

**2019 CHIEF OF NAVAL OPERATIONS ENVIRONMENTAL AWARD
NAVAL MAGAZINE INDIAN ISLAND, PORT HADLOCK, WASHINGTON
SUSTAINABILITY
NON-INDUSTRIAL INSTALLATION**



INTRODUCTION

Naval Magazine (NAVMAG) Indian Island is located within the marine waters of Puget Sound at the northeast corner of the Olympic Peninsula in Jefferson County, Washington, southeast of the city of Port Townsend. The installation is bounded by Port Townsend Bay on the west and north, Oak Bay and Portage Canal to the west and south, and Kilisut Harbor to the east. It consists of 2,716 acres, with approximately 2,100 acres of forested lands and 137 acres of intertidal shoreline. NAVMAG Indian Island functions as the ordnance management center for fleet and shore stations in the Pacific Northwest region. The installation provides quality and responsive logistics, technical and material support in the areas of retail ammunition management and ordnance system components maintenance. We provide technical support of ordnance and ordnance-related equipment and processes, and logistics management as the only active breakbulk and containerized ordnance transshipment port in support of the joint services of the Pacific command.

NAVMAG Indian Island is inhabited by a resident population of over 300 Black-tailed deer, 10 pairs of nesting Bald eagles, Great Blue heron rookeries, Pigeon guillemot colonies, River otter dens, owls, coyotes, black bears and cougars. Additionally, the island has over 17 known Native American archaeological sites, several historic homestead sites and a World War II historic district.

Historically, Indian Island was a seasonal clam and fish gathering area utilized by the Chemakum tribe on the Quimper Peninsula, from their villages located at Hadlock, Irondale and Discovery Bay. The first European immigrants settled on Indian Island in the late 1860s. When the Navy purchased the island in 1939, there were 94 residents living on Indian Island.

BACKGROUND

The sustainability program at NAVMAG Indian Island is managed and accomplished through a team approach consisting of the Environmental, Facilities and Ordnance branches that work collaboratively with the Regional Resource Efficiency Manager and Regional Energy Program Manager. This team's objective is to identify areas and opportunities throughout the installation to implement energy efficiency projects and initiatives. Additionally, this effort is supplemented

with a robust Environmental Management System (EMS) team that utilizes a proactive approach to develop targets and objectives and implement strategies for accomplishment of these goals. By developing a plan of action and milestones (POAMS) within the EMS system, various media managers are able to complete these initiatives and projects – many of which were designed to comply with E.O. 13834 and the Department of Defense Strategic Sustainability Performance Plan.

SUMMARY OF ACCOMPLISHMENTS

Employee Training

NAVMAG Indian Island employees are given annual environmental briefings on various environmental media including recycling, pollution prevention, hazardous waste minimization and product substitution. Additionally, a monthly newsletter is published and distributed that contains tips on energy conservation measures for both the work place and home to better inform employees on ways to reduce energy consumption and minimize waste streams. Yet another means of communication is the annual Energy Conservation week initiative coordinated by the Navy Region Northwest Office, which provides installation employees with handouts and brochures. These informational guides provide detailed information on energy saving measures that can be implemented at home and in the office.

Energy Efficiency

In October 2016, the installation completed construction of a shore power distribution system project (MCON P-603) that installed more than 7 miles of power lines connected to the Jefferson County Public Utilities District grid to supply electrical power to vessels berthed at the Ammunition Wharf. This new shore power system replaced two 420 kilowatt diesel-driven electrical generators provided by the Mobile Utilities Support Equipment (MUSE) branch of Naval Facilities Engineering Command (NAVFAC). During the construction phase where the power lines crossed high value habitat within a riparian wetland corridor, the distribution line was installed underground, in lieu of overhead utility poles, within the existing roadbed in order to mitigate and avoid impacting the wetland vegetation, hydrological functions and hydric soils. Additionally, the design included utility poles that were configured with avian-safe phase conductors separated by a distance of 60-inches in accordance with the 2016 U.S. Fish & Wildlife Service Avian Protection Plan guidelines. This avian-friendly design feature prevents electrocution and electrical hazards to all birds – particularly larger species such as Bald eagles, Great Horned owls and Great Blue herons all of which are known to inhabit and nest on the installation. The system was energized and brought online in August 2017 and reduces fuel consumption by an average of 65,000 gallons annually and reduces CO2 emissions by 1,456,000 pounds per year based on this average run time. Additionally, the new shore power system no longer requires a crew of operators and mechanics as was the case with the MUSE generators. Additionally, the removal of the generators scaled down the installation from a Synthetic Minor Clean Air Act Title V facility to a Natural Minor facility thereby reducing the annual cost of the operating permit by \$1,151 in FY2017 and FY2018.



Photos 1 & 2: Shore Power Underground Wetland Buffer and Avian-Safe Phase Conductors

In FY 2017, 505 permanent incandescent and fluorescent light fixtures throughout the installation were replaced with LED lighting. Additionally, occupancy sensors were installed in offices, corridors and lunch rooms. Overall, this project resulted in a reduction in energy consumption of 450 megawatt hours per year and an annual cost savings of \$36,000.



Photo 3: LED Light on Building 77 Warehouse

In August - September 2017, the installation's headquarters and the Waterfront Operations building received renovations that included the replacement of single pane windows with energy efficient storm windows. This project has resulted in an annual overall reduction of heating fuel consumption by 204 million British thermal units (MTBU) and a cost savings of \$4,400. Additionally, all of the aluminum frames that were removed from the old windows were recycled by the construction contractor.

In July - August 2018, an energy conservation project for the Armory, Gymnasium and Vehicle Maintenance replaced heating boilers with heat pumps, which resulted in an overall annual reduction of 3,188 MBTUs, 28,000 gallons of diesel fuel and \$85,300. This project also reduced annual CO2 emissions by 627,200 pounds. Additionally, fewer mechanical failures as a result of these heating system upgrades have resulted in more reliable heating in these occupied buildings for employees.

A modern Industrial Control System (ICS) was installed throughout the installation as part of a utilities upgrade which began in FY2015 and was completed in FY2017. Overall, a total of 14 inhabited buildings were upgraded to enable the thermostats to be controlled remotely from the Regional Control center at Naval Base Kitsap – Bangor, which resulted in an overall reduction of 1,846 MBTUs, 686 megawatt hours, 794,000 gallons of heating boiler diesel fuel and \$54,000 per year in cost savings during the award period.

In accordance with Executive Order 13693, NAVMAG Indian Island installed two electrical charging stations in March 2017 and acquired two plug-in hybrid sedans, both of which are Ford C-Max Energi, as part of the installation motor pool. These two hybrid vehicles reduce fuel consumption by approximately 250 to 300 gallons per year.



Photo 4: Electric Hybrid Sedan and Charging Station

Recycling and Waste Diversion

The recycling at NAVMAG Indian Island is part of the Navy Region Northwest Qualified Recycling Program and during the award period, the installation diverted 53% of the 288 tons of refuse and 326 tons of recycled material, from the overall volume of refuse generated. There are 12 large containers for metal and wood recycling and 80 smaller plastic bins for other materials such as aluminum, plastic, glass, cardboard and paper. Additionally, construction and repair projects during the award period generated approximately 1,800 tons of asphalt and concrete debris that was diverted from landfills and taken to recycle facilities where it was crushed and repurposed. The installation recycled 1,104 pounds of used batteries, 421 gallons of motor oil and 174 gallons of antifreeze generated from the vehicle maintenance shop during the award period. Based on the USEPA Waste Reduction Model (WARM) tool calculations for the award period, the total greenhouse gas reductions resulting from the installation's waste diversion total is equivalent to removing 212 passenger cars from the highway.



Photo 5: Metal and Cardboard/Plastic/Paper Recycle Containers

Green Product Procurement

NAVMAG Indian Island uses Breakthrough solvent in five parts washers throughout the installation for cleaning vehicle and weapons parts and components. This is a citrus-based solvent that contains no toxic or harmful constituents (e.g. xylene, toluene, etc.) and when changed out it is Non-Regulated Waste as opposed to Hazardous or Dangerous Waste, which is much safer to handle and has significantly lower disposal cost.



Photo 6: Breakthrough Parts Washer at Building 90 – Port Operations

Storm Water

The diversion of storm water at Building 84, the Vehicle Maintenance Shop, from the sanitary sewer system in July 2017 has resulted in the diversion of approximately 160,000 gallons of influent annually, which reduced the overall volume of water processed and treated at the waste water plant.

Potable Water

In May 2017 NAVMAG Indian Island implemented a project that replaced 128 faucet fixtures, 98 toilets and 33 shower heads on base with low flow models that reduced water consumption by approximately 440,000 gallons per year. The newly installed toilets include state of the art valves that feature low volume flush for liquid flush and high volume flush for solid waste. This reduction in flow benefits the wastewater plant by reducing the amount of sanitary sewer water influent sent to the plant for treatment and discharge.

NAVMAG Indian Island also replaced 32 antiquated scissor and toggle-style fire hydrants throughout the installation with new compression style hydrants. Many of the older hydrants had experienced metal fatigue and leaked which cumulatively resulted in substantial volumes of wasted water. The newly installed hydrant models no longer have this issue.

Drinking Water

In August 2018, NAVMAG Indian Island procured and installed four ELKAY EZH 20 bottle filling stations in the most populated buildings on base. This has provided installation employees a source of clean and filtered water, which has substantially reduced the use of disposable plastic water bottles. To date, these units have diverted the usage of approximately 6,836 plastic bottles (16.9 oz. size) from being disposed of as solid waste according to the digital counters displayed by each unit.



Photo 7: ELKAY EZH 20 Bottle Filling Station in Building 69

Waste Water

The installation's waste water treatment plant utilizes an ultraviolet (UV) disinfection system for treating effluent prior to discharge. This system was installed in 2013 replacing an antiquated chlorine gas and capsule infusion system that required residual monitoring and expensive purchases of chlorine gas cylinders and capsules. In recent years, the existing sand filter beds suffered compatibility issues with the new UV system resulting in reduced processing efficiency

and discharge rates. Consequently, the installation initiated a proposal to hire a consultant to identify processes and equipment to address this issue and increase efficiency.



Photos 8 & 9: Ultraviolet Disinfection System at Waste Water Treatment Plant

An engineering study on the waste water treatment plant was completed in 2017. As a result of this study, modifications were made to the plant that improved waste water processing efficiency by approximately 55 percent. The average volume of waste water treated following the modifications increased from 420 gallons per hour to 910 gallons per hour, which reduces operating costs and increases the overall capacity of the system to receive influent from visiting ships and submarines.

Public Outreach

The installation hosts an annual Earth Day event that typically consists of beach and roadside cleanup by employees and their guests. This field event is followed by presentations to participants about the importance of recycling, using green products, practicing energy conservation, and how their efforts can make a difference in protecting and conserving the environment at home and at work.

Each year, the installation conducts approximately 10 to 12 public bus tours of the base with a focus on the environmental program. Public groups that have taken the tour during the award period include the Port Ludlow Hiking Club, Marrowstone Island Community Association, Port Townsend Rotary Club and the Jefferson County Land Trust. During the tour, the Navy's sustainable practices such as recycling, energy efficiency projects, pollution prevention are highlighted. These events serve to build and strengthen relations with the local community by emphasizing NAVMAG Indian Island's commitment to protecting the environment.

Sustainable Achievement

NAVMAG Indian Island was awarded the SECNAV Platinum Level of Achievement in 2016 and Gold Level of Achievement in 2017 for its energy and water management program.