Winter 2003 ❄

# RPM News

▲ Remedial Project Manager News ▲

"Communicating Navy Installation Restoration Program News and Information Among All Participants"

## In This Issue



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| Spring 2004 | January 30 |
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**RPM NEWS**

Remedial Project Manager News

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**NFESC**

NAVFAC

**Using Appropriated Funds**

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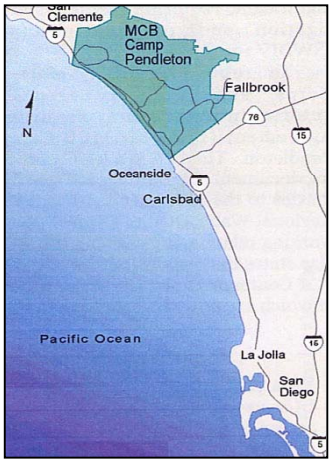
# BACK TO THE BASICS: REGULATORY PARTNERSHIPS THROUGH TRAINING

The Department of the Navy (DON) spearheaded a unique approach to progressing towards agreement on numerous controversial sites: basic training. The DON sponsored a two-day training session focused on the basics of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) specifically for members of the entire Marine Corps Base (MCB) Camp Pendleton cleanup team. The results of this simple, yet underutilized, technique were surprising.

## The Facility

MCB Camp Pendleton was established in 1942 to provide training facilities and support for the Fleet Marine Force Units. The Base, which supports a daily population of about 60,000, occupies approximately 125,000 acres along the Pacific Ocean midway between San Diego and Los Angeles, California. Southwest Division (SWDIV), Naval Facilities Engineering Command (NAVFAC) manages MCB Camp Pendleton's Installation Restoration (IR) Program.




## The Need

A Federal Facilities Agreement (FFA) exists for MCB Camp Pendleton's IR Program. Parties to the FFA include the U.S. Environmental Protection Agency (EPA), the California Department of Toxic Substances Control (DTSC), the California Regional Water Quality Control Board (RWQCB), and the Navy and Marine Corps (N&MC). Though frequent communication occurred, the members had reached an impasse on several key sites. The FFA team discussed the same issues repeatedly at each meeting, yet they failed to reach agreement due to fundamental differences in interpretation of guidance. In order to realize progress, the DON decided to dedicate the May 2003 monthly FFA technical meetings to reviewing CERCLA processes, policies, and guidance.

## The Training

The title of the training precisely stated its purpose: "Enhancing Project Execution: Baseline CERCLA." Three elements of the training rendered it a complete success: the attendees, the topics, and the presenters.

The DON realized that in order to avoid pitfalls experienced during regular FFA meetings, meeting participants required expansion; a greater audience would increase uniform understanding among a larger, yet common, group. Attendees included supervisors, contractors, technical experts, legal representatives, and representation from other FFA teams in addition to Remedial Project Managers (RPMs).

Attendees of Baseline CERCLA

The agenda topics also contributed to the training's success. The training specifically focused on informing and clarifying subjects of concern, especially those with recurring frequency in FFA discussions and comments. Topics included: a CERCLA overview; land use controls; risk-based cleanup; Applicable, Relevant, and Appropriate Requirements (ARARs); five-year reviews; and the Petroleum Exclusion Rule. The subjects were well received and sparked extensive as well as constructive discussions.

The presenters were the most crucial element to the training's success. The DON exercised extreme care in choosing unbiased, balanced speakers and obtained instructors deemed experts in their subject areas from all FFA parties. More importantly, however, the DON ensured the training was not biased from the Navy's perspective. Navy presenters had no knowledge of specific issues, so partiality was non-existent.

*Topic on Five-Year Reviews*

## The Results

"Basic training" seems like a simple step that might not produce significant impact. The MCB FFA Team, however, found the opposite. Within two months after the training, the MCB FFA Team realized impressive results.

The FFA Team reached expeditious agreement on a closed landfill site as a result of the CERCLA Overview. Soon after the training, an issue arose regarding increased methane levels. During the training, NAVFAC counsel explained the Navy funding process and clarified that increased expenditures on one MCB site result in fewer expenditures on another. When the landfill issue arose, each member of the Team realized the need for balance between judicious expenditure of funds while ensuring protection of human health and the environment. The Team quickly reached concurrence on follow-on actions, whereas months would have previously been required to reach agreement.

The ARARs presentations given by the RWQCB and the Navy affected the Operable Unit (OU) 4 Supplemental Feasibility Study (SFS); the DON received few comments on the document. During the presentations, both the RWQCB and Navy relayed information on processes and requirements for each entity. Team members realized differences in specified ARARs resulted from policy. Previously, volleys of written comments, conference calls, and months for resolution ensued simply to iron out differences in understanding of policy. However, the Team found the OU4 SFS required fewer comments due to increased understanding. Expeditious completion of the document will ultimately be achieved.

*NAVFAC Counsel*

Aside from specific issue resolution, numerous intangible results were gained. Training increased harmony among Team members. While formal partnering had previously been helpful, Team members began thinking the group was somehow "dysfunctional." Training allowed members to realize they worked well; the only problem was difference in interpretation. As a result, the DON received glowing comments on several OU 3 closure reports. Lastly, the basic training avoided countless hours and dollars taken up by issue resolution and will bring numerous sites at Camp Pendleton to timely closure.

## Point of Contact

*For more information, contact:*
*(619) 532-4168*

## TRACKING THE EFFECTIVENESS OF ENHANCED ANAEROBIC DECHLORINATION

### Introduction

Anaerobic dechlorination has been used to cost-effectively clean up dissolved phase chlorinated compounds present in groundwater at many Department of Defense (DOD) and Navy sites. The process of reductive dechlorination is used to degrade chlorinated compounds, such as tetrachloroethene (PCE), trichloroethene (TCE), and 1,1,1-tricloroethane (TCA) into harmless end-products such as ethane and ethene. This process occurs naturally, but can also be enhanced through the addition of substrates into the subsurface to stimulate microbial growth (see Figure 1). There are currently over 700 DOD sites and 450 Navy sites impacted with chlorinated compounds in groundwater and several of these sites could be amenable to enhanced anaerobic dechlorination.

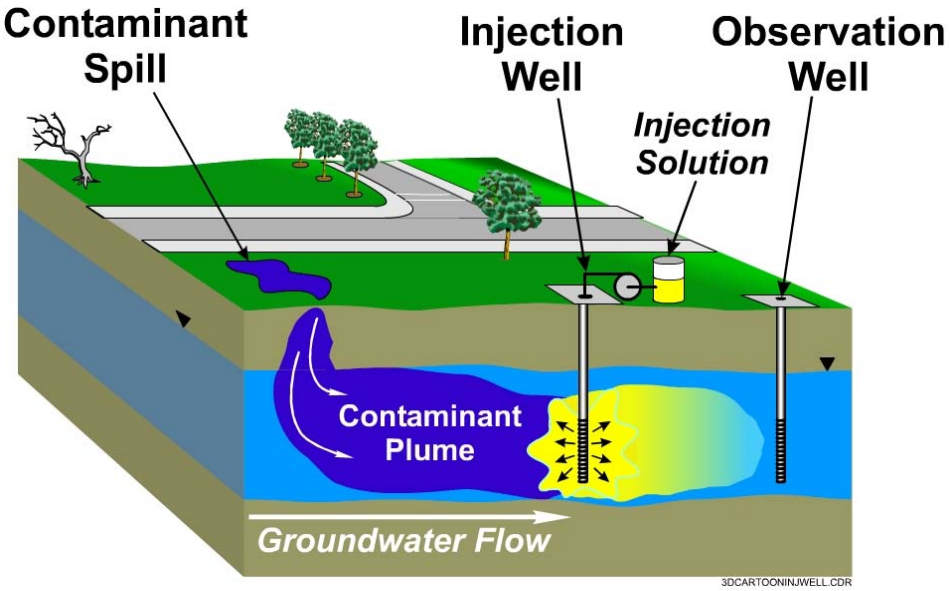



**Figure 1. Enhanced Dechlorination**

### Project Description

The Naval Facilities Engineering Service Center (NFESC) and DOD Environmental Security Technology Certification Program (ESTCP) have partnered to conduct a survey of publicly available documents and site information to accomplish the following objectives:

- Examine the state-of-the-art of enhanced anaerobic dechlorination technologies,
- Conduct a comparative analysis of the survey results, and
- Produce a report providing guidance on how to ensure effective application of the technology.

This DOD ESTCP project will be conducted in two parts; the site survey as part one, and the development of a joint guidance document as part two. The site survey was completed in October 2002 and is available via this link: Evaluation of Performance and Costs Associated with Anaerobic Dechlorination Techniques (CU-0125). The report can also be found under final cleanup reports on the ESTCP web page: http://www.estcp.org/documents/techdocs/index.cfm. The Principles and Practices of Enhanced Anaerobic Bioremediation guidance document is scheduled for release in March of 2004.

### Survey Results

The site survey involved the completion of a literature and site review that focused on collecting available information on the current practice of applying enhanced anaerobic dechlorination technologies. This technology status survey compares several alternative approaches for applying enhanced anaerobic dechlorination and compares the efficacy of these approaches under various site conditions.

The survey includes data from 93 sites including information on the contaminants of concern; the type, cost, and effectiveness of the selected substrate; the type of impacted media; the application technique; the aggressiveness of treatment; any regulatory concerns; and the life cycle costs. The majority of sites surveyed had groundwater impacted with chlorinated ethenes. The most frequently used substrates were hydrogen release compound (HRC®) (35 sites), molasses (15 sites), lactate (14 sites), and edible oils (10 sites). Other substrates used included butyrate, acetate, fructose, lactose, methanol/acetate, ethanol, sodium benzoate, mulch, chitin, and hydrogen.

While approximately 12 sites have reached groundwater cleanup objectives and closed, the performance of enhanced anaerobic dechlorination is still under evaluation at a majority of the surveyed sites.

### Conclusions

The survey results and the future guidance document will provide a valuable resource to Navy remedial project managers (RPMs) considering this remedial approach and could promote significant cost avoidance during project implementation. This survey will allow RPMs and other decision-makers to make more informed choices about which substrate has the potential to be the most cost- and performance-effective at their site. Watch the NFESC web site for an announcement regarding the release of the guidance document!

### Point of Contact

*For more information on this on-going project, contact:*
*(805) 982-4990*

# Enhanced Natural Attenuation of Commingled Plumes

At least 1,000 Department of Defense (DOD) sites may be impacted by the combined presence of chlorinated solvents and fuel hydrocarbons in groundwater. These commingled plumes often occur as the result of fire-fighting training activities, co-disposal in unlined lagoons, leaking tanks at adjacent sites, and other releases. In fact, over 222 commingled plumes have been identified at Navy sites that are still in the remedial investigation phase and are just now entering the cleanup phase of the Installation Restoration (IR) process. For sites of this type, enhanced natural attenuation of commingled plumes (ENACP) may prove to be a quick and cost-effective remedial approach for the cleanup of moderately contaminated groundwater.

The ENACP technology was recently demonstrated at the pilot-scale by the Naval Facilities Engineering Service Center (NFESC) and Stanford University at Moffett Federal Airfield in California. At this site, the addition of an electron donor accelerated the natural attenuation processes so that cis-dichloroethylene (*cis*-DCE) concentrations were reduced by more than 95% and vinyl chloride (VC) concentrations were reduced by more than 58% during a brief two-month demonstration period. This article provides background information on the behavior of commingled plumes and the use of the ENACP technology. A brief summary is also provided of the Moffett Field demonstration results, along with an overview of the advantages and limitations associated with this remedial approach.

## Commingled Plume Behavior

Commingled groundwater plumes typically contain chlorinated solvents such as perchloroethylene (PCE) and/or trichloroethylene (TCE) as their principal components, along with water-soluble fractions of gasoline, jet, and/or diesel fuels. It has been found that the presence of fuel hydrocarbons can promote the attenuation of chlorinated solvents through a series of microbial interactions. First, the fuel-related hydrocarbons are readily attenuated by microbes that rapidly remove oxygen, nitrate, and sulfate from the groundwater. Once oxygen, nitrate, and sulfate have been utilized, fermentative or methanogenic conditions develop and hydrogen is produced by different microbes that accomplish even further breakdown of these fuel-related hydrocarbons. The hydrogen is then utilized as an energy source and electron donor by other microbes within the subsurface. It is under these conditions that reductive dechlorination of PCE to TCE to *cis*-DCE to VC occurs via a process known as halorespiration. If electron donors are present in sufficient supply, the breakdown will go to completion and the harmless products of ethene and ethane are formed. At some sites, there may be an insufficient supply of electron donors and the chlorinated solvent degradation may stall. This results in the undesirable accumulation of elevated *cis*-DCE and VC levels in groundwater. The goal of ENACP is to minimize the potential for this stall by enhancing and maintaining the optimal growth conditions for dehalogenating bacteria.

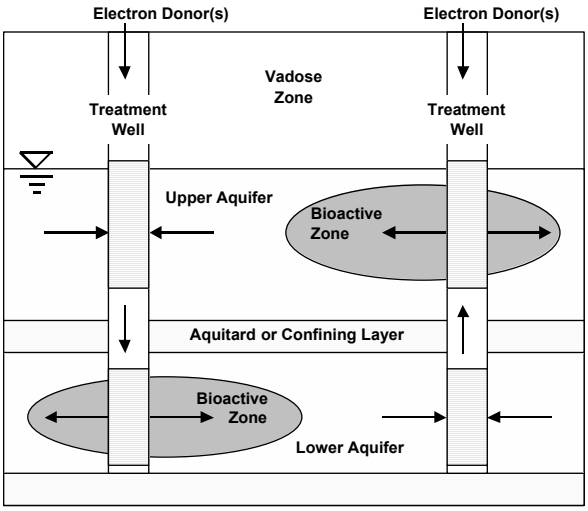



***Figure 1. ENACP In Situ Mixing/Treatment Well Schematic***

## Technology Description

The ENACP technology is innovative because it involves advanced subsurface mixing and amendment addition to accelerate the in situ conversion of chlorinated solvents into harmless products. The factors that contribute to improved remedial performance using ENACP include:

- **Improved Mixing.** An innovative recirculation system is used to improve subsurface mixing and the bioavailability of the contaminants, electron donors, and electron acceptors. Figure 1 shows a schematic of this unique pumping system which eliminates the need to pump groundwater to the surface. In one well, the groundwater is extracted

from the lower screen, amendments are added, and then the groundwater is injected back through the upper screen. The second well is operated in the reverse direction resulting in recirculation between the two wells and the establishment of upper and lower bioactive zones.

- **Active Amendment Supply.** At some sites, the supply of electron donors or acceptors may limit the rate of natural attenuation. Several electron donors have been identified in the literature that promote the dehalogenation of chlorinated solvents. For the Moffett Field demonstration, sodium propionate was used as the amended electron donor when it became apparent that the site was electron-donor limited. This amendment was selected based on the investigators' past experience and site-specific laboratory microcosm experiments.
- **Targeted Inhibitor Removal.** Another potential complication of in situ attenuation is the formation of inhibiting factors such as sulfide. Inhibitors can be removed via several targeted in situ processes. For example, sulfide concentrations can be lowered biologically by the addition of nitrate, which can stimulate the biological oxidation of sulfide.

### Demonstration Results

The ENACP technology was tested at the Moffett Federal Airfield in California where contamination from on-site dry cleaning and fuel operations had become commingled within a regional volatile organic compound (VOC) plume that originated off-site. At the beginning of the demonstration, TCE and its breakdown products were present at the site, with *cis*-DCE as the most prevalent contaminant. Only low levels of fuel hydrocarbons were noted at the time of the demonstration. It was determined that the site was likely electron donor limited and that ENACP would be useful to further promote the degradation of *cis*-DCE and VC that had accumulated in groundwater at the site. As shown in Table 1, the Moffett Field site had several favorable characteristics for selection as the demonstration site including a shallow aquifer and suitable groundwater flow and pumping characteristics.

Sodium propionate was selected as the electron donor amendment and was delivered to the groundwater through a pair of treatment wells (see Figure 1 schematic). Each well was drilled to a depth of 40 feet bgs and screened in two zones from 10–25 feet bgs and 30–40 feet bgs. These intervals corresponded to the presence of two high-conductivity layers within the aquifer. Groundwater was pumped through the treatment wells in such a manner as to establish partial recirculation of water between the wells. The well pair captured a contaminant plume approximately 55 feet wide in the upper layer and approximately 110 feet wide in the lower layer.

The ENACP demonstration was performed in two time periods: Spring 2002 and Autumn 2002. The spring demonstration began in March, but was discontinued before June due to clogging of the treatment wells. The well assemblies were removed in August, the treatment wells were swabbed, and the well assemblies were re-installed.

***Table 1. Summary of Site and System Characteristics***

| Parameter | Potential Range | Moffett Field |
|---|---|---|
| Well Spacing | 4-16 m | 7.2 m |
| Upper Screened Section | Variable | 10-25 ft bgs |
| Lower Screened Section | Variable | 30-40 ft bgs |
| Pumping Rate in Wells | 1-10 gpm | 2 gpm |
| Groundwater Velocity | 0.1-100 cm/day | 10 cm/day |
| Electron Donor | Variable | Sodium propionate |
| Donor Concentration | Variable | 250 mg/L |

Note: *bgs* = below ground surface
*gpm* = gallons per minute

The autumn demonstration began on 4 September 2002 and ran until 3 November 2002 for a period of 60 days. During the autumn demonstration, pulsed injection of the sodium propionate solution was initiated to prevent excessive biomass growth and subsequent well clogging. The sodium propionate solution was pulsed for 8 hours/day for a time-averaged concentration of about 250 mg/L into the aquifer.

Table 2 shows overall changes in the concentrations of *cis*-DCE, VC, and ethene in the upper zone and the lower zone of the treated aquifer after a two-month time period. The *cis*-DCE concentration in the upper layer decreased steadily from approximately 400 µg/L to 20 µg/L after 60 days. After an initial increase, VC dropped to below 50 µg/L in the upper layer. The dehalogenation of VC to ethene accelerated towards the end of the project as demonstrated by the increase in ethene from 100 µg/L to 200 µg/L in the upper layer. In the lower layer, the concentration of *cis*-DCE did not change significantly over time within the treatment well itself. However, *cis*-DCE was converted from over 900 µg/L to below 30 µg/L within the travel time to the nearby monitoring wells located within the lower layer.

For example, Figure 2 shows that the presence and growth of dehalogenating bacteria were indicated in the lower zone by the overall contaminant trends in the nearby groundwater monitoring well. The *cis*-DCE levels declined steadily as the microbes converted *cis*-DCE to VC. The VC levels increased initially, but decreased as the reaction moved towards completion and the production of increasing levels of ethene.

***Table 2. Contaminant Initial and Final Concentrations***

| Contaminant | Location | Initial Conc. (µg/L) | Final Conc. (µg/L) |
|---|---|---|---|
| *cis*-DCE | upper layer | 400 | < 20 |
| | lower layer | 900 | < 30 |
| Vinyl Chloride | upper layer | 120 | < 50 |
| | lower layer | 80 | < 20 |
| Ethene | upper layer | 100 | 200 |
| | lower layer | 20 | 80 |

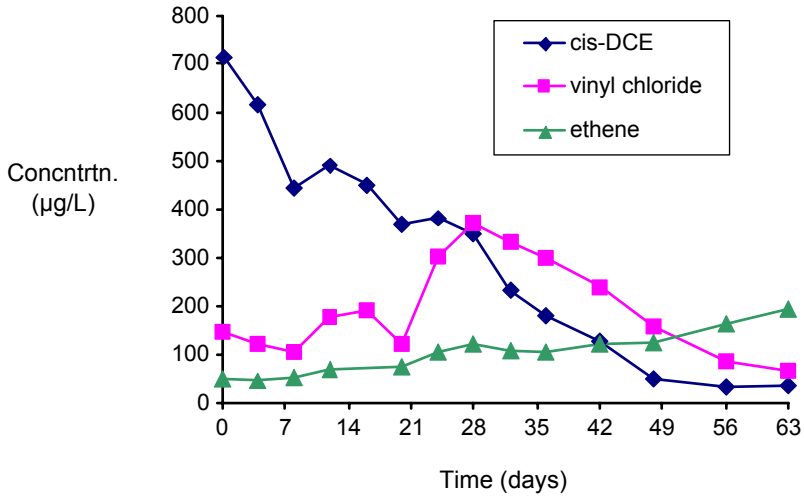



***Figure 2. Concentrations of cis-DCE, VC, and Ethene at Monitoring Well 2-5***

Based on the study data, the investigators anticipated that *cis*-DCE and VC would be biodegraded to below the drinking water maximum contaminant levels (MCLs) given sufficient operational time. The MCLs were achieved for *cis*-DCE and VC at some locations after only two months of operation. However, the *cis*-DCE and VC levels were above MCLs at other locations, but still declining at the end of the demonstration project. No additional problems with injection well clogging were experienced. Sulfide toxicity was not a problem at the site, but may have occurred if continued operation resulted in significant sulfate reduction to bisulfide and sulfide.

### Conclusions

Based on the demonstration results discussed above, the ENACP technology shows promise as a quick and cost effective remedial approach. It offers several advantages over conventional remediation methods such as pump-and-treat and intrinsic (e.g. not enhanced) natural attenuation. However, it should be noted that the halorespiration process is relatively unpredictable and it is often challenging to optimize subsurface conditions in order to promote effective and complete cleanup of chlorinated solvent contamination. Navy remedial project managers (RPMs) interested in this potential remedial approach for commingled plumes should consider their site-specific conditions, along with the major advantages and limitations listed below.

The primary advantages of this technology include:

- Remediation is accomplished in situ without pumping ground water to the surface for treatment.
- No secondary wastes are generated that require off-site disposal or further treatment.
- Contaminants are degraded into harmless products such as ethane, ethene, carbon dioxide, water, and/or inorganic salts.
- Less likely than intrinsic natural attenuation to lead to the accumulation of toxic daughter products such as *cis*-DCE and VC.
- Cleanup will typically occur faster than with intrinsic natural attenuation.
- Less expensive than conventional pump-and-treat remediation.

The primary limitations of this technology include:

- Well clogging may result from amendment injection and may require well redevelopment, pulsed injection schemes, hydrogen peroxide, or other prevention methods.
- Dechlorination of chlorinated solvent compounds and the oxidation of fuel hydrocarbons may not be coupled due to incomplete mixing within the subsurface.
- The fuel hydrocarbons that serve as the electron donor source may be exhausted before dechlorination of the chlorinated solvents is complete. In this case, amended electron donors will need to be applied at the site.
- The fuel hydrocarbon transformation may be inhibited due to build-up of toxic by-products, such as sulfide. In this case, targeted mechanisms for inhibitor removal must be implemented.

### Point of Contact

*For more information about the ENACP technology or the demonstration project, contact:*
*(805) 982-1616*

# Early Transfer Facilitates Successful Redevelopment of Navy Property

## NCTS STOCKTON

The Navy completed the transfer of Naval Computer and Telecommunications Station San Diego Detachment, Stockton (NCTS Stockton), former Rough and Ready Island, in September 2003 by public benefit conveyance. The transfer was accomplished using the Early Transfer Authority under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) Section 120(h)(3)(C) and is the first Navy non-BRAC transfer to be accomplished using this authority.

### Project Summary

The United States is required by CERCLA 120(h)(3)(C)(iii) to provide a warranty that all response actions necessary to protect human health and the environment have been taken. The period between the transfer of title and the making of this final warranty is known as the "deferral period." Prior to mid-1996, environmental cleanup actions at Federal facilities had to be complete (or remediation systems shown to be operating successfully) before excess Federal property could be transferred to the public for reuse. In June 1996, CERCLA was amended to allow deferral of this requirement by the state Governor and "early transfer" of the property before the required cleanup actions had been completed. The U.S. Environmental Protection Agency (USEPA) and the Department of Defense (DOD) each issued early transfer guidance (USEPA for National Priorities List or NPL sites, and DOD for non-NPL sites) in 1998. By using this authority, the local communities could obtain local ownership of the property several years earlier than under a standard transfer scenario. In such cases, the Navy must make certain assurances and arrange for interim land use controls to be in place to protect human health and the environment during the ongoing cleanup. There are potential benefits to early transfer for both the communities and the Navy:

- Community benefits:
  - Expedited reuse with concurrent cleanup protective of human health and the environment
  - Faster cleanup
  - Earlier ownership improves bargaining position with investors, developers and potential tenants
  - Earlier tax and real estate sales revenues
  - Earlier job creation
  - Navy not involved in leasing

- Navy benefits:
  - Compressed transfer schedule increases focus and priority on transfer, cleanup and funding
  - Frees up resources for its primary mission - national defense
  - Eliminates caretaker costs

| | |
|---|---|
| **Site/Location:** | Naval Computer and Telecommunications Station San Diego Detachment Stockton, CA |
| **Site Description:** | The former NCTS Stockton is located on 1,490-acre Rough and Ready Island in the Central Valley of California. The island is bounded by the Stockton Deep Water Channel to the north, the San Joaquin River to the east, and Burns Cutoff to the south and west. The island is protected from higher surrounding waters by levees. The island is divided into four general land use areas, the Administrative Area, the Agricultural Area, the Landfill Area, and the Warehouse Area. For land management purposes, the island was originally divided into 185 parcels based on land use, known contamination, and proximity of buildings. An additional 60-acre parcel is to be transferred to the Immigration and Naturalization Service. The Phase III early transfer parcels occupy a total area of approximately 496 acres. |
| **NCTS Contact:** | (209) 467-2430 |
| **EFA Contact:** | Karen Powell (Contracting Officer)<br>Richard Powell (RPM)<br>Walter Kim (TtEMI) |
| **ET Hub Contacts:** | (843) 820-7358 |
| **Legal Driver:** | CERCLA 120(h)(3)(C) |
| **Decision Document:** | Finding of Suitability for Early Transfer |

There are two possible early transfer scenarios. In the first scenario, the community takes ownership and begins development for reuse while the Navy continues the cleanup. Under the second scenario, a community takes both ownership of the property and responsibility for achieving cleanup/regulatory closure (with assistance from a developer and/or contractor) using funds provided by the Navy.

The second scenario is referred to as a remediation buyout and requires an Environmental Services Cooperative Agreement (ESCA) between the Navy and community and an enforceable agreement between the community and the regulatory agencies (i.e., USEPA and/or the state environmental agency). Potential cost avoidance can be realized by the community in a buyout scenario by combining or coordinating remediation and development activities.

In February 1996, Congress passed special legislation, Public Law 104-106, Section 2871, to allow the Navy to convey property and waterfront assets at Rough and Ready Island to the Port of Stockton, California (Port) for the purpose of expanding its maritime operations. The special legislation permitted the transfer to be made as a public benefit conveyance for Port development.

*Aerial map of Rough and Ready Island at the Port of Stockton, CA*

In July 2000, Naval operations ended at Rough and Ready Island. At that same time the Navy conveyed an interest in 158 parcels on the island through transfer or lease to the Port. Sixty-nine parcels were leased and 89 parcels (about 496 acres), referred to as Phase I parcels, were found environmentally suitable for transfer in a Finding of Suitability to Transfer (FOST) and transferred by deed to the Port. Phase I property was transferred through the U.S. Department of Transportation Maritime Administration (MARAD), in accordance with Federal real property disposal laws. Of the 69 parcels originally leased, an additional 33 subsequently were determined to be transferable in a Phase II FOST. The Phase II transfer (approximately 412 acres) was completed in July 2002.

In August 2000, the Port of Stockton notified Engineering Field Activity West (EFAWEST) that they had developed a reuse plan that included NCTS Phase III property and requested that the Navy pursue early transfer with an ESCA for the Port to take on cleanup responsibility for all remaining sites within the parcel.

In March 2001, EFAWEST requested approval to enter into discussions concerning early transfer with the Port. The understanding with the Port was that in order for the Navy to fund the action, it would need to make good business sense to the Government since it would alter set priorities of the Navy Installation Restoration Program. The request to proceed with discussions was approved by the Deputy Assistant Secretary of the Navy (Installations and Facilities) on 2 August 2001. The Government and the Port began discussions on 7 August 2001.

The initial discussion phase included "due diligence" by the Government and the Port followed by discussions on the assumptions and scope of work required for the remediation in light of the Port's reuse plans. The Port also began discussions with the State regulatory agencies and reported the State's disagreements with the Navy's presumptive remediation plans. After a series of negotiations between the Port and the Navy, in October 2002, the parties agreed on a buyout of $23.47 million to cover all issues, including remediation costs, insurance and administration of the project.

Prior to entering into negotiations, a detailed site-by-site analysis was conducted by the NAVFAC Early Transfer Hub and the EFAWEST CLEAN contractor to validate the Government cost to complete (CTC) estimate for the environmental restoration of the Phase III parcels at NCTS. Using a probabilistic cost estimate approach, similar to that outlined in ASTM *Standard Guide for Estimating Monetary Costs and Liabilities for Environmental Matters*, alternative environmental scenarios were evaluated to develop three Navy cost estimates: Minimum, Mid-Range (Expected), and Maximum. The basic elements included in the CTC estimates are the following:

- Finalizing RI/FS Documents
- Completion of RAP/FOST/EBS
- Completion of ROD/Proposed Plan
- Remedial Design/Remedial Action
- Long Term Groundwater Monitoring
- Long Term Operation and Maintenance
- Institutional Controls/Deed Restrictions
- Project Management by Subcontractors
- Navy Oversight
- Regulatory Oversight

The Port's final offer of $23.47M, which included costs necessary for the remediation cleanup, administration and insurance was at the low end of the Navy's CTC range. An ESCA between the Navy and the Port was entered into pursuant to the authority of the Defense Environmental Restoration Program, Title 10 of the U.S. Code (U.S.C.) Section 2701(d), that specifies the obligations of the Port and the Navy for environmental response actions within the Phase III early transfer parcels during and after the deferral period. The Port agreed to receive payout from the Navy of the $23.47 over seven years.

### Regulatory Requirements/Community Involvement

Section 120(h)(3)(C) of CERCLA authorizes early transfers conditioned on State Governor approval for sites such as NCTS Stockton that are not on the National Priorities List. Thus, close coordination of the Navy team with the Port and the State of California, DTSC and the Central Valley Regional Water Quality Control Board (CVRWQCB) was crucial to securing the Governor's approval of the FOSET. A final Consent Agreement between the Port and State of California, DTSC and the Central Valley Regional Water Quality Control Board (CVRWQCB) is required for the Port to take on the cleanup. The purpose of the Consent Agreement is to establish the process and timetable for completion of necessary response actions and to ensure that the necessary land use and deed restrictions to be protective of human health and the environment and remedial actions on the use of the Phase III early transfer parcels are implemented by the Port.

### Construction Challenges

The early transfer was critical to the Port of Stockton to accommodate the increased shipping business opportunities on the West coast. Challenges for the Navy included:

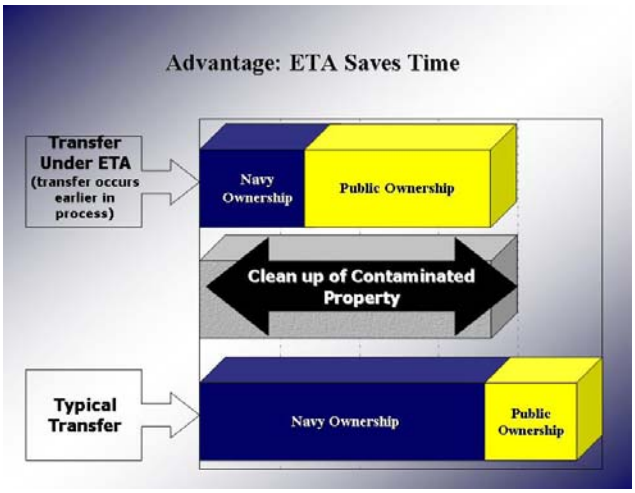
- This was the first ever early transfer of a non-BRAC installation using Environmental Restoration, Navy (ER,N) dollars to fund an ESCA
- Impacts to annual allocations to the ER,N budget had to be minimized
- Many sites were in the remedial investigation/feasibility study phases
- This was the first time the Navy's ESCA evaluation guidance had been used

### Cost Avoidance Measures

The proposed early transfer arrangement of $23.47M paid out to the Port over seven years provides a positive net present value when compared with the Navy's validated cost to complete. In addition, the Navy would avoid potential future cost increases due to changes in identified remediation requirements, regulatory compliance costs, litigation cost (resulting from environmental activist actions), natural disaster, etc.

Cost-cap and pollution liability insurance policies, obtained by the Port of Stockton and its contractors, virtually eliminate potential future

costs Navy could incur due to unknown contamination found at the site or cost over-runs. Therefore, the Navy's acceptance of the Port's offer is not only cost effective, but may provide opportunities for cost avoidance associated with these uncertainties while transferring the environmental liabilities to the Port.




The Navy also receives other benefits from this early transfer as noted above and including obtaining earlier credit for Defense Planning Guidance (DPG) goal sites. As a note, the benefits to the City of Stockton and surrounding area with the presumed infusion of jobs and revenue have not been considered as a part of this decision but the benefits to the community do exist.

### Project Successes

Early transfer projects are always more likely to be successful when there are economic incentives to take the property from the Navy. In this case, the Port of Stockton had opportunities to expand its business with the development of Rough and Ready Island. The transfer with ESCA made good business sense to the Navy because the funds for the ESCA were less than the Navy would have spent on cleanup if a traditional cleanup and transfer had been pursued. Other successes include:

- The first early transfer with ESCA on a non-BRAC Navy installation
- Property transfer 3-6 years ahead of schedule (based on estimated cleanup time)

# Technology Transfer (T2) News

**Visit Our Web Site Address:**
**www.ert2.org**

## T2 Survey Results Are In!

NAVFAC has set several goals for the Technology Transfer (T2) Program. One of the goals is to identify and address challenges faced by Navy Remedial Project Managers (RPMs) in achieving successful and cost effective environmental restoration. Another goal is to facilitate the transfer of lessons learned by one Navy RPM or Engineering Field Division/Activity (EFD/A) for the benefit of the entire NAVFAC community. In order to identify these challenges and lessons learned and to better address the expectations of Navy RPMs, NAVFAC recently issued an on-line T2 Program survey to Navy RPMs in July 2003. The information gathered from this survey is being used to ensure that the T2 Program remains focused on useful and relevant environmental restoration topics.


Survey results revealed that the respondent's top three barriers to using innovative technologies are:

1) the uncertainty related to project costs,
2) the lack of regulatory acceptance, and
3) performance risk.

**75% of those surveyed have greater than 7 years of environmental professional experience.**

When asked which types of T2 products would assist in overcoming these barriers, respondents indicated that the Remediation Innovative Technology Seminars (RITS), NAVFAC guidance documents, technical expert assistance, and NAVFAC Web Training Tools would be most helpful.

Survey participants responded that they would like more technical assistance focusing on the Remedial Investigation/Feasibility Study and the Interim Remedial Action phases of the Installation Restoration program. Results also indicated that the top three contaminants that pose the greatest challenge to cleanup and closure at Navy sites are volatile organic compounds (VOCs), metals, and semivolatile organic compounds (SVOCs). Future T2 products will be focused on the top contaminants of concern as well as the phases of the IR program that pose the greatest challenges, in order to meet the needs of Navy RPMS and their projects.

The T2 Program survey is also being used to determine the overall interest in and satisfaction with the T2 Program among Navy RPMs. In order to maintain the high level of satisfaction, a new T2 program survey will be distributed annually to collect input on the needs, challenges, and the successes of Navy RPMs. Look for the next annual survey to be released in the spring of 2004.

## Survey Indicates Diffusion Samplers Are Easy to Use and Effective

At the request of the Alternative Restoration Technology Team (ARTT) Workgroup, NAVFAC recently distributed an online survey to evaluate the use of diffusion samplers for groundwater monitoring at Navy sites. The first objective of the survey was to identify the regulatory, economic, organizational, or personal barriers encountered while using diffusion samplers. Secondly, the survey was focused on identifying cost avoidance, time savings, and other benefits associated with the technology. The third objective was to determine the impact of relevant T2 products on the decision-making process surrounding Navy RPMs use of diffusion samplers.

**70% of survey participants are very satisfied to satisfied with the NAVFAC Technology Transfer**

Approximately 28% of survey respondents had experience using the diffusion samplers at their site. They indicated that the samplers are used primarily during the Remedial Investigation, Long

Term Management, or the Remedial Action Operations stage of their projects. Of the respondents that use diffusion samplers, 100% find them not difficult to very easy to use. Additionally, 100% of respondents rated the technical quality of the sampling results obtained from diffusion samplers from moderate to high.

**28% of survey respondents have experience using diffusion samplers at their site.**

Those surveyed were asked to rate their experience with regulatory acceptance of diffusion samplers at their sites in order to gauge whether or not regulatory issues have discouraged the adoption of this technology. Approximately, 55% rated their experience as not difficult and 36% rated their experience with regulatory acceptance as very easy to easy.

For more information about the use of diffusion samplers, Navy RPMs can consult some of the current T2 products available such as the NAVFAC Tech Data Sheet, the United States Geological Survey User's Guide, and the Interstate Technology Regulatory Council (ITRC) Diffusion Sampler Web Page. This information can be found on NAVFAC's ERB web site and at the ITRC's web site http://diffusionsampler.itrcweb.org. One hundred percent of respondents who have used diffusion samplers have viewed one or more of these products. However, 83% of all survey respondents would like to see additional T2 products that highlight more up-to-date information about diffusion samplers. Look for a Web Training Tool in 2004 to highlight NAVFAC's recent experience with the implementation of this new and improved groundwater monitoring technique.

### Charleston Naval Weapons Station Case Study Web Site

The Navy's Southern Division will be the first to showcase the implementation of innovative technologies on a custom web site. This web site has been developed as part of NAVFAC's Technology Transfer (T2) Program and covers recent remedial activities at the Solid Waste Management Unit (SWMU) 12 at the Naval Weapons Station (NWS) in Charleston, South Carolina. The web site is the first in a series of web-based case studies that will be created under the T2 Program.

The NWS Charleston Case Study Web Site features site history, environmental background information, as well as several interactive Web Data Sheets. The Web Data Sheets focus on three topics:

1) Innovative site characterization methods used at the site,
2) Innovative remedial action technologies implemented including phytoremediation and a permeable reactive barrier installation and
3) Innovative data management methods such as a tablet computer to collect real time field data and other automated processes.

Look for a T2 email update announcing this new and exciting Case Study Web Site in spring 2004 and others soon to follow.

### Point of Contact

*For more information, contact:*
*Your TSR or (805) 982-2636*

*For more T2 information, contact:*
*(805) 982-2194*

Accelerating Site Closeout — Improving Performance — & Reducing Costs Through
# OPTIMIZATION
June 15 – 17, 2004
Dallas, Texas

You are invited to the **Conference on Accelerating Site Closeout, Improving Performance, and Reducing Costs through Optimization**.

This conference is being presented by the Federal Remediation Technologies Roundtable (FRTR), U.S. Environmental Protection Agency (US EPA), U.S. Navy (USN), U.S. Department of Energy (US DOE), U.S. Air Force (USAF), U.S. Army Corps of Engineers (USACE), Defense Logistics Agency (DLA), Strategic Environmental Research and Development Program (SERDP)/Environmental Security Technology Certification Program (ESTCP), and Interstate Technology Regulatory Council (ITRC).

## Date
Tuesday, 15 June 2004~Thursday, 17 June 2004

## Location
Westin City Center
650 N. Pearl Street
Dallas, TX 75201

## Conference Goals

- Outline long-term remediation liabilities and optimization needs and opportunities
- Disseminate existing and emerging optimization strategies, technologies, tools, and science
- Communicate lessons learned. Identify technical, institutional, contractual, and other enhancements and encumbrances to achieving positive optimization results
- Present remedial optimization within the context of site wide and multi-site management programs

## Who Should Attend

- Remediation program managers responsible for program planning and costs
- Public health and regulatory officials responsible for protection of public and environmental health and risk mitigation
- Remediation system operators and project managers responsible for system performance, costs, and schedule
- Optimization service developers and service providers

## Abstract Submission
If you are interested in submitting an abstract for an oral presentation, please visit http://clu-in.org/siteopt to view the abstract submission guidelines and suggested abstract topics. **Abstracts are due by 6 February 2004**.

## Registration
To register for the conference, please visit http://clu-in.org/siteopt. Online registration is the easiest way to register and receive quick confirmation.

## There is no registration fee to attend.

# 2004 Navy and Marine Corps Cleanup Conference

## 10-12 February 2004
## Oxnard, California

You are invited to the **2004 Navy and Marine Corps Cleanup Conference**

This conference is being sponsored by the Naval Facilities Engineering Command (NAVFAC).

### Date
Tuesday, 10 February 2004~Thursday, 12 February 2004

### Location
Embassy Suites Mandalay Beach Resort
2101 Mandalay Beach Road
Oxnard CA 93035

### Conference Goals

- Promote information exchange and fast track cleanup of hazardous waste sites
- Discuss Washington Perspective on environmental cleanup policy
- Conduct RPM training sessions on various environmental technologies
- Conduct technical sessions on innovative technologies
- Present case studies/success stories

### Who Should Attend

- Remedial project managers (RPMs) and their managers involved in the environmental restoration program.

### Presentation Submission
If you are on the agenda and submitting a presentation, please call DSN 551-4858 to make arrangements to submit an electronic file (PowerPoint preferred) of your presentation. **Presentations are due by 30 January 2004**.

### Registration
To register for the conference, and get information on lodging, agenda, directions, and security, please visit http://enviro.nfesc.navy.mil/erb/erb_a/support/cleanup_conf/2004conf/conf2004.htm. You may also call DSN 551-4852, (805) 982-4852 or FAX (805) 982-3694, or e-mail rits@nfesc.navy.mil.

**Hope to see you there!**