

# ENVIRONMENTAL AWARDS

*ENVIRONMENTAL QUALITY OVERSEAS AWARD:  
SPANGDAHLEM AIR BASE*

## INTRODUCTION

Spangdahlem Air Base (SAB), Germany is home of the 52nd Fighter Wing (52 FW) and approximately 5,560 active-duty members, 650 foreign national civilian employees and 210 Department of Defense civilians. The installation is 1,763 acres of land nestled in the rural agricultural Rhineland-Palatinate region between Binsfeld and Spangdahlem villages. The wing is comprised of five groups whose roles include operations, maintenance, mission support, medical operations and headquarters staff. The 52 FW maintains, deploys, and employs F-16 and A-10 aircraft and TPS-75 radar systems in support of NATO and combatant command authorities to provide expeditionary combat capability in mission areas of suppression of enemy air defenses, close air support, air interdiction, counter air, air strike control, combat search and rescue, and theater airspace control.

## BACKGROUND

SAB receives environmental guidance from Germany's Federal Ministry of Environment, Nature Protection & Nuclear Plant Safety, Rhineland Palatinate (RLP) Department for Environmental Protection, and RLP Labor Inspectorate. Regulators include Structure & Approval Management Administration North (SGD-Nord Koblenz and Trier Offices, Upper Water Authority), state regulators for storm water discharge permits including the Waste Water Treatment Plant discharge, and drinking water pumping permit. In conjunction with SGD-Nord, SAB works with two County Administrations located in Bitburg-Pruem and Bernkastel-Wittlich (Lower Water Authorities). From these counties we obtain permits for our compact wastewater treatment plant discharges and coordinate installation and deactivation of oil/water separators. SAB is subject to German Ministry of Defense who issues guidance and regulations on air traffic control, air traffic noise, and air emissions. Both SGD-Nord and the military regulators inspect SAB regularly to enforce permits and environmental compliance standards in accordance with German laws.

SAB is unique as it pumps, pre-treats, distributes, treats, and discharges the entire water cycle in-house. Water is obtained from groundwater aquifers of the Kailbach and Grosslittgen Creeks and wastewater is discharged to numerous surrounding creeks which feed into the

Salm and Kyll Rivers. Numerous downstream villages including the oldest city of Germany, Trier, which is 100,000 in population, pull their drinking water from these sources. Effective environmental management of SAB's twelve storm water discharge locations and 59 groundwater monitoring wells are of critical importance to ensure we minimize pollutant release into community water systems.

## ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

SAB utilizes the EMS as an efficient framework for organization of environmental issues and Cross Functional Team (CFT) focus on ensuring regulatory compliance across all environmental aspects. Additional emphasis has been placed on three Significant Aspects (SA) including waste reduction, energy conservation, and unintended discharge elimination. Each SA was assigned a working group to establish Environmental Action Plans (EAPs), specify objectives, develop targets, delegate roles with responsibilities, estimate completion dates and ensure continuous improvement utilizing the Plan/Do/Check/Act model.

### **Significant Aspect 1: Unintended Discharge**



Shown here is the South Deicing System, approximately 75% of aircraft deicing runoff flows through here. Two diverting structures are used to detect high concentrations of deicing chemical and POL. Non contaminated water is diverted directly to the storm water basin to be released into the Linsbach Creek and the contaminated water is routed 2.5 miles through the catch basin to the Waste Water Treatment Plant.

Unintended discharge to land and surface water was determined a Significant Aspect due to the wing's mission, cold weather climate, potential for community concern, and environmental risk. Numerous drainage areas capture runoff from airfield pavements and often contain deicing chemicals and paints, oils, and lubricants (POL) during winter season. Limited capacity of retention basins presents risk of runoff contaminating local streams. Due to our unique geography and geology, Host Nation discharge permits only allow non-reportable discharges with a Chemical Oxygen Demand (COD) level below 90 parts per million (ppm). Because repeat reportable instances can result in Host Nation enforcement actions, the CFT identified 29 Environmental Action Plan projects worth \$21 million to achieve compliance at all 12 discharge locations. The CFT is also researching alternate surface deicing products such as formate-based applications to replace current acetate based surface deicing chemicals that will reduce COD levels by up to 70%. Coordination with the Air Force Civil Engineer Center (AFCEC) and other Air Force organizations is on-going. Another \$460,000 project to install safe drains on a 20,000 square meter ramp and vacuum truck purchase allows single-source, high concentration contamination capture directly at the source, minimizing aircraft deicing discharge risk.

The CFT also identified areas to minimize and decrease potential POL spill risk. Sixty of 76 refueling hardstands in front of Hardened Aircraft Shelters (HAS) are permeable due to cracked concrete and degraded joint sealant. Per Air Force regulations and German policies (Water Act and DWA-A 784), refueling/defueling operations of Aircraft on permeable surfaces is prohibited. As repair of existing hardstands continues, Aircraft Maintenance Units (AMUs) are forced to tow aircraft to refurbished HASs every refuel/defuel operation, with an estimated 1.5 man hours per tow. To alleviate excessive manpower requirements, mobile containment devices were purchased and placed under aircraft Single Point Receptacles during fueling operations. Devices act as an impermeable/sealed surface, contain fuel releases while coupling/decoupling hoses, and provide interim fulfillment of Air Force and host nation (HN) regulations until project completion. This solution cuts manpower requirement by 67%, saves approximately \$256,000 per year in equipment maintenance and repair, and saves approximately \$389,000 on aircraft push-backs and repositioning.



Mobile Spill Berm used during fueling operations creates an impermeable surface. It's a temporary solution while refueling hardstands are under construction. Without the use of these spill berms, it would take the AMUs 1.5 man hours to tow an aircraft one way to approved locations.

SAB operates and maintains 109 Oil Water Separators (OWS) connected to POL areas, HASs, gas stations, aircraft and vehicle maintenance facilities, and wash racks to prevent POL releases to the base. After comprehensive review, 43 were determined non-mandatory by US and German regulations and are negotiated for decommissioning with HN regulators. OWS are inspected every two and half years in water protection zones and every five years in remaining zones and are continuously maintained. The average repair and maintenance costs in a five year period for one OWS is \$25,000. Total savings upon completion of decommissioning is estimated at \$215,000 annually.



Along with OWS decommissioning, decommissioning fuel tanks reduces maintenance and inspection costs. Removing unused fuel tanks eliminates high risk environmental aspects. It also enables minimal contamination goals to be met.



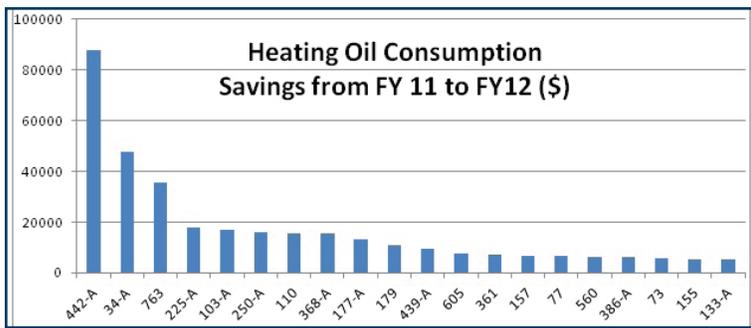
Members of the spill response team showcase their knowledge on Simulated 5,000 gallon fuel spill exercise organized by Sandra Rinder. This yearly training guarantees initial responders will react quickly to minimize impact during an emergency situation. Fuel spills, large or small, contaminate the soul and water.

Additional objectives to eliminate pollution to surface waters include repair and containment of Aerospace Ground Equipment (AGE) and back-up power generators at open storage pads. Eighty containment devices were purchased for AGE/Power-Pro equipment totaling \$156,000. Devices are equipped with PETRO-Pipes allowing rain water to drain from placement under equipment. During rain events, PETRO-Pipes filter out clean water eliminating the need to physically drain the berms. This solution closed a major ESOHCAMP finding and an Operational Readiness Inspection (ORI) deficiency. Utilization further eliminates potential for future clean-up sites.

In addition to infrastructure improvements, Environmental staff completed a 5 year update to the outdated spill plan. A site specific spill plan was implemented in both German and English for 25 high risk locations which resulted in zero HN permit violations. Staff trained 14 shops on drainage areas, OWS, spill kits, and procedures for containment and cleanup of minor spills. United States Air Forces in Europe (USAFE) benchmarked the initiative and contracted training for spill prevention and minor spill response at other installations. Major spill response training is a yearly environmental requirement which is planned and organized with DLA. A one day classroom training course is conducted for all initial response personnel. Topics cover US and German regulations, handling HAZMAT, and proper notification requirements to US and HN authorities. Training increased communication and team cohesion and directly contributed to zero major incidents over the last three years.

### **Significant Aspect 2: Energy Conservation**

The second Significant Aspect is energy conservation. Executive Order 13423 and 13514 address energy conservation and related sustainability efforts, and mandate a 30% energy intensity reduction by 2015. By focusing on efficiencies in electrical, heating, greenhouse gases, vehicle petroleum, procurement, and building utilization, the base anticipates meeting base energy intensity reduction mandates. Over the 10 year duration of the policy, energy costs have increased 300% due to open market fluctuation and Euro exchange rates. In FY12 energy costs were \$15 million. In an effort to eliminate inefficiency, heating consumption analyses are ongoing in facilities with individual boilers. If all 65 facilities analyzed operated at 150 kWh/m<sup>2</sup>a, the average German heating benchmark for occupied facilities, a potential \$1.3 million could be saved. Engineering personnel identified 21 facilities consuming more than 330 kWh/m<sup>2</sup>a, well above this benchmark. New cost solutions were implemented to include behavioral change education materials which included Facility Manager training on conservation methods such as door/window management, proper management during operating hours, and reduction emphasis during non-operating hours. Efforts over the past year have generated a \$411,500 in utility savings. Temperature spot checks are performed periodically to ensure efficient energy use and continual awareness training is provided to users.



Graph displays savings in energy consumption over the past year. By efficiently managing building envelope, 21 facilities accomplished a total savings of \$412K. Continually educating occupants on conservation will help increase savings.

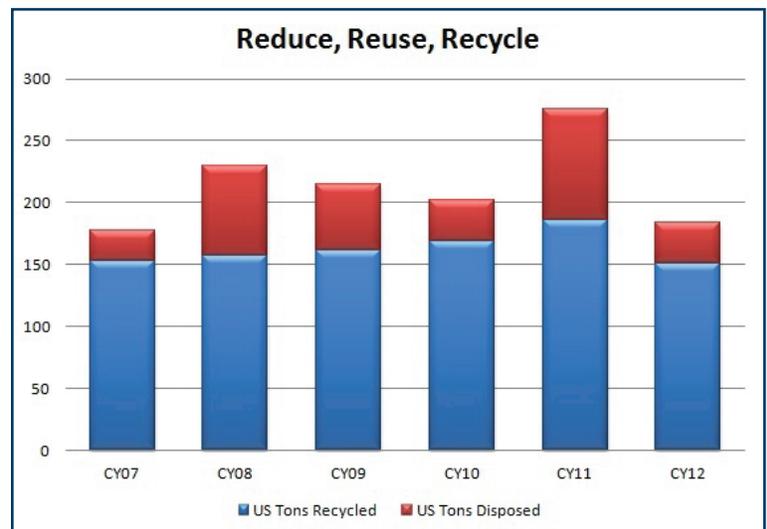
Additional infrastructure improvements include recent completion of a \$458,000 load optimizing system at the base electrical feeder station. During peak energy production times, the load optimizing system peak shaves total consumption from SAB’s utility provider. The project is projected to provide annual savings of \$46,000 with a payback period of 10 years.

Since the installation of leak detection systems in 2003, SAB continues to make significant base-wide upgrades and improvements to the water distribution system. SAB has continued replacement of laterals and approximately 99% of water lines are complete. All water line components have been standardized to simplify operations and assist maintenance personnel in implementing quick repairs. All valves and fittings have been located using Global Positioning System (GPS) equipment. Leak detection equipment is attached to staff vehicles to enhance the efficiency in their performance of daily maintenance responsibilities. This integrated system has improved water conservation efforts by eliminating significant water leaks.

Water reduction efforts have allowed SAB to source 75% of annual consumption from Kailbach wells. Kailbach wells are located 1 km from base with peak load provided from Grosslittgen pumps and infrastructure located 7 km from base. To further reduce consumption from these sources, a cistern will be built at the North-West expansion area to eliminate drinking water usage for irrigation. Continued emphasis on low-flow fixtures for renovations and new construction further enhances water conservation goals. Ongoing efforts to further reduce water consumption have a direct impact on energy and pre-treatment saving by sourcing from a nearer point.

### Significant Aspect 3: Solid Waste Reduction

Because SAB operations generate a variety of hazardous and non-hazardous solid and liquid wastes, the third Significant Aspect focuses on Waste Diversion. Objectives focus on minimizing waste generation, maximizing reuse and recycling opportunities, increasing awareness with education, and maximizing marketing to encourage waste reduction. A main target is to reduce use of plastic bags on base as they generate potential airfield foreign object damage (FOD) problem and are not accepted by Host Nation recycling programs. Reusable cotton “Green Bags” were purchased and distributed to every Military Family Housing and Unaccompanied Housing resident. 3,000 bags have been distributed during newcomer’s briefings, Earth Day, and America Recycles Day activities. In addition, base agencies who implemented an internal recycling program were given recycling containers to increase collection and separation of paper, tin, and plastic recyclable items. Collection points for batteries, CD/DVDs, and cooking oil have been placed at various locations as well. Rechargeable batteries with rechargers were purchased and made available for base agencies to reduce this waste source.



The fluctuation in hazardous waste disposal vs. recycling can be attributed to squadron missions/deactivations. However, it should be noted that over the past five years, disposal of hazardous waste has decreased significantly. The only way to reduce hazardous waste is to purchase environmentally friendly materials, i.e. rechargeable batteries.

A vigorous 3-day training on Hazardous Waste/Solid Waste programs for 290 people was conducted which contributed to a 35 % reduction in ESOHCAMP findings from the 2009 Tier III inspection. Twenty eight findings were closed and 43 projects worth \$8 million were programmed to correct remaining deficiencies. Additionally, 150

Hazardous Waste POCs received initial/annual refresher training in FY12. Training consists of hazardous material life cycles, German Final Governing Standards, SAB Hazardous Waste (HW) Management Plan, HW storage requirements, Health and Safety Training, and pollution prevention. Training and awareness programs contribute to reduced findings, minimize risk of occupational accidents, ensure proper disposal procedures are documented, and ensure HW is stored appropriately to minimize health and environmental risks.

SAB implemented a first ever base-wide Green Procurement Plan. The plan has allowed the base to meet sustainability goals in accordance with Executive Orders 13423/13514. Green procurement training and best practices were pushed to all Government Purchase Card (GPC) holders, design agents, repeat vendors, and contracting officers. This effort combined with Leadership in Energy and Environmental Design (LEED) for construction activities forwards sustainable procurement goals.

### **COMMUNITY INVOLVEMENT**

On Earth Day, Environmental staff taught 60 Middle School students Environmental Science, on/off base recycling practices, significance of natural resources, and regional threatened and endangered species. Additionally, 50 SAB students, boy scouts and villagers participated in a 5 Km clean-up of Spangerbach Creek. They recovered 25 bags of trash, abandoned vehicle parts, etc. Also during Earth Day, Wing leadership and 40 elementary school students planted 60 trees on base.



Franz Steffes, 52 CEAN, is assisting children from Spangdahlem Elementary School to plant trees during Earth Week. Leadership, students, and 52 CES all contributed to planting 60 trees around base. Earth Week is an annual event that brings the community together to plant trees and clean local streams.