



SECRETARY OF DEFENSE 2005 ENVIRONMENTAL QUALITY, NON-INDUSTRIAL AWARD 45TH SPACE WING, PATRICK AFB, FLORIDA



Along Florida's Space Coast from which the vast Atlantic stretches east, the journey to space began years ago and continues today. Operations at the 45th Space Wing (45 SW) are conducted amid the sensitive habitat of several protected wildlife species.

Headquartered at Patrick Air Force Base (PAFB) with launch operations at nearby Cape Canaveral Air Force Station (CCAFS), the wing has been the backbone of the nation's space program for more than 50 years. Acting as the East Coast spaceport, the 45 SW implements the Air Force (AF) vision of space power and remains a critical component of a lean, yet effective national defense force. The Eastern Range supports the AF, Army, Navy, NASA, foreign governments, European Space Agency and various private industries. It includes 15,800 acres at CCAFS, 2,108 acres at PAFB, extends 10,000 miles downrange and encompasses 15 million square miles.

A variety of satellites are processed and launched on expendable space launch vehicles. The wing's global importance is underscored by the 3,346 space launches to date with 28 launches occurring during the last two fiscal years.

Coupled with the 45 SW's primary mission of enhancing national strength by ensuring access to space, all 2,150 active duty, 1,850 civil servants, 7,150 contractors and more than 35 tenant units are committed to environmental excellence and protecting unique resources.

Brevard County or Florida's 'Space Coast', is home to the 45 SW with 23 communities and a population of 450,000. Fortune 500 companies, hi-tech corporations, medical businesses, educational facilities, aerospace companies, commercial and light industry and tourism are all part of the Space Coast. The 45 SW is one of the top 10 employers in the sixth fastest growing metro market in the nation. A corporate citizen, the 45 SW's impact to the local economy exceeds \$1.2 billion in jobs created, construction expenditures and payroll.

BACKGROUND

The environmental setting of the 45 SW is nearly as unique and multi-faceted as its mission and provides many challenges in managing and maintaining the fragile balance between hazardous

rocket operations and rare natural and cultural resources. Home to 71 protected wildlife and plant species, PAFB and CCAFS cover nearly 18,000 acres of sandy beaches, coastal sand dunes, wetlands, coastal scrub and woodlands. The installations are located on a barrier island in central Florida between the Banana River Lagoon and the Atlantic Ocean on mostly undeveloped land within a highly developed area of the state. This is mainly due to safety and security zones around critical facilities and launch complexes.

Organization, Staffing, Management

The environmental flight has 28 employees and is augmented by 17 contractor personnel. This team synergistically manages and considers every aspect of the environment at PAFB, CCAFS, Antigua Air Station (AS), Ascension Auxiliary Airfield (AAF), Malabar Transmitter Annex and Jonathan Dickinson Missile Tracking Annex. The 45 SW management approach is to assure access to space while proactively preserving and protecting the environment. The wing actively strives to identify potential problems before they occur and mitigate those using "tried and true" or innovative solutions.

Education of personnel, both on and off base, is crucial to the success of the 45 SW environmental programs. The wing and the local community are equally committed to protecting our environmental heritage now and long into the future.

Challenges

Operating the most active space launch complex in the world, while protecting and preserving the environment is clearly the 45 SW's greatest environmental challenge. The wing successfully maintains a proper balance between operational, legal, weather and environmental constraints.

In addition to "hi-tech" mission influences, the 45 SW constantly battles Mother Nature. Mission critical resources and 14 miles of beachfront are extremely vulnerable to tropical storms and hurricanes. High temperatures and periods of sparse rainfall create wildfire concerns, while the continuous onslaught of salt air corrodes critical facilities.



Air Force and Community Boards, Partnerships

The Installation Restoration Program (IRP) partnering team is a model for bases around the world. Creating mutual respect, the team includes members from DOD, Florida Department of Environmental Protection (FDEP), the Environmental Protection Agency (EPA) and contractors. The team’s productivity sets the standard for all US EPA Region IV and partnering teams throughout DOD. The 45 SW Restoration Advisory Board hosts 24 members, meets quarterly and plays an active role in cleanup activities. As stakeholders and liaisons between the community and the AF, the board provides essential two-way flow of communication regarding the IRP and other environmental issues.

The dynamic compliance partnering team promotes trust and understanding between regulatory agencies and the AF. The team, including the wing, NASA, FDEP, St. Johns Water Management District and Brevard County, streamlines the permitting process and promotes information exchange.

The 45 SW Environmental Protection Committee (EPC) ensures compliance and promotes the protection and preservation of the environment while the joint 45 SW/NASA Environmental Process Team works to solve unique problems encountered at both CCAFS and Kennedy Space Center with invaluable cross feed.

PROGRAM SUMMARY

The overall objective and the most outstanding feature of the 45 SW’s environmental program is to support the wing’s space mission while operating under an ecosystem management approach that focuses on sustainability, biodiversity, adaptability and accountability. Given the highly technical space mission, six geographically separated

installations, 35 tenant units, three national governments and multiple ecosystems, a strong environmental commitment keeps the wing in compliance with federal, state, local and foreign government laws and regulations.

The 45 SW conquers this monumental challenge through proactive management of highly regulated and uniquely intricate environmental management programs. Included in its arsenal is the wing’s Environmental Management System (EMS), an overarching management tool used to guarantee all environmental impacts are identified and considered.

Recognized for outstanding achievement, the wing’s goals are to maintain compliance with regulatory requirements, provide exceptional natural and cultural resource management, exceed pollution prevention metrics, restore past contamination and be good community neighbors.

The program exceeds statutory and regulatory requirements by ‘going the extra mile.’ Personnel seek better, more efficient ways to accomplish tasks through innovative technologies and partnering with other knowledgeable federal, state and local agencies.

The wing has the following plans in place:

PLAN/AGREEMENT NAME	DATE
Storage Tank Management Plan	1998
Pollution Prevention Management Action Plan	1999
Integrated Solid Waste Mgt. Plan (under review)	1999
Petroleum Cleanup Agreement with FDEP	1999
Integrated Natural Resources Management Plan	2001
Integrated Cultural Resources Management Plan	2004
Petroleum Products/Hazardous Waste Mgt. Plan	2005
PCB Plan	2005
Integrated Pest Management Plan	2005
IRP Management Action Plan	2005
Spill Prevention Control & Countermeasures Plan	2005
Facility Response Plan	2005
Affirmative Procurement Plan	2005
Asbestos Management Plan	2005

ACCOMPLISHMENTS

EMS Implementation

The wing’s fully implemented EMS provides a key management tool ensuring environmental actions are considered early in every wing decision. The environmental policy statement was updated and the implementation plan, including responsibility, training, documentation and legal matrices to assist coordinators, was finalized.

A Cross Functional Team (CFT) developed the aspect inventory using the Enterprise Environmental Safety Occupational Health Management Information System database. The CFT systematically identified more than 500 environmental aspects with water quality and wastewater identified as significant based on their potential mission impact and regulatory implications. Environmental management plans were developed for each of these aspects implementing operational controls and to continuously track performance measures over the next five years.

EMS awareness training was provided to current employees and is fully integrated in the newcomer's briefing while management review and senior leader training were completed through the EPC.

Signing of the self-declaration letter formally implemented the system ahead of the AF goal of 31 December 2005 and the wing is now working toward full conformance and continuous improvement in environmental management.

Pollution Prevention/Waste Reduction

Monumental efforts diverted 254.4 million pounds of solid wastes from landfills. More than 14.4 million pounds of paper, cardboard, magazines, glass, plastic and aluminum and approximately 210 million pounds of concrete and asphalt were recycled. This program achieved a spectacular 72% diversion rate, well above the AF goal of 40% and avoided nearly \$1.8 million in disposal costs.

Aggressive Affirmative Procurement (AP) and Green Procurement Program (GPP) implementation resulted in the purchase of 1,200 recycling containers made of 100% recycled material. Innovative training efforts helped educate 1,500 people on AP and GPP.

Always looking for better ways to preserve the environment and save money, personnel determined that non-hazardous baby oil could shine stainless steel as effectively as Sheila Shine that contains trichloroethane and xylene. This substitution saved 55.4% in hazardous material purchases.

Meticulous research led to the management of dental amalgam waste as a recyclable metal thus

eliminating a hazardous waste stream.

Procurement of an advanced X-ray developer for non-destructive testing of rocket parts reduces hazardous waste by 50%, decreases maintenance, uses fewer chemicals and saves disposal costs.

A \$200,000 study evaluated sustainable corrosion control for coastal launch complexes. Switching to replacement coatings with low or zero volatile organic compounds reduced hazardous material use, hazardous waste generation, air emissions and disposal costs.

Environmental Compliance Assessment and Management Program (ECAMP) and Compliance

Uniquely different, the 45 SW ECAMP program is unprecedented in scope, consisting of four assessments annually, covering six installations. Five comprehensive internal audits by wing personnel and three external audits by AF Space Command were completed during the award period. In 2005 alone, 55 assessors visited 400 facilities/sites, reviewed hundreds of documents and interviewed 250 people.

Rising to the challenge, personnel closed 33% of findings at PAFB and CCAFS within a month of the assessments. Incredibly, Antigua AS and Ascension AAF closed 41% and 49% of findings, respectively, within two months.

ECAMP training is conducted and assessment workbooks were developed. The 45 SW was the first in command to establish an Environmental Assessment Training & Tracking System (ECATTS) website ensuring personnel have easy access to web-based training customized to each individual's job codes. ECATTS training requirements are being incorporated into contract specifications.

Showing the value of ECAMP, the wing ached more than 1,600 inspections each year with no open enforcement actions from state inspections at 337 facilities. An in-house database tracks compliance of 845 permits, drastically reducing vulnerability.

A recognized expert, the wing's hazardous waste manager helped draft Military Munitions Rule language for the Florida



Administrative Code benefiting DOD and police organizations in Florida.

The consumptive use well inventory was updated with 40 site visits and new identification cards. Flow meters were calibrated and a maintenance plan developed. A new water conservation plan, eliminating about 150 wells, was included with the five-year permit compliance report and submitted using a new, simplified, reporting process.

An abandoned, historic launch tower was successfully demolished, disassembled and buried in the CCAFS landfill saving more than \$1 million in off-site disposal costs. PCB and lead contaminated soil removal is now underway. Personnel consulted with the Florida State Historic Preservation Officer (SHPO) to obtain formal concurrence and the consultation package was lauded as the most comprehensive document ever received.



Proactive initiatives resulted in elimination of five industrial wastewater permits and related compliance costs by routing all launch deluge wastewater to sewer rather than to groundwater. This action saves \$100,000 annually and reduces launch turnaround time.

Personnel ingeniously eliminated the need to purchase 24,000 gallons/year of hazardous sodium hypochlorite by redesigning the water disinfection system using on-site salt/electrolysis generation.

Avoiding hidden dangers of repeated fuel releases, an improperly abandoned, 3.2 mile, 1940s era, underground fuel piping system was removed. This \$1.3 million project mapped the pipeline layout, properly removed/capped remaining pipe sections and removed contaminated soil and groundwater leaving a 5.2 acre site for future construction.

Effective Use of Funds

The 45 SW secured and executed \$230,000 in end-of-year funds to comply with the imminent Spill Prevention, Control and Countermeasures rule. Secondary containment areas were proactively planned, designed and constructed prior to rule implementation. In addition, personnel modified portable generator operating procedures to prevent spills from reaching surface waters and to avoid purchasing \$40,000 in secondary containments.

Several initiatives saved the wing valuable compliance dollars. Approximately 5,000 gallons of diesel fuel was recycled saving \$9,500 in purchase costs for new fuel and disposal of the old. Dynamic coordination with the state eliminated an industrial wastewater permit for a cooling tower, saving about \$25,000 a year. Personnel resourcefully applied for a Department of Transportation exemption to ship waste aerosol cans in 55-gallon drums that exceed the 66 pound weight limit, thus saving \$66 per drum. Roughly \$10,000 was saved when an out-of-service storage tank was recycled.

A \$2 million project to improve lines-of-sight and increase CCAFS security clear zones simultaneously enhanced habitat for threatened and endangered (T&E) species through skillfully managed project planning by environmental personnel. Innovative land clearing methods improved habitat of threatened Florida Scrub Jays while enhancing security and creating firebreaks. Environmental personnel proactively partnered with the US Fish and Wildlife Service (USFWS) to establish a compromise when security concerns required additional land clearing.

The 45 SW took giant strides forward with a \$1.5 million survey to update the asbestos inventory for 550 facilities. In cooperation with the AF Center for Environmental Excellence, a prototypical, asbestos database was developed to allow all personnel access.

To optimize spill avoidance and pursue the AF zero industrial wastewater discharge goal, the 45 SW initiated a multi-million dollar program to identify all oil water separators and remove all non-mission devices. A cost effective, phased approach resulted in removal of 25 oil water separators and 33 septic systems to improve water quality and reduce enforcement vulnerability.

Florida golf courses are subject to a wide variety of insects, fungus, nematodes, scale and viruses. To

effectively combat these foes, a pilot program involving 22 pesticides was initiated and approved by the Armed Forces Pest Management Board.

National Environmental Policy Act (NEPA)

Integrating environmental analysis into leadership decision-making is the first step toward protecting environmental resources. In the last two years, personnel reviewed more than 4,000 projects and 226 site plans for potential environmental impacts, and developed 19 environmental assessments (EA).

By conducting NEPA analysis early in the planning process, all environmental issues and legal requirements are identified well before final design.

Working better, smarter and faster, personnel developed three programmatic EAs that streamlined the environmental analysis process for land clearing, tower construction and training. Personnel creatively configured the base General Plan EA to assess cumulative impacts of the 5-year construction plan.

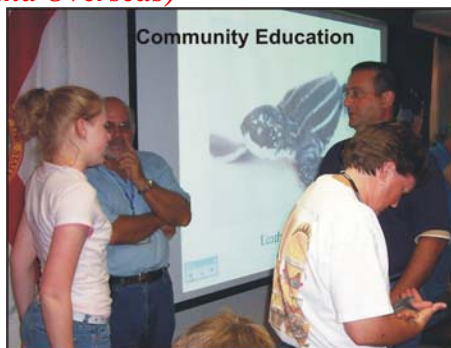
The wing partnered with the Brevard County Economic Development Council who funded \$200,000 for a programmatic EA on potential reuse of 13 launch complexes. This EA saves valuable time for new mission programs coming to the 45 SW.

Environmental personnel maintain an excellent relationship with the USFWS and the National Marine Fisheries Service (NMFS). Consultations with NMFS on six projects in state waters adjacent to the base ensured no adverse impacts to seagrass, rock reef or protected marine species such as sea turtles, whales and manatees.

In support of mission critical construction, 20 Endangered Species Act consultations with the USFWS were completed, all with favorable biological opinions, no negative impacts to T&E species and no project delays.

Community Relations (CONUS and Overseas)

Attacking problems head-on, the 45 SW was first in the county to accomplish beach restoration after three hurricanes eroded beaches of one of the most popular destinations on the East Coast. The \$4.3 million project pumped 300,000 cubic yards of beach quality sand from offshore, then



reconstructed and revegetated the dunes. Quick action to complete the NEPA analysis, consult with federal agencies and obtain permits ensured protection of key facilities and project completion prior to sea turtle nesting season.

The 45 SW spearheaded six beach cleanups at three locations and coordinated 600 volunteers to comb 22 miles of beach and remove 30 tons of trash with 40% recycled. Leading the way for the wing's host nation, the 45 SW organized the first Ascension Island beach cleanup that is now an annual event.

Flight personnel authored and published 15 newspaper articles; conducted 12 speaking engagements; set up displays at 24 on and off-base events; and presented three technical papers on base cleanup/innovative technologies/site investigations.

Striving to educate the community, personnel participate in a wide variety of events. The 45 SW supported the third largest birding festival in the US, a national ecotourism event for 500 Boy Scouts, functions during Native American Heritage month and conducted several sea turtle beach walks. The newest initiative is the environmental reading program at elementary schools where the focus is on conservation education to help promote awareness.

The 45 SW environmental staff is frequently called upon to voluntarily assist with catching and transporting injured wildlife to local rehabilitation centers earning respect from the local community.

Rising above the rest, PAFB and CCAFS hold the distinction as the first AF Space Command base to achieve the National Arbor Foundation Tree City status and hold it for 12 consecutive years.

A win-win partnership with our recycling contractor, a National Industries for the Severely Handicapped contractor, provided 80 individuals with life-altering work experience and skills while supporting an award-winning recycling program.

Establishing cultural ties, the wing worked closely with the Miccosukee Indian Tribe to repatriate human remains on CCAFS since the tribe trusts the AF to protect their sacred remains.

Natural and Cultural Resources

The 45 SW is home to 71 protected wildlife and plant species and has comprehensive programs for

protection of T&E species, migratory birds and cultural resources.

Roughly 3,500 sea turtle nests are deposited on 45 SW beaches annually. Daily monitoring is conducted during the nesting season to collect data and ensure protection for several T&E species. The wing is an active participant in the Florida Fish and Wildlife Conservation Commission Index for sea turtle nesting and has met recovery goals every year! The wing's aggressive light management plan helps minimize hatchling disorientation by reducing artificial lighting. Recent projects for beach restoration, dune reconstruction and removal of 26 tons of 50's-era steel and concrete from the beaches enhanced nesting habitat. An outstanding hog and raccoon trapping program helped reduce sea turtle nest depredation rates from 43% in 2003 to 10% in 2005 for raccoons and from 12% to 0% for feral hogs.

A wildlife paradise, CCAFS has more than 7,000 acres of scrub oak habitat extremely important to the threatened Florida Scrub Jay and other wildlife. To enhance habitat and minimize wildfires, the wing continues to execute a successful prescribed burn program. More than 1,000 acres of overgrown scrub was treated to reduce vegetative fuel loads adjacent to critical 45 SW facilities and enhance habitat for wildlife. Expert land management by the AF helped increase the population of the threatened Florida Scrub Jay by 12% in 2005.

Preserving cultural assets for future generations is a responsibility the 45 SW takes very seriously. Two significant archeological finds were discovered on CCAFS in July 2005. The 45 SW funded a study to locate the original 1847 lighthouse and to identify a formerly unknown Native American settlement that will be protected now and in the future.

To preserve our nation's history, the 45 SW rescued a one-of-a-kind, severely corroded 'clean room' from America's 'Man in Space' era. This four story structure was refurbished and relocated to the

AF Space and Missile Museum as an interpretive outdoor historical display.

Resourcefully using in-house skilled craftsman, a \$37,000 historical restoration project on the WWII Catholic Grotto on Ascension Island was completed.

Installation Restoration Program (IRP)

The 45 SW IRP lives up to its motto of "protecting the future...restoring the past." Through this program, a phenomenal 314 comprehensive preliminary site assessments were completed with 38% requiring no further action.

Completion of seven indoor air surveys determined the extent of Dense Non-Aqueous Phase Liquid (DNAPL) vapors on indoor air quality. Partnering with local university professors, sites were delineated and cleanup options evaluated. Leading edge technologies were used to treat 50,000 cubic yards of contaminated soils while extracting 13,300 pounds of spent solvents.

Innovative technologies are home to the 45 SW. At another site, 63,000 gallons of emulsified zero-valent iron particles were injected into a DNAPL solvent source with 6,500 gallons of food-grade vegetable oil added to sequester contaminants and enhance the natural, reductive dechlorination at the industrial site.

These efforts opened the door for re-activation at two launch complexes for new prospective launch programs at CCAFS, the 'world's premier gateway to space.'

The dynamic IRP partnering team developed a prototypical template for final clean-up and land use control plans to streamline project approvals.

COMMITMENT

The 45 SW is committed to protecting, preserving and restoring the environment while supporting the nation's space mission. These exceptional environmental stewardship programs continue to grow and expand ensuring vital resources are here for generations to come. This commitment can be summed up with one phrase:

"Our mission is space; our responsibility, the earth"

