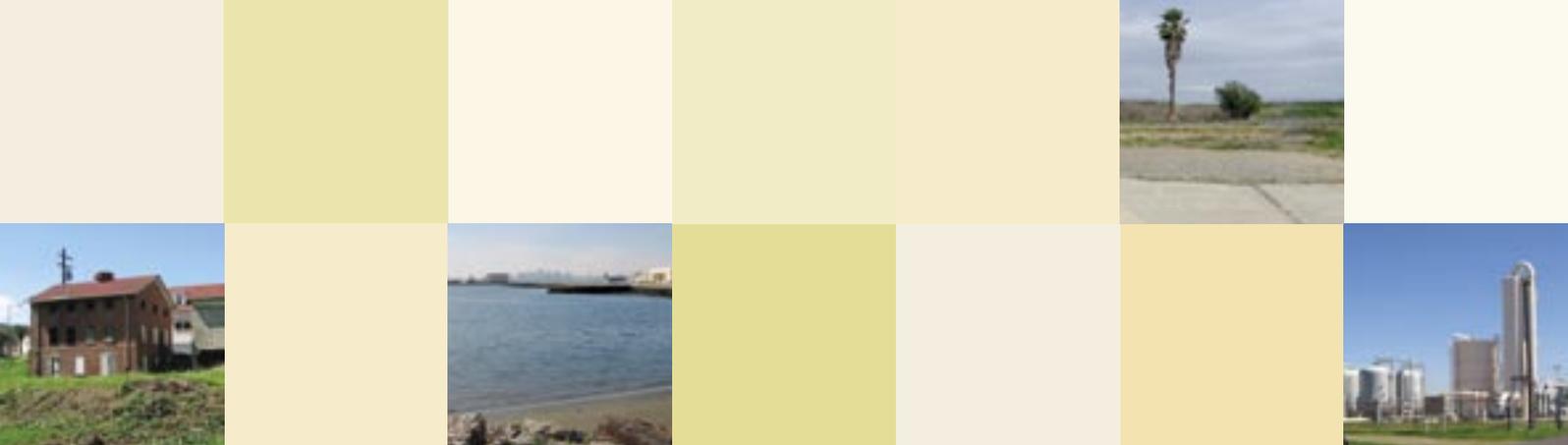
Institutional Controls

Any site not cleaned to unrestricted use standards must have some form of institutional controls, which are included to protect public health and the environment. In general, the term “institutional controls” is used to describe a suite of both engineering and administrative controls placed on a site to prevent contact with contaminants by future users.

Engineering controls are any physical barrier preventing contact with contaminants or migration of contaminants offsite. Clay/synthetic caps and grout walls are examples of possible engineered controls that minimize the possibility of exposure to contaminants by property users.

Administrative controls, on the other hand, are non-engineering mechanisms that restrict activities on the site to prevent exposure to contaminants by property users. These can include deed restrictions, land use covenants, public notice and warning signs.

Land Use Covenants (LUCs) are an important part of the remedy selection at former industrial or military sites, and are required by California law for any site with contamination that remains. Assurances must be made that the remedy will continue to protect human health and the environment into the future. LUCs provide the assurance that any contamination remaining on the site will not be disturbed and the remedy will continue to operate effectively. LUCs are essentially requirements placed on all successive property owners that land use restrictions will continue to apply into the future. These covenants are recorded by the property owner in the county where the property is located and run with the land.



Cleanup Standards

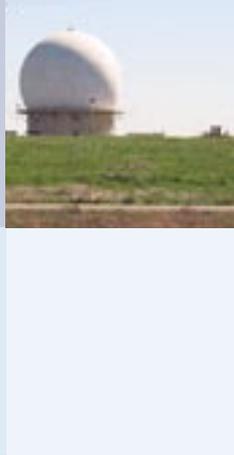
Unrestricted Use vs. Commercial/Industrial Cleanups

Federal and State laws require that cleanup of contaminated sites protect human health and the environment. Cleanup to unrestricted use involves removing contaminants to either non-detectable levels or levels which are safe for humans and environmental receptors. Unrestricted use means that hospitals, daycare centers, single family houses and other “sensitive uses” can be built on the property without danger to future users. Sometimes, cleanup to unrestricted use is not feasible due to the type and extent of contamination and the resulting expense involved in the cleanup.

When a site cannot be cleaned to unrestricted use, a commercial/ industrial cleanup standard is used. This requires that the site be cleaned to a level that is commensurate with the future use of the site. For example, Oakland Army Base will be redeveloped for commercial and industrial purposes. Most of the base will be covered by pavement or buildings so people and other environmental receptors will not likely come into contact with contaminants left onsite.

The level of cleanup required for an industrial redevelopment, like Oakland Army Base, would be less stringent than the level of cleanup required for a natural habitat restoration project. This same situation is true at the Presidio of San Francisco, where environmental receptors (birds, fish, and other wildlife) are likely to come into contact with contaminated soil; therefore, cleanup requirements would likely be the same standards for unrestricted use. Institutional controls, such as LUCs, deed restrictions, and other methods discussed in a previous section, must then be placed on a property wherever unacceptable levels of contamination remain.

It is believed that land use restrictions make financing of redevelopment difficult, such as when residential development restrictions are placed on a property. Some communities have responded to such opinions with a reluctance to allow restrictions. DTSC works closely with communities, developers and the military to allow transfers to happen with the appropriate level of cleanup and land use controls.



Close-up of remnants of a 37mm round found at the Tourtelot property, site of the former Benicia Arsenal.

Munitions and Explosives of Concern

The presence of munitions and explosives of concern (MEC) complicates cleanup at military facilities and reuse of military property. Military munitions are part of a broad category that includes MEC, and a range of other “ammunition, ammunition components, chemical or biological warfare materiel or explosives that have been abandoned, expelled from demolition pits or burning pads, lost, discarded, buried, or fired.” (<http://www.nao.usace.army.mil/Projects/Nansemond/OrdnanceQA.htm>)

Munitions and explosives of concern also include unexploded ordnance which U.S. EPA defines as “military munitions that have been primed, fused, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material and remain unexploded either by malfunction, design, or any other cause” (Title 40, Code of Federal Regulations, Section 266.201).

Munitions and explosives of concern are often found at former military training ranges and disposal areas, such as Fort Ord in Monterey County, Former Camp Beale in Yuba and Nevada Counties, and the Tourtelot property portion of the former Benicia Arsenal in Solano County. MEC are sometimes found in unexpected locations on military installations because of the changes over time in property use at these installations.

Cleaning up MEC is dangerous. Vegetation must be reduced or removed before ordnance clearance professionals can walk the site to identify MEC. Whenever possible, MEC items are detonated in special blast chambers or are shipped to another disposal facility, while MEC that cannot be safely moved is detonated in-place. While methods for MEC clearance have improved dramatically over time, existing methods cannot guarantee, with 100% certainty, that all MEC has been removed from an area even after state of the art clearance.

Until methods can be developed that provide complete assurance that all MEC has been removed from an area, DTSC will require restrictions to be placed on future land uses of MEC areas.



Dredge ponds on the Western Early Transfer property at Mare Island Naval Shipyard. The State Lands Commission took title to the property, and Weston Environmental Solutions accepted environmental cleanup responsibility through Early Transfer from the Navy.

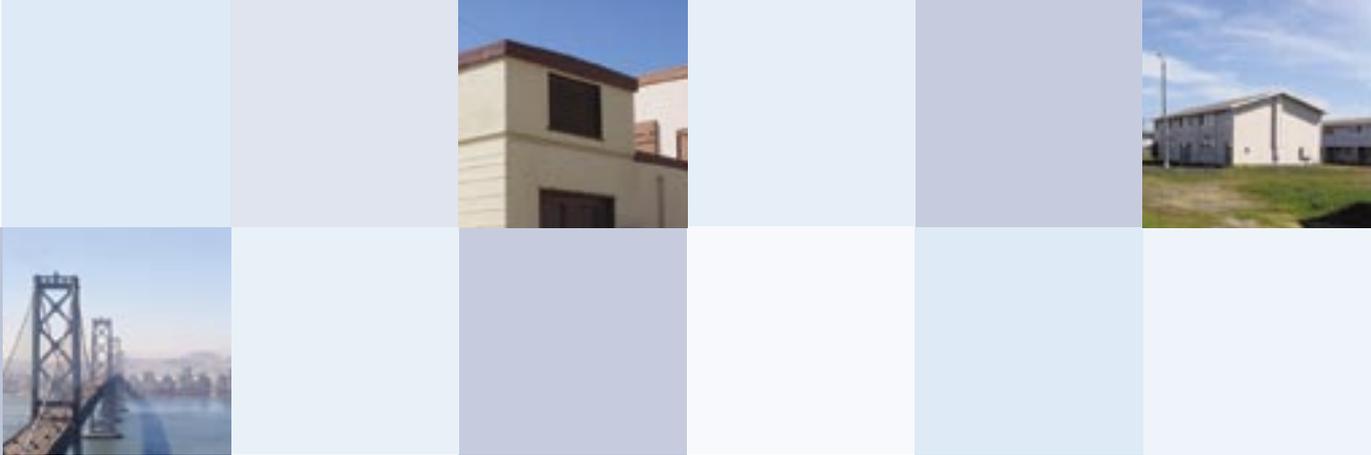
Early Transfer Process

As amended in the 1997 National Defense Authorization Act, CERCLA allows that the U.S. EPA Administrator or the Governor of a state may defer the covenant warranting cleanup when transferred property is not completely remediated. This covenant deferral is allowed when the U.S. EPA Administrator or Governor determines that the property is suitable for transfer, and that there are assurances that all remaining remedial actions will be taken following the transfer. This covenant deferral process is known as an Early Transfer.

For NPL sites, both the U.S. EPA Administrator and the Governor must agree to the Early Transfer; for non-NPL sites, the Governor must approve of the Early Transfer. This authority allows federal property to be transferred prior to completion of environmental remediation, provided that (1) the property is suitable for transfer for the intended use by the property recipient, and (2) the intended use is consistent with protection of human health and the environment. A transfer agreement must also be established to include assurances that (1) remedial action will be taken, (2) a 30-day public comment period be held, and (3) the Early Transfer will not delay remedial action. Although the property may transfer “in deed” to a non-federal entity, the transferring federal agency retains responsibility for the cleanup. The property recipient may also accept environmental cleanup responsibility through a cooperative agreement between the transferring federal agency and the property recipient.

The Early Transfer process requires the Governor to determine that the property is suitable for transfer for its intended use and to ensure that the State does not assume an unacceptable risk. In many instances DTSC is the State agency that provides the Governor’s Office a thorough analysis of environmental and regulatory issues to facilitate his or her decision.

To date, OMF has completed eleven Early Transfers of property under the Governor’s signature. Three additional Early Transfers are in ongoing negotiations. The Stockton Naval Computer Station, Mare Island Naval Shipyard, Mather Air Force Base, Fleet Industrial Supply Center Oakland, Fort Ord, Oakland Army Base, and Hamilton Army Airfield, are examples of Early Transfers and are profiled in this document.



Public Participation

DTSC, through its Project Managers, Public Participation Specialists and agency leadership, include the public in the investigation, remediation and transfer processes. DTSC helps to ensure that the public is informed and protected through public notice, public hearings, fact sheets, and through working with Restoration Advisory Boards and Community Advisory Groups at each installation.

Elements of Success

What makes for a successful property transfer from a regulatory perspective?

DTSC has recognized key factors in the success of military facility property transfers.

Involving Regulators Early and Often: DTSC involvement throughout the reuse planning process can ensure that redevelopment plans are consistent with the environmental conditions of the site. Including the regulatory perspective early in the planning process can make the entire investigation, remediation, and redevelopment process easier in the long run.

Adequate Site Characterization: Having a complete picture of the environmental conditions is critical to the investigation, remediation and transfer of former military installations and can produce more realistic redevelopment plans. It should include historical land uses, past practices, types and amounts of chemicals used, waste disposal practices, and a variety of data on site conditions.

When it comes to data, more isn't always better. Properly planned, high quality environmental information is essential to having useful data for the investigations and feasibility studies. For example, the Environmental Baseline Survey at Alameda Naval Air Station contained 18 volumes of data on site conditions; however, much of this data was invalidated due to inadequate sample planning and sampling methods.

Effective Communication: The complicated environmental, legal and technical issues involved in the remediation and transfer of military installations, or for any contaminated site, are often debated. Effective communication requires that all involved parties understand their respective role and interests in order to understand their differences and develop effective solutions.

Emphasis on Effective Teamwork: Across the State, the most successful base transfers have occurred where all parties have focused on building an effective working relationship. Developing shared expectations on objectives, timelines and budget can go a long way toward transfer success.

For example, the team at Treasure Island Naval Station, including the U.S. EPA Remedial Project Manager, the Navy Base Environmental Coordinator, and RWQCB and DTSC representatives, worked very well together. The group emphasized teamwork through team building activities, which has kept team members motivated throughout the long and difficult process of site investigation, remediation and transfer. The team prioritized work to ensure that the most pressing issues were dealt with in a timely manner, and at the State level, the workload has been split between DTSC (CERCLA issues) and RWQCB (petroleum sites).



The heavily contaminated Seaplane Lagoon and distant industrial buildings at the former Alameda Naval Air Station.

Part Two: Successful Milestones

The pages that follow contain profiles of 17 former military properties highlighting the history of the base, its environmental conditions, transfer process, future use, challenges, and elements of success. These profiles illustrate what works well in base transfer. For more information on any of these projects, or additional military facilities projects, contact OMF or visit the DTSC website at <http://www.dtsc.ca.gov>.

Alameda Naval Air Station

Alameda Naval Air Station provided support for naval air operations beginning with the World War II build-up and continuing through the end of the 20th Century. Home to aircraft carriers, aircraft maintenance and other support activities, Alameda Naval Air Station had as many as 18,000 civilian employees and military personnel at its peak operations. Alameda Naval Air Station closed in 1997, representing a significant loss to the City of Alameda and to the East Bay region.

The land under Alameda Naval Air Station was destined to be contaminated before it was even built. Pre-Navy industrial operations released polynuclear aromatic hydrocarbons (PAHs) onto the site and into the bay. Contaminated sediments were later dredged and the spoils were used to construct Alameda Naval Air Station. PAH contamination created the “marsh crust” layer at four to ten feet below ground surface, which is a thin layer of PAHs and oil believed to come from historical waste discharges prior to infill. The Remedial Action Plan and Record of Decision were signed in 2000, and institutional

controls restrict digging that would puncture the crust.

During Naval operations, hazardous waste was generated, stored and disposed of on site, leaving about 40% or more of the base contaminated. The former Alameda Naval Air Station property is on the NPL, with 31 CERCLA sites and 21 petroleum sites. While cleaning up the former Air Station is complicated, redeveloping the 1,600-acres of upland property will significantly increase the geographical and economic size of the City of Alameda.

Early Transfer of the entire base was contemplated in 2003. Negotiations between Navy and the City of Alameda failed to reach an agreement on cleanup costs; estimates varied from \$50 million to \$600 million. Early Transfer negotiations have been abandoned, and the base will instead transfer by traditional mechanisms as remedial actions are completed and property is deemed suitable for transfer. The 72.5-acre East Housing parcel transferred in deed from the Navy to the City of Alameda. Former base housing on the East Housing parcel have been demolished, and construction of a new residential area has begun.

Meanwhile, extensive interim reuse of the former Alameda Naval Air Station is underway. Reuse activities include filming for television and movies, an outdoor antique auction, an environmental technology incubator, a boat repair operation, furniture manufacturing, homeless services, dockage by Federal Maritime Administration ships, and recreational uses. Future redevelopment will include residential



development around a mixed use core, a seaplane lagoon, golf course/resort area, wildlife refuge and commercial/light industrial uses.

The ecological value of portions of Alameda warrants consideration as well; a wildlife refuge is planned on the former airfield runway for the endangered California Least Tern, the California Brown Pelican and the American Peregrine Falcon.

Castle Air Force Base

Beginning in 1941, Castle Air Force Base operated as a Strategic Air Command training base for the U.S. Air Force. Located in Merced County, the base was used for flight training, aircraft maintenance and fire training until it was closed in 1995. While some industrial activities, namely aircraft maintenance, were performed at Castle, the primary operations at the installation were not industrial. Therefore, the cleanup challenges at Castle, while still significant, are not as substantial as at some other installations.

Waste fuels, oils, solvents and other chemicals were disposed of in pits at landfills until 1977. A 1989 Federal Facilities Agreement between the U.S. EPA, Castle Air Force Base, and DTSC identified DTSC as the lead state agency. The primary chemical of concern at Castle is trichloroethylene (TCE) in the groundwater, and perchloroethylene, benzene, chloroform, chloromethane, 1,2-dichloropropane, and toluene have also been detected.

The Air Force took an aggressive approach to treating contaminants in the groundwater

at Castle. They cut the cleanup timeframe from 50 years to 20 years through soil vapor extraction at contamination source areas and aggressive treatment of the groundwater plume. Merced County and the City of Atwater cooperated fully with the Air Force's installation of monitoring and extraction wells, which allowed for more effective treatment of groundwater contamination.

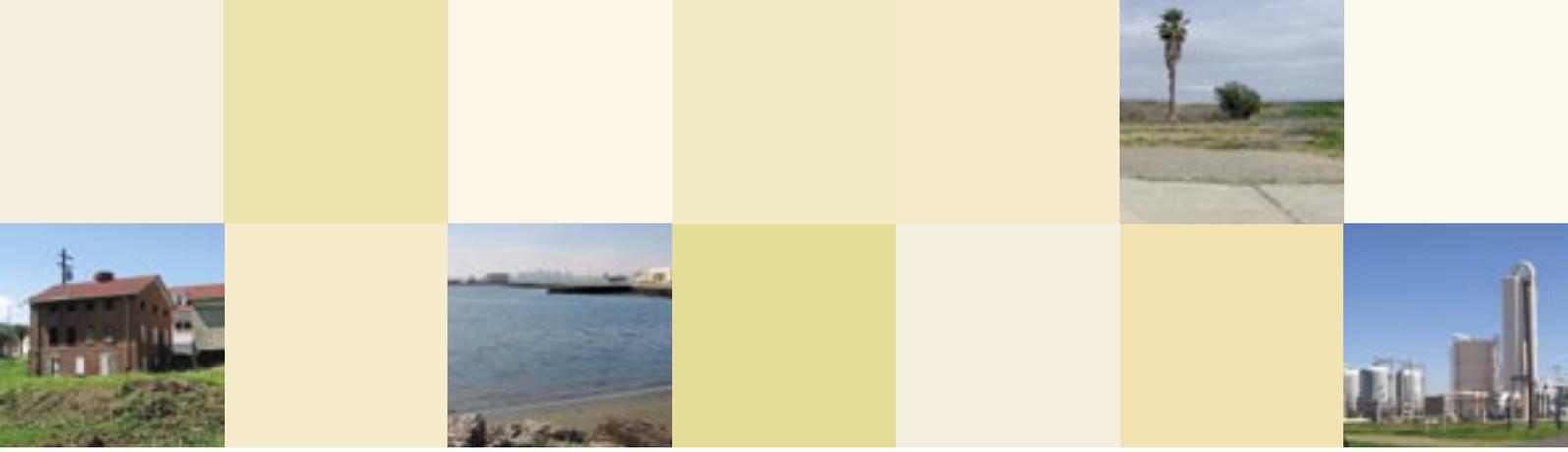
Regulatory agencies have granted Operating Properly and Successfully status for the soil and groundwater contamination treatment systems, which signifies that treatment systems have been put in place and are successfully addressing contamination issues as part of CERCLA requirements.

DTSC is continuing to work with the Air Force and the County of Merced to ensure that the property will transfer with all required assurances that proper cleanup will be completed.

Most of the base has been leased to Merced County. The Air Force intends to transfer much of the base in deed by the end of 2005. Despite its rural location in Merced County, the former Castle Air Force Base has begun a successful program of reuse and redevelopment resulting in more than 2,000 new jobs.

Fleet Industrial Supply Center Oakland

The Fleet Industrial Supply Center Oakland (FISCO) used a "brownfields approach" in its reuse plans that combined investigation,



remediation and redevelopment concurrently. The 531-acre FISCO provided supplies and support services to fleet units and shore activities for the Navy from 1941 to 1998. Industrial activities resulted in contamination from asbestos, paint sludge, and PCBs. Slated for closure in the 1995 BRAC, the property that once served as home to FISCO has now been fully integrated into the Port of Oakland, with few remnants of its military past.

In December 1998, the Port of Oakland, the Navy and DTSC decided to pursue an Early Transfer. Within six months the Governor accepted the Navy's Early Transfer proposal, with the Port of Oakland agreeing to take on the responsibility for cleanup. Confidence in the Port's ability to complete the cleanup helped speed the Early Transfer process.

The extent and type of contamination was known at the time of transfer, though no remedy had yet been selected. The eventual remedy selected includes groundwater monitoring and filling the port area to control sediment contamination. The cleanup strategy used the U.S. EPA's Superfund Accelerated Cleanup Model approach, including early identification and removal of contaminated media that pose risks to human health or the environment or that are sources of groundwater contamination. Institutional controls restrict residential development and "sensitive uses." Planned commercial and industrial uses made Early Transfer realistic and kept the cleanup costs down. Deed transfer from the Navy to the Port of Oakland took place in 2001.

The Port of Oakland, through its \$700 million capital improvement program "Vision 2000," built an intermodal marine terminal at FISCO, with railroad and truck cargo activities. Early Transfer made it possible for remedial activities to be completed and property transfer to occur at least two years before it otherwise would have. The Early Transfer process at FISCO exemplifies the progress possible when all parties seek new ways to revitalize closing bases and transform them into economic and revenue anchors for their communities.

Fort Ord

Located along the beautiful California coastline of Monterey Bay, the nearly 27,000 acres of the former Fort Ord once served as a training and staging area for light infantry troops for the U.S. Army. Opened in 1917, the World War I-era Army post closed in 1994. Because of its use as a training area for Army soldiers, the property contains a number of firing ranges and ordnance training ranges. The presence of MEC provides the most significant challenge to reuse and redevelopment.

Areas used for ordnance training must go through an extensive clearing process, and often require land use restrictions even after clearance. To investigate and clear a MEC area, crews sweep the area using metal detection equipment and either mark the spot using Global Positioning Systems or flag any hits for further inspection. However, before a sweep can occur, controlled burns, mowing or other methods are used to clear brush that may be covering dangerous MEC.



Main Gate of Hamilton Army Airfield.

The risks involved with clearing a MEC area, such as those at Fort Ord, make the reuse and redevelopment of firing and training ranges very expensive and complicated. Existing technology cannot show that all MEC has been removed, so DTSC cannot certify that all remediation has been completed.

To address the MEC issue, U.S. EPA, DTSC, and the Army have investigated new methods and technologies for MEC clearance. In addition, the local redevelopment authority has proposed a new method allowing concurrent investigation, clearance and development.

DTSC employs layers of protection that include clearance and remediation activities, institutional controls, public educational and restrictive covenants. In the Fritzsche Field Early Transfer, DTSC negotiated a land use covenant that restricts certain uses and a local ordinance that requires the developer to obtain a digging permit and expert MEC construction support for any significant digging.

While explosives were not an issue around the main garrison housing area, lead from lead-based paint had contaminated soil. In negotiating an Early Transfer for this parcel, DTSC worked with the purchaser to resolve lead in soil issues that could not be resolved in negotiations with the Army. The Army cooperated by allowing the developer to sample property and remove any areas of elevated lead prior to transfer.

Through both Early Transfer and traditional transfer mechanisms, more than 12,000 acres

of the 26,904 total acres have transferred as of April 2004. The Army maintains an informative website dedicated to the remediation, transfer and redevelopment of Fort Ord at <http://www.fortordcleanup.com/>.

Hamilton Army Airfield

From tidal salt marsh to military airfield and back again, nature has already begun to regain control of the former Hamilton Army Airfield (HAAF). Pheasants, dragonflies, red-winged blackbirds, hawks, buzzards, rabbits and deer now inhabit the area where jet engines roared just twenty years ago.

The U.S. Army Air Corps constructed HAAF on a reclaimed wetland in 1932. The site served as a staging area for Pacific Theater operations during World War II and was home to fighter planes, bombers, and rescue and transport aircraft. The newly created U.S. Air Force took control of the airfield in 1947, and the installation was renamed Hamilton Air Force Base. The Air Force transferred the base housing area to the Navy in 1975, and transferred the airfield back to the Army in 1976. The Coast Guard took control of part of the base in 1983. The 1988 BRAC round slated both the Navy and Army portions of Hamilton for closure.

The base was contaminated with petroleum compounds, volatile organic compounds, pesticides, metals, PAHs, dioxins/furans, PCBs, and nitroaromatics. Sampling on the airfield has also revealed significant contamination from dichlorodiphenyltrichloroethane (DDT), a pesticide commonly used until the 1970s.



Concrete embankment used for aircraft engine testing which underwent excavation activities.

The Army retained ownership of the airfield throughout the 15-year community debate over future land use. Finally, in 2003, the Army transferred the property to the State Coastal Conservancy through the Early Transfer process. Before the Governor approved the Early Transfer, the Army provided several assurances, including a LUC and deed restrictions for the main airfield, and the Record of Decision and Remedial Action Plan were completed.

OMF facilitated the Early Transfer process, working with RWQCB, the State Lands Commission, State Coastal Conservancy, State Fish and Game Agency, and others. DTSC worked closely with the RWQCB and the Army to protect public safety and environmental health and to ensure the wetlands would be designed and constructed to remediate the site.

Reaching a consensus has been the biggest challenge at HAAF. Cleanup planning meetings were attended by people who had a stake in the remediation plans and future use. It took several years to reach consensus about what the remedy would be and how it would be implemented. The lengthy process paid off. Once the conceptual agreement was made, it took just over one year to finish the Early Transfer.

Before the Governor approved the Early Transfer, the Army provided the necessary assurances that an Early Transfer would not endanger human health and the environment. Assurances for the main airfield included a

LUC and deed restrictions, which prevent the site from ever being used for “sensitive uses” such as homes or schools. The RWQCB issued a cleanup order for the main airfield property, essentially enforcing the implementation of the proposed remedial actions. The lead role has since been turned over to the RWQCB.

Upon excavation and removal of contaminated areas, the concrete runway and other surface areas will be covered by a minimum of three feet of dredge spoils during the construction of the wetlands.

The Hamilton Wetlands Restoration Project will return the airfield to nearly its original state, with reconstructed tidal and uplands marsh across the main airfield property. This will be the largest wetlands restoration in the San Francisco Bay, providing habitat to the endangered California Clapper Rail, California Black Rail, Brown Pelican, Chinook Salmon and the Salt Marsh Harvest Mouse, among other species. Dredged material from maintenance projects and from the deepening of the Port of Oakland will provide the cover material to accelerate the wetlands restoration process.

The remedy selection of the wetlands restoration project for Hamilton, along with several agreements and other assurances as part of the transfer documents, provided the necessary assurances to the Governor that an Early Transfer of the property from the Army to the State Coastal Conservancy would not endanger human health or the environment.



Aerial view of the Long Beach Naval Complex.

The Army signed the LUC with DTSC and RWQCB restricting excavation of the three feet of stable cover material and the construction for “sensitive uses,” (schools, daycare centers, residences) further assuring the Governor that Early Transfer was protective of the public and the environment.

In addition to the restored wetlands, several airplane hangars have been converted into office space now known as Hamilton Landing. Residential construction and light commercial development have begun to rejuvenate the former base surrounding the future wetlands.

Long Beach Naval Complex

Naval Station Long Beach and Naval Shipyard Long Beach combined to form the Long Beach Naval Complex. Since its beginnings in 1946, the Long Beach Naval Complex performed naval support activities, including construction, repair, conversion and overhaul of naval vessels, and housing for military personnel.

The Navy took possession of the land that would become Long Beach Naval Complex in Long Beach Harbor in 1938. The Port of Long Beach retained reversionary rights to the land and harbor. Much of the Naval Complex property ownership reverted to the Port following the 1994 closure of the Naval Station and the 1997 closure of the Naval Shipyard.

Approximately 680 acres of the Naval Complex reverted to the City of Long Beach in 1998. The Port holds title to the property, but the Navy remains responsible for environmental cleanup.

Soil and groundwater contamination at Long Beach Naval Complex primarily resulted from repair and maintenance activities for naval vessels and an onsite dry cleaning facility. Chemicals of concern include volatile organic compounds, semi-volatile organic compounds, total petroleum hydrocarbons, PAHs, metals, and low levels of radioactive materials.

The selected remedies include excavating and capping high concentrations of contaminants and a variety of institutional controls.

For Investigation and Remediation Sites 1 and 2, a combined in-situ air sparging and soil vapor extraction system removed volatile contaminants from the groundwater. This system has been successful enough to move toward long-term monitoring. Institutional controls included LUCs to restrict future uses, which are required for all parcels with remaining contaminants.

At Long Beach Naval Complex, remedial actions were completed for all parcels at the time of transfer. The 90-acre Early Transfer Parcel, known as Parcel 2, remains at the Record of Decision/Remedial Action Plan phase of the cleanup process.

In some cases, DTSC has been able to provide solutions to remediation challenges that are more efficient and less costly than those originally proposed. For example, when the Navy proposed to use a six-phase heating process to remediate solvent contamination at a former dry cleaning facility, the BRAC Cleanup Team agreed to use the contingency



Container ship and cranes at the newly expanded Port of Long Beach.

remedy of excavating the contaminated soil and monitoring natural attenuation for the contaminated groundwater. However, DTSC recommended the use of the innovative technology, Hydrogen Release Compounds (HRC) injected into the groundwater, to speed up the natural attenuation process. This process of excavation and attenuation using HRC rather than the six-phase process has saved the Navy a significant amount of time and money.

Two hundred and seventy four acres of the complex were transferred to the Port of Long Beach, with LUCs in-place restricting use to port-related activities only. Additionally, more than 100 acres of housing was transferred to the City of Los Angeles for non-profit and educational uses.

Early Transfer of several parcels of the Port area are pending negotiations between the Navy and the Port of Long Beach on the details of the cleanup plans.

The involved parties have encountered several challenges in completing property transfers from the Navy to the Port of Long Beach. Debate continues over certification of the RCRA permitted hazardous waste treatment unit at Long Beach Naval Complex. The RCRA permitted unit, located within the Early Transfer parcel, must either be carved out of the parcel or go through clean closure. DTSC has requested one year of groundwater monitoring for hexavalent chromium to determine if clean closure is achieved.

One significant challenge has been the removal of contaminants during construction. Port terminal construction is not regulated by DTSC. However, hazardous waste encountered during the construction process is regulated. To ensure that the Port's activities have met the requirements of CERCLA, the Navy has generated technical memos documenting any removal activity by the Port, which were then reviewed by DTSC and accepted as part of the remedy.

Deciding upon the type of remedial action to be taken has been another challenge. For Site 7, the submerged portion of the property, DTSC proposed an interim remedy of clean fill cover over the contaminants in the sediments. The U.S. EPA and DTSC ultimately agreed to require immediate dredging, and that the remedial documents would include timetables to ensure the cleanup process proceeded expeditiously.

Negotiations on the agreement between the Navy and City of Long Beach for the Early Transfer of Parcel 2 are tentatively scheduled to be completed by the summer of 2006. Investigation and remediation challenges include budgets, contracts, required resources, timetables, deadlines, and permits.

Only one other portion of the Long Beach Naval Complex has not yet transferred. One parcel of housing contains residual contamination and is capped. The area has become habitat to the endangered Blue Butterfly. A LUC restricting the disturbance of habitat and restricting resurfacing of the capped area is needed before transfer can occur.



The Aircraft Warning and Signal facility at Mather Air Force Base, located adjacent to the Mather Regional Park.

Challenges have been overcome primarily through a good working relationship between the BRAC Cleanup Team, comprised of the Navy Base Environmental Coordinator, representatives from the Port of Long Beach, and Remedial Project Managers for the Navy, RWQCB, U.S. EPA, and DTSC.

Transfer of Long Beach Naval Complex has promoted the expansion and the continuous upgrading of the Port of Long Beach, one of the busiest container terminals in the United States. A new terminal built by the Port of Long Beach on reversionary property is operating with the shipping company Hanjin as its anchor tenant.

The harbor portions of Long Beach Naval Complex will undergo redevelopment for Port-related activities. The off-site housing areas will be used by schools or colleges for student housing and other non-profit purposes.

Mather Air Force Base

Breaking new ground in the reuse and redevelopment of closed military bases, Mather Air Force Base in Sacramento County has made great strides in making the transition from aging Air Force base to modern business park. Beginning in 1918, Mather served as a Navigator Training Base, as a staging area for B-52s, and as a location for vehicle, weapons and aircraft maintenance. Mather was slated for closure in 1988 and underwent operational closure in 1993.

Before redevelopment could occur, environmental issues at the site had to be addressed.

Environmental contamination at Mather resulted from landfills, fire training areas, fuel spill areas, fuel storage areas, sewage treatment, firing ranges, and a dry cleaning facility. Primary contaminants include volatile organic compounds and petroleum. Remedial actions performed at Mather include extraction and treatment of groundwater and installation of soil vapor extraction systems.

The redevelopment plans at Mather used proceeds from land sales to finance redevelopment activities. The County of Sacramento had to obtain title to the property before selling the land, so Early Transfer of property became one of the cornerstones of the process.

To facilitate the Early Transfer of Mather, DTSC, RWQCB and the County of Sacramento (the property recipient) signed a LUC restricting drilling into, and use of, the underlying contaminated groundwater, and disturbing the soil vapor contamination. Mather became the first Early Transfer in California and one of the first Early Transfers in the nation. Land use covenants between the County of Sacramento and DTSC enabled the reuse and redevelopment of property at Mather at a time when the Air Force was reluctant to discuss land use controls. DTSC continues to work with the County of Sacramento to ensure that LUCs are enforced and remain protective of public health and the environment.

As of April 2004, 1,300 of the 5,845 total acres at Mather have transferred ownership. The remaining property, including the commercial airfield, is under long-term lease to the County of Sacramento.



Dry dock on Mare Island once used for construction and overhauling of naval vessels.

Reuse of Mather has created opportunities for development of a successful office park, housing for the State of California Office of Emergency Services, McGraw Hill, Sutter Health, the Federal Aviation Administration Terminal Radar Approach Control Center, Sacramento County Office of Education, and others. The Mather Airport has become the cargo hub for the Sacramento region. Nearly 4,500 new jobs have been created by the redevelopment of the former Mather Air Force Base.

Mare Island Naval Shipyard

Rich with a distinguished military past, bustling with reuse activity, and brimming with a bright redevelopment future, the former Mare Island Naval Shipyard stands as an example of how environmental regulation and reuse can coexist.

Located off the coast of Vallejo, on the eastern edge of the San Pablo Bay, Mare Island Naval Shipyard began operating in 1854 under the command of Admiral Farragut. Original operations included manufacturing ordnance and building ships. The oldest buildings on Mare Island predate the Civil War. During World War II, more than 45,000 people worked on Mare Island building and repairing war-damaged vessels. Building 505, now the headquarters of the planned San Pablo Wildlife Refuge, once served as the Radio Communications Building, where word that Pearl Harbor had been attacked first reached the mainland United States.

In the early 1920s, Mare Island was constructing and overhauling submarines.

Following World War II, ships used in testing nuclear weapons in the Pacific Ocean were brought back to Mare Island for decontamination. Naval Facilities Engineering Command cites more than 500 naval vessels constructed at Mare Island, and thousands more overhauled at the shipyard.¹

The closure of Mare Island Naval Shipyard resulted in the loss of 7,567 civilian and 1,963 military jobs and had a significant economic and social impact to the Vallejo area.

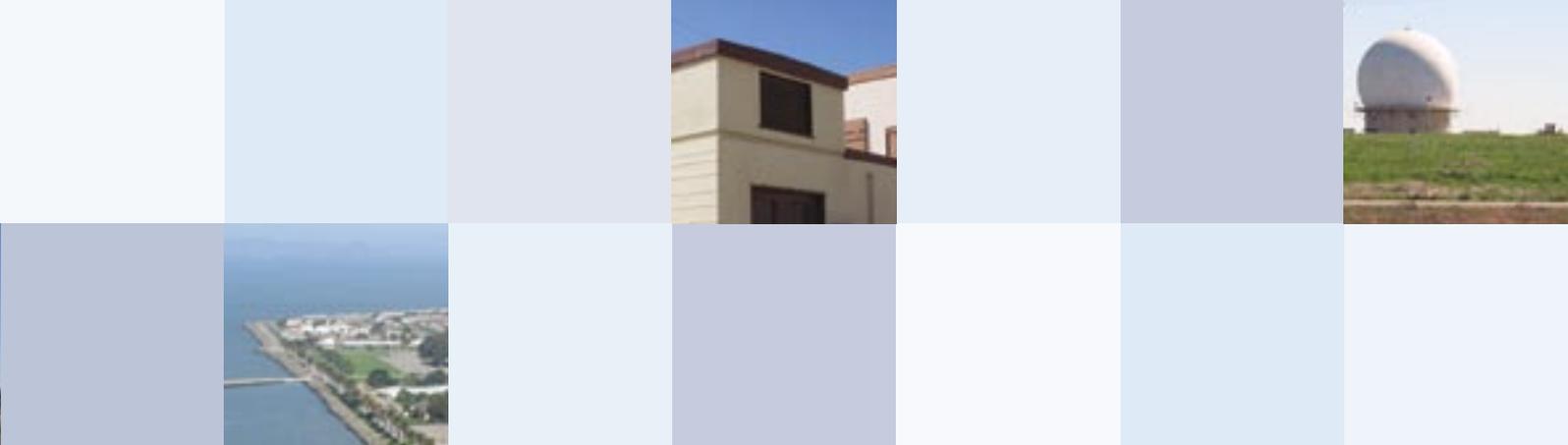
The sheer age of the facility and the variety of land uses make environmental characterization difficult. Repeated dredging of the Mare Island Strait provided enough sediment to expand the original 956-acre² island to 5,600- acres today.

Environmental contamination of the island was caused by construction, maintenance and repair of naval vessels, including nuclear submarines, the manufacture and storage of munitions, and other industrial activities. These activities included metal plating, lead acid battery refurbishing, oil handling and reclamation, abrasive blasting, handling leaking transformer oil storage tanks, discharge of waste water to Mare Strait, landfill disposal of solvents, PCBs, asbestos, and other wastes, land disposal of contraband and miscellaneous MEC, trinitrotoluene (TNT), and mercury, and detonation of waste ordnance. Contaminants include volatile organic compounds, solvents, PCBs, TNT, mercury, MEC, metals, lead and other hazardous substances.

Two types of contamination at Mare Island Naval Shipyard posed the most immediate

¹ Naval Facilities Engineering Command. *Mare Island Naval Shipyard*. 23 Feb 2004. <http://www.efdsww.navfac.navy.mil/environmental/MareIsland.htm>. Online. 8 Aug 2004.

² Ibid.



threat to reuse and redevelopment of the island: radiological contamination and MEC. DTSC worked with the Navy and other State and federal agencies to address these two concerns as quickly and safely as possible.

Closure of Mare Island was defined by the termination of the nuclear licenses held by the installation, which was dependent upon DTSC concurrence with the radiological clearance. The Navy spent \$130 million on an extensive survey for radiological contamination. The Navy remediated any contaminated areas to background levels. DTSC personnel worked diligently to review and sign-off on the radiological survey in order to meet the Navy's timelines. Regulatory agencies and the Navy assured the community that radiological problems had been addressed properly using a very public process, through extensive site characterization and remediation of any areas with radiological concerns. This was the first time regulatory agencies and DoD successfully completed radiological investigation and cleanup of a former military base.

With more than 150 years of ordnance manufacture, storage and disposal at Mare Island Naval Shipyard and Mare Island Strait, MEC was a serious concern. The Navy Explosives and Ordnance Detachment conducted MEC investigation and remediation throughout the early 1990s. Regulatory agencies and DoD had not yet dealt with significant MEC investigation and remediation, so the technical framework for MEC site assessment work had to be defined. The technical framework used to investigate and remediate MEC at Mare Island in the

mid-1990s is considered insufficient by today's standards; however, a significant amount of MEC was removed for the portions of the property that have been transferred, thus reducing risk to humans and the environment.

Because investigation and remediation will occur simultaneously, the challenge is to protect the public by preventing exposure to potentially hazardous areas without impacting use of the base for economic development. Fencing, warning signs, locked doors and gates, monitoring, education and communication programs, and security patrols have been used to prevent exposures to people who work, visit or attend school at the base.

The two parcels transferred by Early Transfer include: the Eastern Early Transfer Parcel, an 860-acre parcel transferred to Lennar Communities, a major development company, through the City of Vallejo, with an environmental cleanup contract issued to CH2MHill; and the Western Early Transfer Parcel, and an approximately 4,800-acre parcel transferred to the State Lands Commission.

The Western Early Transfer Parcel consists of submerged lands, wetlands and dredge ponds. Weston Environmental Solutions plans to lease the dredge ponds for the deposition of dredge spoils from around the Bay Area. Institutional controls detailed in the Remedial Action Plan restrict use due to the possibility of MEC and elevated levels of metals.

Though conflicts between investigation or remediation and reuse or redevelopment are inevitable, the active reuse at Mare Island is a testimony to DTSC's desire to quickly and



Confirmed Site 10 tent, designed to allow remediation of landfills to occur year-round.

efficiently meet the reuse and redevelopment needs of the community, while protecting the public and the environment. Mare Island will undergo extensive restoration and redevelopment for light industrial, commercial and residential uses.

McClellan Air Force Base

Having once been the largest employer in Sacramento County, McClellan Air Force Base is on track to once again be an economic generator for the Sacramento region. McClellan Air Force Base, which served as a maintenance depot for aircraft and electronic equipment, was slated for closure during the 1995 BRAC round with operational closure in 2001. McClellan Air Force Base is also listed on the NPL.

Because of the heavy industrial uses of the installation for aircraft and electronic equipment maintenance, McClellan is arguably the most contaminated property to be closed or realigned by DoD. Due to the types and severity of contaminants identified, including organic solvents, PCBs, PAHs, metals, pesticides, and radioactive compounds, the base has become the most expensive cleanup in the BRAC inventory.

During the 1950s, military aircraft would fly through nuclear blasts around the world to collect air samples. These aircraft would return to McClellan, where the planes were rinsed off on the tarmac. The water would run off the planes, onto the tarmac and to the surrounding soil, resulting in low-level radioactive contamination in the soils.

Due to the extensive contamination, transfer in deed of the property has been slow, though all of the base's 2,952 total acres have been leased to the County of Sacramento. Some portions of the base have transferred in deed; most notably, the nuclear reactor located on base transferred to the University of California Davis Medical Center. A planned sewer improvement project at the base has initiated the Early Transfer process for property on the sewer line, and the former Defense Reutilization and Marketing Office warehouse area is slated for transfer to begin the McClellan "gateway development" project.

During investigation of one of the base landfills, a laboratory vial of plutonium was discovered, which caused intense public and media scrutiny of the cleanup actions for the installation. The resulting remedial action for the landfills is to complete an archeological-type removal of landfills beneath the massive Confirmed Site 10 tent. The tent allows remedial activities to continue year-round, regardless of weather conditions at the site.

One successful method employed in the remediation of McClellan was to establish criteria to evaluate and rapidly install soil vapor extraction treatment systems for removal actions at contamination sources. This helped prepare concise and timely removal action documents and facilitated the removal of many sources right away. More than two million pounds of volatile organic compounds have been removed from the soil and groundwater, mostly by the soil vapor extraction systems.



Main soil vapor extraction system at McClellan.

This success was accomplished through a combined, cooperative effort between the State, U.S. EPA and the Air Force.

McClellan was the third base in Sacramento to close, following Mather Air Force Base and Sacramento Army Depot, compounding the economic impact on the region. To recover from the loss, the County of Sacramento and their development partner, McClellan Business Park, have worked to bring in new jobs and employers to the area. McClellan Park has seen significant success in its reuse activities, with more than 3,800 new jobs created on the base since closure.

Oakland Army Base

Located at the foot of the San Francisco-Oakland Bay Bridge, Oakland Army Base operated as a hub for sea, rail and land transportation of military personnel and materiel for the Army from 1941 until its operational closure in 1999. Closure of Oakland Army Base meant the loss of 1,749 civilian jobs, but it also made 366 acres of excess property at the foot of the Bay Bridge available for redevelopment.

During its operation as an Army installation, Oakland Army Base conducted equipment maintenance, vehicle shipment, fuel storage, waste management, cleaning operations, railroad rolling stock and trackage, trucking, and wharf and warehousing operations. Contaminants identified or suspected at the site include metals, volatile organic compounds, semi-volatile organic compounds, and petroleum hydrocarbons.

Recognizing an opportunity for significant and positive change, the City of Oakland decided to take a “brownfields approach” in its reuse plans using concurrent investigation, remediation and redevelopment. Because the property would undergo transfer of ownership before all contamination had been addressed, the requirements of an Early Transfer would apply.

The City of Oakland hired environmental consultants and attorneys who designed a Risk Management Plan that established procedures to handle development while simultaneously completing the remedial investigation. The Risk Management Plan established protocols for addressing known and unknown contaminated areas, so that investigation will occur as development proceeds. Seven investigation and remediation sites were identified as the primary contamination sites, and were the first in line for cleanup. As development proceeds, DTSC staff focuses on the nature of the contamination and the mechanisms to address such contamination. Agreements and LUCs negotiated and signed between DTSC, the City of Oakland, and the Army addressed these issues.

The Remedial Action Plan for Oakland Army Base was finalized in September 2002, and the property transfer was signed in August 2003. The estimated cost of cleanup is \$20-21 million; the Army contributed \$13 million and purchased an environmental insurance policy to cover costs more than \$21 million. The City will fund the remaining cleanup costs. An Environmental Services Cooperative Agreement between the Army and



The historic buildings at the Presidio of San Francisco adjacent to the landfill removal area planned for stream restoration.

the City of Oakland provided for the funding and terms of agreement.

The Army, DTSC and the City of Oakland signed a covenant that restricts “sensitive uses,” prohibits extraction of groundwater, requires site management protocols according to the Remedial Action Plan and Risk Management Plan, and requires annual certification showing compliance with the covenant.

Federal investments in planning and infrastructure for the redevelopment of Oakland Army Base exceed \$5.8 million. The City of Oakland will develop 133 acres as its “gateway development” area, a mix of commercial and industrial development planned for the foot of the Bay Bridge. The Port of Oakland will develop 233 acres for maritime, rail, and other port activities. As of October 2003, Oakland Army Base had approximately 50 tenants in its adaptive reuse program employing 750 people. Various non-profits, educational organizations and private companies occupy the base. A homeless shelter, an athletic club, a mental health clinic, warehouse facilities and port activities are all a part of the reuse. Future development plans include expansion of the Port’s marine cargo facilities and a commercial development area near the end of the Bay Bridge, creating an estimated 8,000 jobs upon build-out.

Upon clarification of the Early Transfer method and requirements and the use of a “brownfields approach,” the transfer process and redevelopment could move forward. Competent and effective environmental consultants

working for the City made the transfer go more smoothly. Assurances, in the form of LUCs and the risk management plan, provided that the concurrent investigation, remediation and redevelopment would protect public health and the environment.

Presidio of San Francisco

With views of the Golden Gate Bridge, the Pacific Ocean and the San Francisco Bay, the Presidio of San Francisco has become one of the crown jewels of San Francisco. Its importance to history began first as a Spanish military post from 1776 to 1821, when Mexico gained its independence, and then as a U.S. Army post after the U.S. Army took control of the Presidio in 1846 during the Mexican-American War.³

Marked by preserved historic buildings and national park status, its landscape has been memorialized by the writings of author Jack London. And, after more than 200 years of continuous use, the Presidio of San Francisco is transforming from Army post to National Park.

Through unique and creative actions by the United States Congress, the Presidio of San Francisco transferred ownership directly from the Army to the Presidio Trust, a government corporation, and the U.S. Department of the Interior. The Army donated the land along the shoreline to the National Park Service. The Trust and the U.S. Department of Interior negotiated a settlement with the Army for \$100 million for cleanup activities and an additional \$100 million insurance policy. DTSC has post-transfer, lead-agency

³ Presidio Trust. *The Presidio through Time*. 2003. http://www.presidio.gov/About_the_Presidio/PresidioHistory/. Online. 13 Aug 2004.



Crissy Field was once an Army airfield but is now a tidal salt marsh.

responsibilities through a cleanup oversight agreement with the U.S. Department of Interior and the Presidio Trust.

Compared to bases with a history of significant heavy industrial activities, the Presidio has relatively low levels of contamination. Contamination levels are in many cases below human health risk, and portions of the post will be cleaned to more protective standards to protect plants and animals as part of the natural habitat restoration efforts at the Presidio.

However, the Presidio of San Francisco is not without its environmental concerns. The most widespread contamination at the Presidio is from petroleum, with 9.5 miles of underground piping throughout the post.

Additional contaminants identified include lead, asbestos, pesticides, metals and PCBs. Contamination likely resulted from several historical uses. DDT showers were once used to kill pests on troops returning from overseas, resulting in pesticide leaks. Rubble from the 1906 earthquake was dumped in the marsh along the Bay to form Crissy Field. Various sites scattered throughout the post were used for landfills. Serpentine rocks, which exist throughout the post and form the bluffs overlooking the Pacific Ocean, may contain naturally occurring asbestos.

Cleanup plans for the post include contaminated area removal, treatment of soil gas, and groundwater monitoring and treatment. The Tennessee Hollow watershed restoration will restore a natural spring and creek; watershed restoration efforts will

require the \$16 million removal of a PCB-contaminated landfill. The Remedial Action Plan for Crissy Field was signed in 1998, which included native plant restoration and restoration of the tidal marsh.

The Presidio Trust plans significant natural habitat restoration for the area, and much of the land will be used for recreation, habitat and open space.

Conflicts between historic preservationists, interested in preserving the historical character of the post, and environmentalists, interested in natural habitat restoration, have made remediation and restoration planning a challenge. For example, during remediation of Inspiration Point, the area where mustard gas agent was found, eucalyptus trees had to be removed. While eucalyptus trees are not native to California and would thus not be included in native habitat restoration plans, Jack London wrote about the eucalyptus trees at the Presidio in 1943, so historic preservationists worked to have eucalyptus trees re-planted after remediation.

Future commercial use will include digital arts studios under the ownership of film director George Lucas, reuse of historic residential areas, and reuse of hospital areas, including redevelopment of the Public Health Services Hospital into affordable senior housing.

Those responsible for the cleanup of the Presidio have made a concerted effort with available funds for remediation and restoration. With a shared focus on restoring and protecting the Presidio, the team comprised of DTSC,



View of the Pacific Ocean and the inlet to the San Francisco Bay by way of Battery Crosby, a former Army guard post.

RWQCB, Presidio Trust, U.S. EPA, and Army staff, as well as an active community, has been successful in rebuilding the history and restoring the environment of the Presidio.

The remediation, restoration and redevelopment of the Presidio of San Francisco have created a showcase for the coexistence of historic preservation and environmental restoration.

Sacramento Army Depot

Before its closure during the 1988 BRAC round, Sacramento Army Depot repaired, modified and rebuilt of electronic, optical, and communication equipment between 1946 and 1995. These industrial activities resulted in contamination by heavy metals, pesticides, volatile organic compounds, and PCBs. Remedial activities included excavation and solid stabilization of soil contamination on site and groundwater extraction and treatment. Land use covenants on the site restrict residential use in one area, protect the integrity of a waste disposal area, and preclude drilling into and using the underlying contaminated groundwater.

As of March 2003, 430 of the 485 total acres at the Depot have transferred from the Army to the City of Sacramento. In its adaptive reuse program, the Sacramento Army Depot is operated as a secure facility. Unlike many closed military bases, the gates and fences at the Depot are used as a marketing tool for prospective tenants concerned about security. Much of the space has been leased, and the reuse program has created 1,700 jobs.

Sierra Army Depot/ Honey Lake

Honey Lake, located in the high desert at the foot of the Sierra Nevada Mountains in Lassen County, served as an aerial bombing and gunnery range from 1933 until Sierra Army Depot underwent realignment during the 1995 BRAC round. Until closure in 2000, Honey Lake was used for aerial target training by Army pilots and for detonation of excess munitions. As a result, the area may be contaminated with lead, perchlorate, and explosives residues.

The 57,632-acre Honey Lake parcel, along with other parcels together totaling 64,000 acres, transferred from the Army to the Center for Urban Watershed Renewal under the newly-developed conservation conveyance mechanism in September 2003. The Honey Lake Conservation Team, made up of the Center for Urban Watershed Renewal, the Trust for Public Lands, Baker Engineering and Energy and Bio Engineering Group, will undertake the remediation and restoration of Honey Lake. The Honey Lake transfer constituted the first major conservation conveyance in the United States.

Stockton Naval Computer Station

Stockton Naval Computer Station (NCS) operated as an inland communications center and port for the U.S. Navy from 1944 to 2000. It is located on Rough & Ready Island, which is connected to the San Francisco Bay by a 78-mile-long deep-water channel. The



Aerial view of Rough & Ready Island.

Navy used the property as a supply depot and communication station until supply operations ended in the early 1960s, and its warehouses were leased to private entities. The Communication Headquarters was relocated and operations phased out. Stockton NCS closed in 1996 through special legislation.

Areas of environmental concern at Stockton NCS included landfills, a burn dump area, a battery acid disposal area, a firefighting training area, damaged container storage area (where paints, thinners, solvents, DDT, and other materials were stored), a pesticide storage building, sump areas, and equipment maintenance pits. Industrial activities left behind pesticides (primarily DDT), waste oils, chlorinated and non-chlorinated solvents, metals, PCBs, and petroleum.

At the time of property transfer, the Navy had not yet completed the remedial investigation and had not yet selected the remedy for the Early Transfer parcels. Possible remedies for any contamination found on-site include waste removal, capping of landfills, groundwater extraction and treatment, or long-term monitoring.

The Navy initially wanted to cleanup the landfills on Rough & Ready Island for use as a nature preserve and wetlands area, using the presumptive remedy of a landfill cap. DTSC argued that the presumptive remedy would not work for Stockton NCS because wastes were segregated into 15 cells, not mixed as at municipal landfills, and further investigation would be required. In fact, a nature preserve and wetlands would actually require more

stringent cleanup standards than industrial use for expansion of the Port of Stockton, as is its current planned reuse.

To alleviate DTSC's concerns, the Port of Stockton and the developer, Titan Investment, set aside money to design and operate the parking lots onsite as caps in a "brownfields" cleanup approach.

Property transfer of Stockton NCS occurred in three phases. The first two transfers of clean property occurred through a Finding of Suitability to Transfer in June 2000 and July 2002. Potentially contaminated portions of a third property transferred through Early Transfer in September 2003, with the Navy retaining responsibility for "unknown" site conditions, MEC, and biological and radiological contamination. The Early Transfer documents also included an enforceable agreement between the State agencies and the Port of Stockton, with timetables and description of remediation activities. The Port is obligated to fund remediation activities under a Consent Agreement according to the Environmental Services Cooperative Agreement.

A temporary LUC prohibits residences, schools, daycare centers, and any other uses that disturb the investigation and remediation of the site. The LUC will terminate when the State determines that all remedial actions have been completed and no further action is required.

Congress closed Stockton NCS by special legislation outside of the BRAC process, so



funds for cleanup did not have to come from BRAC accounts. This alleviated funding concerns often associated with environmental cleanups on former military bases.

Environmental insurance was also an important part of the property transfer. The Navy purchased an insurance policy to cover any cost overruns, which, when combined with the funding by the Navy, provides \$40 million for cleanup.

The former Stockton NCS will undergo a dramatic commercial and industrial redevelopment. The Port of Stockton has signed a 50-year lease with Titan Investment for expanded port operations, including automobile import and export facilities, container facilities, break-bulk facilities, and intermodal rail transfer facilities. With the addition of the former Stockton NCS property, the Port of Stockton will more than double in size and capacity.

Stockton has become an important port to the auto import industry and others, which have been pushed out of coastal ports by the container industry. Stockton will soon be home to Ford Motor Company's imports from manufacturing operations in Australia and for other shipping companies that use intermodal transportation facilities.

More than 1,000 jobs will be created by Port expansion, and a \$600 million investment by the developer will bring needed economic growth to the area. Without the Early Transfer, the investment opportunity would not have been feasible.

Tourtelot Property/Former Benicia Arsenal

The 220-acre Tourtelot property, within the 2,700-acre former Benicia Arsenal, in Solano County, is a high-profile MEC cleanup project in a new housing area. The Benicia Arsenal operated for 100 years as a depot for munitions storage, issuance and transshipment. The Tourtelot property was leased to the Army from 1944 to 1960 for arsenal-related activities including artillery testing and explosives disposal, and demolition of damaged, obsolete and confiscated munitions.

The site developers, Granite Management Corporation and Pacific Bay Homes, discovered MEC issues at the Tourtelot property in 1996 when howitzer shells and live ordnance were discovered onsite. Finding MEC on a planned residential site can be devastating because MEC areas almost always have land use restrictions even after remediation.

However, through an aggressive MEC clearance and remediation process, DTSC worked with the City of Benicia, Pacific Bay Homes and the Army Corps of Engineers to ensure that the property would be safe for residential development. Combined with an extensive public participation campaign, the technical clearance and remediation methods, including multiple scans and clearances, and sieving of the soil, the Tourtelot project has arguably been one of the most successful MEC cleanup projects in the State. More than 4,000 MEC items have been removed from the site and were destroyed in a blast chamber



View of Treasure Island from atop Yerba Buena Island.

or by other methods. The remediation was completed and the site was certified by DTSC in June 2004.

Treasure Island Naval Station

With fantastic views of the San Francisco skyline and an urban island ambiance unmatched by other locations, Treasure Island is moving into its third incarnation: from the site of the 1930s World Exhibition to Treasure Island Naval Station to future residential neighborhood and commercial core. Located in the San Francisco Bay along the span of the Bay Bridge, Treasure Island, a 404-acre man-made island built in the 1930s, and Yerba Buena Island, a 147-acre natural island, became Treasure Island Naval Station in the 1940s.

The Navy primarily used Treasure Island for training and administrative activities. Sources of contamination at Treasure Island include a medical clinic, foundry, boiler plant, bunker, storm water outfalls, refuse transfer area, auto hobby shop, oil recovery waste facility, seaplane maintenance shop, service station, hydraulic training school, painting shop, storage shed areas, landfill, and fire and fuel-tank release training. Contaminants identified include low level radioactive waste, PCBs, pesticides, paints, waste oil and fuel, solvents, asbestos, acids and heavy metals.

The most significant contamination is found at Site 12, the former landfill area, which is now a housing area. Some portions of the housing area have PCB concentrations as high

as 160,000 parts per million; in other words, 16% of the soil was made up of PCBs in some areas. The contaminated soil has been removed from around the buildings, and further remediation will be necessary when the buildings are demolished.

Remediation and redevelopment of Treasure Island are complicated by the possibility of liquefaction or instability of soils caused by an earthquake, which can cause possible migration of contaminants to the San Francisco Bay.

Nearly 100% of the Treasure Island property has been leased to the City of San Francisco for a variety of uses, including movie production, an elementary school and daycare center, approximately 750 rental housing units, and an Olympic sailing school at Clipper Cove.

In late December 2002, the City of San Francisco initiated Early Transfers of remaining Navy property at Treasure Island not yet suitable for regular transfer. An Environmental Services Cooperative Agreement will be negotiated between the City of San Francisco and the Navy. DTSC requested that the Navy complete investigation and alternative remedy analysis to the extent that likely remedy can be determined and associated costs of cleanup can be estimated before Early Transfer.

The progress at Treasure Island is due, in large part, to the close coordination and effective teamwork of the base cleanup team. The team established a standard format for all documents, which has allowed for faster



A view of the San Francisco skyline and the Bay Bridge from Yerba Buena Island.

document review. The team conducts meetings to present comments verbally for document revisions instead of going directly to formal comments on some occasions, although formal comments are still presented.

Future redevelopment of Treasure Island includes residential neighborhoods with 2,800 housing units and a commercial core.

Tustin Marine Corps Air Station

Originally a “lighter-than-air” base for U. S. Navy blimp aircraft, Tustin Marine Corps Air Station later became the Marine Corps’ main training facility on the West Coast for medium- and heavy-lift helicopters. Tustin Marine Corps Air Station opened in 1942 and closed in 1999.

Located within bustling Orange County, Tustin Marine Corps Air Station and the nearby El Toro Marine Corps Air Station, contain some of the last remaining undeveloped, open space in Orange County. Available land in the area is in short supply, and demand for housing and commercial development is high. The property at Tustin is highly valuable.

During military operations, aviation maintenance, fueling activities, and gas station operation were the primary sources of contamination at Tustin. Contaminants include volatile and semi-volatile organic compounds, petroleum hydrocarbons, arsenic, and metals.

The Navy selected on-site thermal treatment for petroleum contaminants in the soil, and

extraction and treatment with granulated active carbon for groundwater contamination. In addition, the Navy conducted a time-critical removal action to prevent contamination of the region’s groundwater. The removal action has treated 6.5 million gallons of water and removed approximately 4.85 pounds of volatile organic compounds from the groundwater. At the former gas station, the Navy removed soil to a depth of 25 feet and backfilled the area with clean soil. Tustin had three RCRA-permitted units, each of which has been closed with no residual contaminants.

The Tustin property transferred to the City of Tustin, the County of Orange and others through a series of transfers either after property was determined to be clean or after the selected remedy was determined to be Operating Properly and Successfully. Property was conveyed by Economic Development Conveyance, Public Benefit Conveyance and public bid sale. In the public bid sale, Lennar Communities purchased 200 acres for \$208 million, or just over \$1 million per acre. Proceeds of the sale paid for environmental remediation at Tustin and other Navy installations. An additional 1,100 acres transferred in 2002 to the City of Tustin, approximately 50 acres of which were sold to John Lang Homes for \$60 million. The property was released with a LUC restricting drilling and use of groundwater for drinking water.

One unique feature of the demolition of existing structures on Tustin is that nearly everything from the base is being recycled.



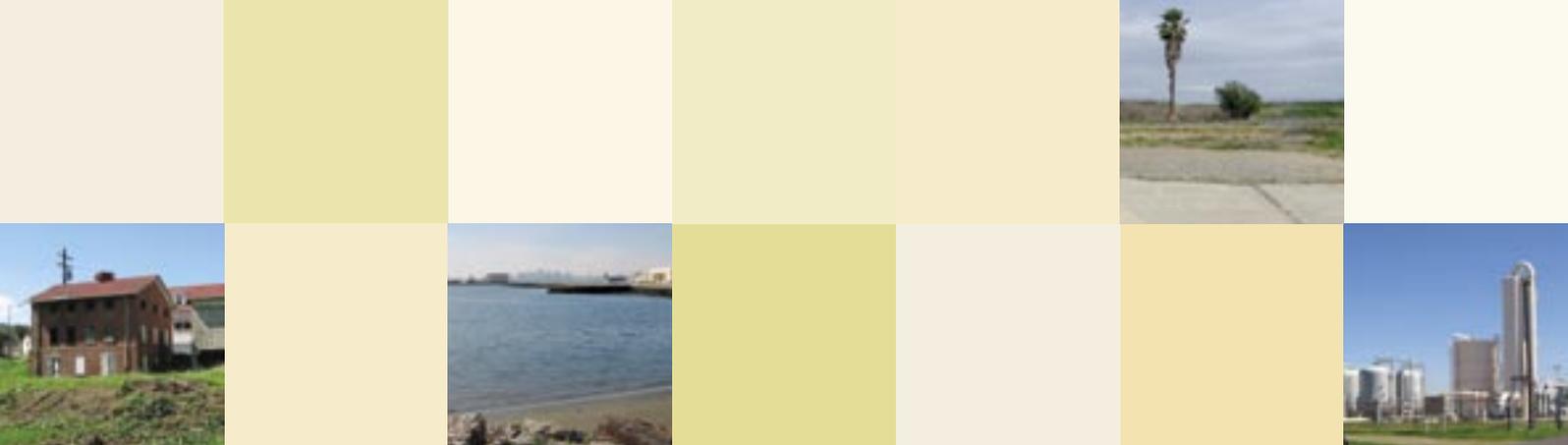
Habitat for Humanity is acting as a partner to Lennar Communities on the public bid sale parcels. They collect and distribute reclaimed tile, air conditioning units, doors, windows, and other building materials from the former base housing. The materials will be used in construction of housing in underserved areas in the U.S. and abroad. Upon build-out, the Lennar Communities property will have 1,800 homes, with additional homes constructed on the John Lange property.

The Orange County Rescue Mission Village of Hope, a family education, training and housing facility, and the first of its kind, completed renovation and construction of the former barracks. Additional improvements were made by Lennar Communities, the master developer of the site, in exchange for use of office space during construction.

A former landfill site has been capped beneath a roadway system by the California Department of Transportation, and was

recently given the Operating Properly and Successfully designation by DTSC and U.S. EPA. The Navy installed a concrete retaining wall, soil cover and the roadway as caps for the landfill.

Tustin has two enormous blimp hangars, each 200 feet tall, 300 feet wide and 1,000 feet long. One of the blimp hangars belongs to the City of Tustin, which will likely be demolished, and one belongs to the County of Orange. The County has plans in the works for its hangar as a location for various recreational facilities, possibly including an indoor ski area. The airfield tarmac, aircraft parking aprons, and runway will likely be demolished to make way for a 100-acre, big-box retail area. Three community college districts received property through the Public Benefit Conveyance. The resulting development at the former Tustin Marine Corps Air Station will then include residential, commercial, education, recreation and open space development.



Abbreviations and Acronyms

BRAC	Base Realignment and Closure	LUC	Land Use Covenant
Cal/EPA	California Environmental Protection Agency	MEC	Munitions and Explosives of Concern
CEQA	California Environmental Quality Act	NPL	National Priorities List
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	OMF	Office of Military Facilities
DSMOA	Department of Defense and State of California Memorandum of Agreement	PAHs	Polynuclear Aromatic Hydrocarbons
DoD	Department of Defense	PCB	Polychlorinated Biphenyl
DTSC	Department of Toxic Substances Control	RWQCB	Regional Water Quality Control Board
DDT	Dichlorodiphenyltrichloroethane	RCRA	Resource Conservation and Recovery Act
FISCO	Fleet Industrial Supply Center Oakland	RI/FS	Remedial Investigation and Feasibility Study
FUDS	Formerly Used Defense Sites	SARA	Superfund Amendments and Reauthorization Act of 1986
HAAF	Hamilton Army Air Field	TCE	Trichloroethylene
HRC	Hydrogen Release Compounds	TNT	Trinitrotoluene
		U.S. EPA	U.S. Environmental Protection Agency

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