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Name of Installation: Marine Corps Air Station, Cherry Point

Award category: Environmental Restoration - Team

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Abstract:

Marine Corps Air Station Cherry Point Tier I Partnering Team has fully embraced the partnering process as an effective method to facilitate cleanup efforts at the Air Station. Through the use of innovative and effective site management, investigation, and cleanup techniques, the Cherry Point Partnering Team has re-energized an installation restoration program that protects human health and the environment, supports the installation, and promotes efficient and cost effective site closure. Cherry Point's commitment to protecting human health resulted in recent program initiatives that led to a USEPA determination that the interim and final remedies currently in place are protecting the health of the Air Station's residents, workers, visitors, and neighbors. The Cherry Point Partnering Team actively seeks innovative ways to successfully apply information and technology to advance the cleanup of difficult and highly contaminated areas; one such initiative led to the successful reduction of a concentrated high-level chlorinated plume located within the congested and industrialized NADEP. In the beginning of FY02, with a turnover of more than half the Team's personnel, a renewed dedication to the cleanup effort has resulted in a significant improvement in regulatory cooperation; cooperation that was manifested as a remarkable increase in document completions, site closures, and cost reductions. The Partnering Team spearheaded initiatives supporting the local community by dramatically increasing small and disadvantaged business participation and improving the public's access to the restoration

program

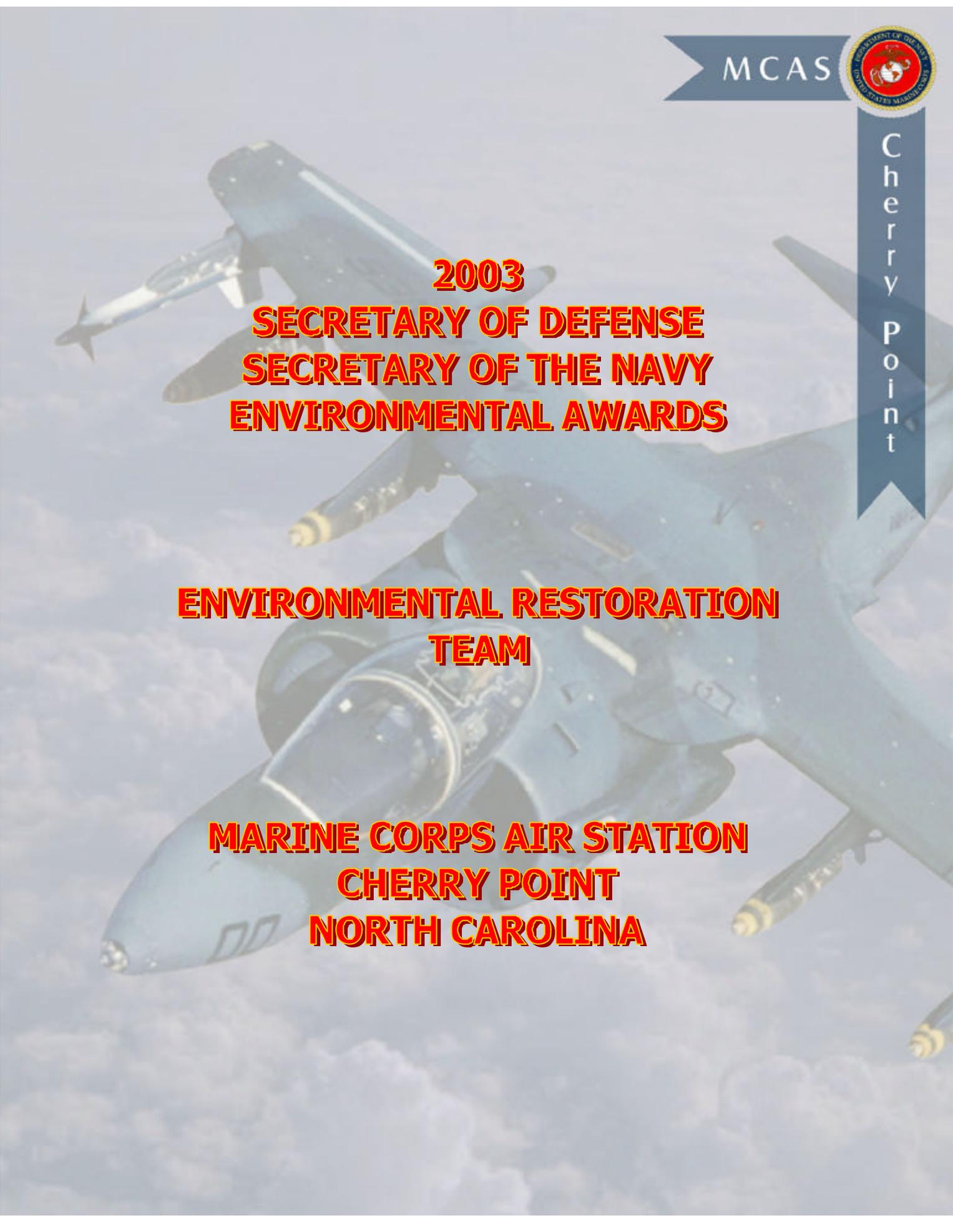
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**2003
SECRETARY OF DEFENSE
SECRETARY OF THE NAVY
ENVIRONMENTAL AWARDS**

**ENVIRONMENTAL RESTORATION
TEAM**

**MARINE CORPS AIR STATION
CHERRY POINT
NORTH CAROLINA**



INTRODUCTION

Commissioned in 1942, MCAS Cherry Point and Naval Aviation Depot (NAVAVNDEPOT) have served the country for more than half a century. Home to 8,000 Marines and sailors, 19,200 dependants, and 5,700 civilian employees, Cherry Point is the Marine Corps' largest air station. With over 3,700 employees, NAVAVNDEPOT, Cherry Point, is also the single largest industrial facility in Eastern North Carolina.

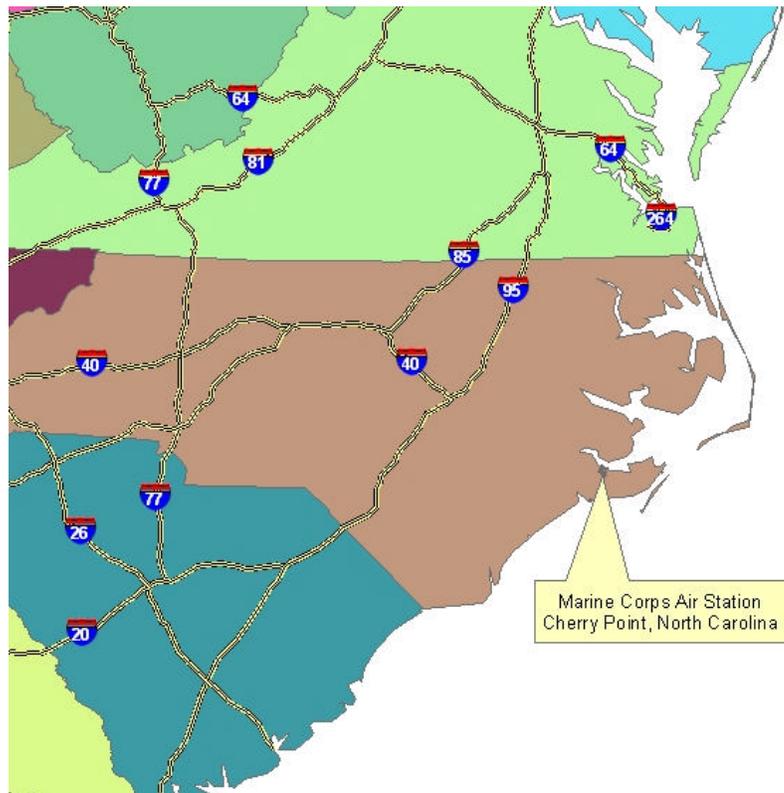
As its primary mission, MCAS Cherry Point operates facilities and provides services in support of three major tenant commands, the 2nd Marine Aircraft Wing (2d MAW), NAVAVNDEPOT, and the Naval Hospital. The 2d MAW operates both flying and ground support assets at Cherry Point. These include an air traffic control group, a low altitude air defense group, three AV-8B Harrier II squadrons, four EA-6B Prowler squadrons, one KC-130 Hercules refueling squadron, and the Marine Corps' only Harrier and Hercules training squadrons. The Naval Aviation Depot provides full service repair, rework, and support capabilities to fleet aircraft. In addition to providing ground support services and facilities, the Air Station also operates a squadron of HH-46D search and rescue (SAR) helicopters, C-9 and C-12 fixed wing aircraft, and the vitally important BT-9 and BT-11 air-to-ground target range complexes and the Mid-Atlantic Electronic Warfare Range. In addition to supporting the 2d MAW training mission, the Air Station's SAR aircraft provide a vital and visible presence in the local community by supporting fire fighting, medical evacuation, and the 5th Coast Guard District and U.S. Air Force SAR missions.

Cherry Point covers 11,717 acres with an additional 15,980 acres in outlying support areas. The uplands consist

generally of pine flatwoods along with various habitats that support numerous species of plants and animals, including white-tailed deer, wild turkey, and endangered species such as the American alligator, spring goldenrod and bald eagle.

MCAS Cherry Point is surrounded on three sides by the environmentally sensitive waters of Slocum Creek, Hancock Creek, and the Neuse River. As well as offering recreational opportunities for Air Station residents and the local community, this estuarine environment serves as habitat for many species of migratory birds and as a nursery for coastal shore birds and marine life.

With only 135,000 people living in the surrounding Carteret, Craven, and Pamlico counties, the area retains a rural character. However, encroachment and demographic changes from significant population growth - particularly along the Atlantic Ocean beaches of Carteret County - bring





increasing challenges for both environmental and operations staff and highlight the need for innovative thinking and active communication with the surrounding communities.

BACKGROUND

Environmental Cleanup Challenges

The environmental restoration challenges faced by Cherry Point's Partnering Team stem primarily from past activities at the industrial center of the Air Station, including the NAVAVNDEPOT. Poor practices related to the handling and disposal of industrial chemicals, wastes, and fuels over the years have resulted in several extensive contaminant plumes and numerous smaller waste disposal units.

Several of the Air Station's cleanup sites are extremely large and complex. The central industrial area alone includes a large grouping of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Program sites designated as Operable Unit 1 (OU1), several petroleum sites being addressed under the Air Station's Underground Storage Tank (UST) Program, as well as several Solid Waste Management Units (SWMUs) that are being addressed under the Resource Conservation and Recovery Act (RCRA) SWMU Management Program. OU1 alone encompasses over 500 acres and contains more than 100 potential contaminant source areas and multiple commingled contaminant plumes.

MCAS Cherry Point's hydro-geological, industrial, and ecological settings create unique resource protection and human health concerns. The Air Station and several nearby municipalities rely on the groundwater underlying the facility for their drinking water supplies. Numerous construction and maintenance projects are implemented each year in the central industrial area alone. Each of these projects must be closely tracked to ensure that contractors are

CHALLENGES

1. *Remediating Large, Complex Sites*
2. *Addressing Unique Resource Protection and Human Health Concerns*
3. *Integrating Varied Regulations, Organizations, and Their Philosophies*
4. *Reestablishing an Atmosphere of Open Communication and Trust Following Numerous Personnel Changes*

advised of the presence of contamination and that worker exposure is minimized. In addition, MCAS Cherry Point and its outlying fields are located in the environmentally sensitive coastal plain of North Carolina. The surrounding estuarine environment is vitally important to the local commercial fishing industry. Thorough planning and effective implementation of remedial projects is critical to ensure protection of wetlands, surface water bodies, groundwater aquifers, drinking water wells, and other sensitive receptors.

MCAS Cherry Point is also faced with unique challenges relating to integration of various regulatory programs and organizations. The MCAS Cherry Point Environmental Affairs Department (EAD) is responsible for restoration and compliance efforts on three outlying airfields that are located in two different North Carolina counties (in addition to Cherry Point's home county) and are monitored by different regional offices of the North Carolina Department of Environment and Natural Resources (NCDENR). MCAS Cherry Point has the distinction of being the only DoD facility on the CERCLA National Priorities List that is also subject to a RCRA 3008(h) Administrative Order. This means that the restoration process must integrate the regulatory requirements of RCRA, CERCLA, and the State of North Carolina's various responsible agencies.

Possibly our greatest challenge, and our



greatest success, has been in reestablishing an atmosphere of open communication and trust between the team's Air Station and Navy representatives and the U.S. Environmental Protection Agency (USEPA) and North Carolina Department of Environment and Natural Resources (NCDENR) regulatory counterparts. During 2000 and 2001, the Air Station's CERCLA cleanup program suffered slow progress following numerous staffing changes in both the Air Station's and Navy restoration team and the regulatory community.

MCAS Cherry Point Tier I Partnering Team

The MCAS Cherry Point Tier I Partnering Team consists of representatives from each agency including the Navy, U.S. Environmental Protection Agency (USEPA), North Carolina Department of Environment and Natural Resources (NCDENR), MCAS Cherry Point, and CH2MHILL; the Comprehensive Long-Term Environmental Action Navy (CLEAN) contractor. By building upon a relationship of trust, the partnering team has been able resolve several contentious issues and eliminated a document backlog that had developed over the previous years.

In late 2001, a large turnover of Remedial Project Managers for the Air Station, Navy, NCDENR, and the CLEAN contractor resulted in new members aboard the Partnering Team. Empowered by their respective agencies, the Team quickly integrated and smoothly transitioned into high-performing mode and move the MCAS Cherry Point environmental cleanup program forward at a relatively brisk pace while remaining cost effective and more importantly, being protective of human health and the environment.

Some highlights of the many agreements reached include final approval of the remedial investigation reports for three operable units including the massive *Remedial Investigation*

Report for Operable Unit 1. Consensus was also achieved with the handling of low-level dioxin

MCAS Cherry Point Partnering Team

Jeff Christopher: MCAS Cherry Point

Rodger Jackson: LANTDIV

Gena Townsend, USEPA

George Lane, NCDENR

Doug Bitterman, CH2Mhill

Stacin Martin, CH2Mhill

Michelle Thornton, USEPA

Corey Rich, Tetra Tech NUS

Taylor Sword, SHAW

contamination at two operable units; a highly contentious issue that had stalled approval of the remedial investigation reports for both units for 12 months.

Community Outreach Programs

The success of MCAS Cherry Point's community outreach program is evident in the outstanding relationship that the Air Station enjoys with the surrounding community. The Partnering Team has made great efforts to ensure that the community is well informed of cleanup processes and decisions. These efforts include:

- holding quarterly public meetings of the Cherry Point Restoration Advisory Board (RAB);
- recruiting additional RAB community members;
- providing technical site tours to RAB members and the public;
- upgrading and maintaining extensive information repositories at two local libraries;
- publishing a Restoration Advisory Board newsletter; and
- developing a sophisticated community-

centered section for the Air Station's IR program web site.

In addition to these ongoing programs, the Cherry Point Partnering Team is completing a major update and transformation of the Installation Restoration Program's Community Relations Plan (CRP) to a Community Involvement Plan (CIP) and has completed an update of the administrative record along with a significant upgrade of the two local document repositories. When complete, the CIP will include detailed information on electronic resources available to those seeking information on restoration activities and will integrate with searchable electronic access to Cherry Point's updated administrative record provided at two local libraries and via the restoration program web site.

The net effect of these efforts is that the surrounding communities believe Cherry Point to be a good neighbor that will look out for their interests and "do the right thing" for the taxpayer, the community, and the environment. The Air Station's community outreach efforts have been so effective, in fact, that when one of the Cherry Point RAB members attended the Department of Defense Environmental Cleanup Stakeholders Forum she was shocked by the complaints she heard from other RAB members across the

Visit the MCAS Cherry Point Installation Restoration Program web site at:

www.lantops-ir.org/cherrypoint

country. She remarked that she felt "exceedingly well treated" because of the Air Station's efforts to be responsive to the community's concerns and to ensure that the community understood the technical issues, regardless of how complex.

In March of 2002, MCAS Cherry Point, the USEPA, and the NCDENR acknowledged the RAB members for their outstanding service and commitment to the community by presenting each member with a Certificate of Recognition.

Environmental Restoration Agreements, Cleanup Plans, and Schedules

A summary of MCAS Cherry Point's major environmental restoration agreements, cleanup plans, and schedules for the last five fiscal years is presented below. Historically significant milestones that occurred prior to this time period include completion of the *Initial Assessment Study* in 1983, initial *RCRA Facility Assessment* in 1987, execution of the *RCRA 3008(h) Administrative Order on Consent* in 1989, issuance of the RCRA Part B Permit in 1992, and listing of MCAS Cherry Point on the National Priorities List in 1994. Other highlights include:

- approval and implementation of the *Interim Record of Decision for Operable Unit 1 (Groundwater)* in 1997 and 1998;
- implementation of execution of the *Land Use Control Assurance Plan* in May 1999;
- approval of the *Record of Decision for Operable Unit 2* by the US Environmental Protection Agency (US EPA) in September



Dr. Patricia McClellan-Green, Co-Chair, MCAS Cherry Point Restoration Advisory Board, accompanies her Duke University Marine Lab students on a technical tour of the air sparge system at Operable Unit 1, Site 16.



- 1999;
- approval of the *Record of Decision for Operable Unit 3* by US EPA in October 2000; and
- development of a *Site Management Plan* for the Air Station's CERCLA sites in October 2000.

During the past two years, the CERCLA programs resolved several contentious issues and eliminated a document backlog that had developed over the previous two years. Some highlights of the many agreements reached include:

- signature of the Record of Decision (ROD) for Operable Unit 15;
- final approval of the remedial investigation (RI) reports for three operable units including the massive *Remedial Investigation Report for Operable Unit 1*;
- agreement on the handling of dissolved lead contamination at an operable unit and low level dioxin contamination at two operable units, both highly contentious issue that had stalled approval of the respective RI reports for 12 months;
- agreement on the investigation plans for three additional operable units;
- agreement that interim human health protection goals as defined by the RCRA environmental indicator for protection of human health have been met;
- agreement to incorporate the post closure care monitoring of a SWMU into the long term remedial monitoring of the surrounding operable unit; and
- transfer of Operable Unit 7 to the Air Station's UST Program where site closure was subsequently achieved.
- agreement to address chlorinated contamination at an adjacent UST site under the CERCLA investigation leading to the closure of the UST site.

PROGRAM SUMMARY

Cleanup Objectives

The IR Program's primary focus is to identify and restore sites posing a threat to human health and the environment in a technically sound, timely, and cost-effective manner. To this end, the Cherry Point Partnering Team has the following objectives:

- Prevent unacceptable risks to human health or the environment.
- Meet all regulatory requirements and deadlines.
- Use teamwork to share successful cleanup strategies that can be applied to the Air Station's restoration program.
- Maximize the use of innovative technologies and management approaches to support the installation missions and unit readiness, reduce costs, increase small business participation, and close sites.
- Improve relations with the community and team members by fostering an atmosphere of openness and trust.

Restoration Program Initiatives

To fulfill these objectives, the Cherry Point Partnering Team must constantly seek to improve the restoration program and has implemented several significant initiatives. These include:

- Completing a cross-program human health risk assessment, implementing contaminated media screening for construction projects, and continuing operation of the interim remedial measures in Operable Unit 1. These efforts allowed the USEPA to determine that the Air Station has met the RCRA environmental indicator for protection of human health.
- Improving community access to restoration program information. A multi-pronged initiative to update and transform the Air Station's Community Relations Plan and administrative record with versions that takes



full advantage of today's information technologies.

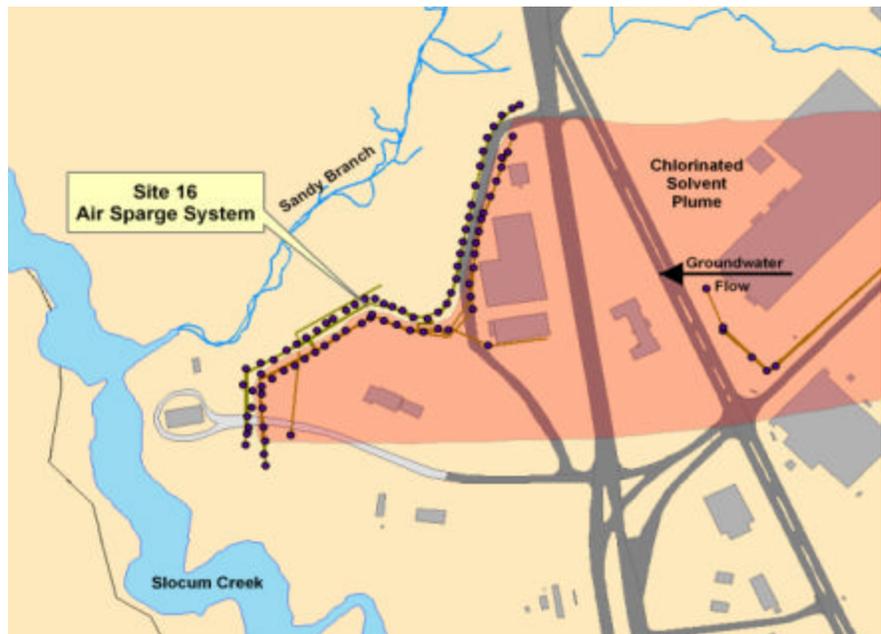
- Fostering an atmosphere of openness and trust with the regulatory community. A concerted effort to increase program efficiency by improving the military/regulator relationship, the success of this initiative is impressive as demonstrated by the CERCLA program decisions and agreements made during fiscal year 2002 and 2003; nearly twice as many when compared to the previous four years combined. This remarkable progress allowed the Partnering Team to finalize and clear a backlog of documents that had built up through 2000 and 2001.
- Applying innovative restoration technologies and management methods to improve program efficiency. Another multi-faceted cost saving initiative that includes shifting our operation and maintenance (O&M) contracting from "cost plus" to "firm fixed price" and implementing innovative cost saving technologies such as biological chlorinated source reduction, diffusion bag sampling, and on-site x-ray fluorescent analysis. In addition to reducing our overall O&M costs (which consumes half of our restoration resources), firm fixed price contracting increases access to restoration projects by small and disadvantaged businesses. During 2002, the first year of this initiative, \$181,000 in O&M business was contracted directly to small business entities at a savings of 11.7 percent. In FY2003, four additional CERCLA O&M sites and seven

UST sites (including the Air Station's largest and most complex UST system) were rolled into the program; annual fixed price contracting directly to small businesses exceeded 1.78 million dollars – or 75.7% of the total Environmental Restoration, Navy (ERN) budget for Cherry Point.

ACCOMPLISHMENTS

Human Health Risks Controlled

During 2002, the MCAS Cherry Point Installation Restoration Partnering Team completed a cross-program, multi-media reassessment of the risks to human health posed by the contamination remaining at the Air Station. The team concluded that the interim and final remedial measures that



During 2002, O&M of the Site 16 Air Sparge System was the initial site contracted to a small business at a savings of more than \$21,000. Currently, the Small Business Initiative has directed \$1.78 million, or 75.7%, of ER,N dollars to small business. The Air Station implemented air sparging at Site 16 as an interim measure to prevent groundwater contaminants from migrating to the environmentally sensitive Sandy Branch and Slocum Creek.



have been implemented are effectively protecting the health of Cherry Point’s residents, workers, visitors, and neighbors. This evaluation was based upon the guidance published by US EPA for assessment of the Government Performance Results Act environmental indicator for the protection of human health.

A significant portion of this protection is derived from the management programs that the Air Station has in place to prevent inadvertent exposure, including the provisions established in the Land Use Control Assurance Plan (LUCAP). The LUCAP is an agreement between the Air Station, USEPA, and NCDENR that outlines the administrative procedures and activities that the Air Station will implement to ensure that the land use assumptions used to develop the remedy implemented under a ROD will remain valid throughout the life of the remedy.

The Air Station developed and utilizes a screening process to protect workers and the general public at sites where no ROD is in place. During the multi-media screening process, existing environmental sampling data for the project area is downloaded from the CERCLA Program’s

Environmental GIS (EGIS) to the Air Station’s GIS and provided to the project planners along with specific soil handling and disposal guidance. This program not only allows the project developers to plan for the proper handling and disposal of contaminated media, but makes certain that site conditions are clearly established in the project bid documents, thereby ensuring that construction and maintenance contractors are fully informed of the environmental conditions at the work site and preventing their inadvertent exposure to contaminants.

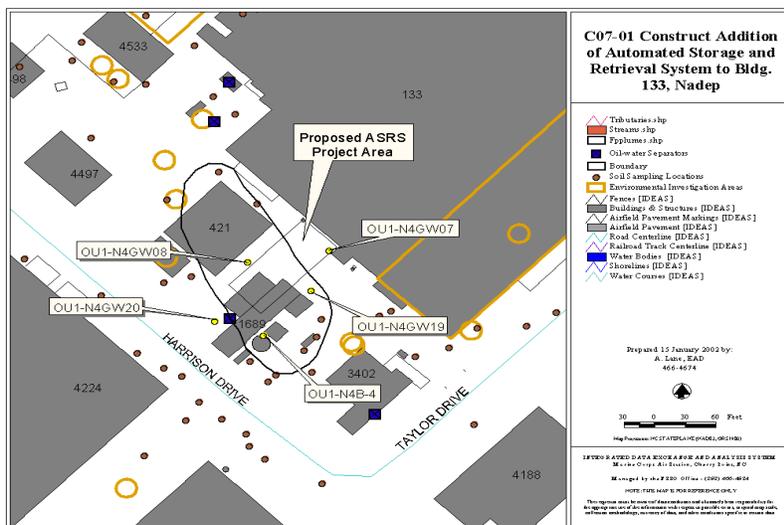
Optimization Study Realizes Significant O&M Cost Savings

In May 2002, the Partnering Team initiated a Remedial Action Operation (RAO) Optimization Study to evaluate the remedial systems at four Operable Unit (OU) active remediation sites:

- OU1, NADEP Central Hot Spot, Pump and Treat (P&T) System;
- OU1, Site 16, Air Sparge/Soil Vapor Extraction (AS/SVE) System;
- OU2, Site 10, Soil Vapor Extraction (SVE) System; and
- OU3, Site 7, Air Sparge (AS) System.

The optimization study evaluated and assessed the Air Station’s four remedial systems and provided recommendations for achieving site remedial actions objectives and closures for optimal life cycle cost.

Completed in February 2003, the RAO Optimization Study provided the Partnering Team with the quality information and



One of nearly 300 projects reviewed, a GIS map shows the NADEP Automated Storage and Retrieval System’s project location in relation to nearby environmental data points.



recommendation necessary to properly assess and evaluate each remedial system and effectively guide the Team in the decision making process.

Using the optimization results and recommendations, the Cherry Point Partnering Team was able to reach team consensus and turned off the AS system at Site 7. In August 2003, the Team again reached consensus and shut down the AS system at Site 10. Both system shutdowns have reduced the \$550,000 operation and maintenance (O&M) cost in 2003 by 25% or \$137,000. Projected 2004 O&M cost savings has been estimated at 49% or \$267,000.

Successful Innovative Source Reduction Technology Implemented

MCAS Cherry Point has successfully completed an innovative recalcitrant contaminant source reduction treatability assessment in the Building 137 Stripper Barn source area. Because the stripper barn's chlorinated solvent plume is located beneath a large building in the highly congested Naval Aviation Depot, applying conventional treatment technologies such as pump-and-treat or air sparging posed a myriad of technical problems that could be overcome only at very high cost. Rather than allow these problems to slow the clean-up effort, the Cherry Point project team instead chose to examine innovative source reduction technologies.

The team ultimately chose to implement enhanced in-situ bioremediation using injected Hydrogen Releasing Compound, or HRC[®]. HRC[®] slowly dissolves into the aquifer and provides a food source for indigenous bacteria that co-metabolize and de-chlorinate the solvents.

In the year since the HRC[®] was injected, chlorinated contaminant levels have decreased by 95 percent, proving that the technology is effective. Since HRC[®] injection can be implemented at a fraction of the cost of constructing a traditional treatment system, it is also extremely cost efficient. The team is now examining other contaminant source areas as

additional candidates for this promising technology.

Cooperation Between Partnering Team and Air Station UST/SWMU Programs Reduces Costs and Closes Sites

By effectively cooperating with MCAS Cherry Point environmental restoration program managers, the Cherry Point Partnering Team has enjoyed significant progress in the cleanup program. Several agreements have been reached between the Partnering Team and the Air Station's SWMU, UST, and UXO/Range Management program managers. These agreements have resulted in significant cost savings, accelerating site closure, and facilitating the resumption of a stalled remedial investigation.

Beginning in FY2003, the Air Station began to realize annual savings of \$30,000 per year in post-closure care sampling at the Solid Waste Management Unit (SWMU) I-10b. SWMU I-10b is located within the boundary of the CERCLA Operable Unit 2 (OU2), and the Air Station was able to obtain regulatory buy-in for eliminating its post-closure monitoring as a redundant duplication of the long term monitoring conducted for OU2.

After 12 months of stalled progress in the remedial investigation of Operable Unit 4 due to the presence of lead contamination, the Partnering Team was able to resolve the controversial issue by agreeing to address the lead issue under the Air Station's Range Management program. With assurances that the Air Station would investigate the source of the lead contamination and evaluate and address the potential for migration, the regulatory agencies were able to agree to segregate the lead contamination from the remedial investigation thereby allowing the

remedial investigation to continue.

After attributing low-level chlorinated contamination at a low-risk Operable Unit 7 to a past UST POL release currently under investigation by the Air Station's UST program, the Partnering Team was able to reach an agreement with the Air Station UST program to assume responsibility for addressing the contamination. The Partnering Team was able to obtain regulatory concurrence for the transfer of cleanup responsibility to the UST program enabling the CERCLA program to obtain site closure for OU7.

Innovative Range Characterization Technique Validated

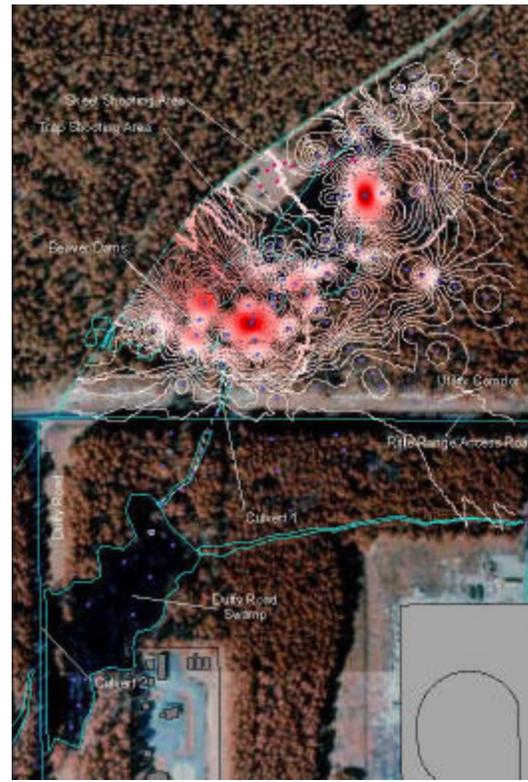
After lead was discovered in creek sediments at Operable Unit 4, the Partnering Team conducted additional soil and sediment sampling to help assess the source of the lead. Sample concentrations and delineation of the lead pointed the Team to the apparent source of the lead contamination. The creek running through OU4 was located downstream of an inactive skeet and trap range. To justify separating the lead contamination from the stalled remedial investigation, it was decided to assess the on-range extent and off-range migration potential of the residual lead contamination. Numerous soil and sediment samples were collected for on-site analysis using x-ray fluorescence (XRF) techniques. The real-time results were used to guide the assessment team's ongoing investigation and

were later validated through laboratory analysis of select samples.

The study validated that the source of the lead was the off-site inactive range. This permitted the regulators to agree to separate the lead contamination from the remedial investigation and continue with the CERCLA investigation. The Air Station Range Management Program assumed the

inactive range investigation and follow-up studies are underway.

The XRF technique proved to offer an



Lead concentration contours depict expected shotfall pattern and demonstrates site hydrology resulted in lead transport downgradient toward beaver dams into low energy forested wetland.

effective tool to quickly and accurately assess the lead contamination at the range. In November 2002, the project team presented the results of the investigation at the Society of Environmental Toxicology and Chemistry (SETAC) Conference in Salt Lake City.