



**Fiscal Year 2015
Environmental Award
Submission
Naval Station Great Lakes**

**Environmental Quality –
Non-Industrial Installation**



Attest: Based on the review of the nomination criteria and regulatory database summary, Naval Station Great Lakes is award eligible.

◆Introduction◆

For 104 years, Naval Station Great Lakes (NAVSTA GLAKES) has enabled the annual transformation of America’s sons and daughters, brothers and sisters, fathers and mothers into today’s 21st Century Enlisted Sailors – the heart and soul of the muscle and bones of our Fleet. Being *The Quarterdeck of the Navy* since 1996, when NAVSTA GLAKES became the Navy’s only recruit basic training *boot camp* facility, the installation’s Sailors and civilian employees have executed our ashore base operating support mission in a prudent and responsible way, worthy of the confidence of our military leaders and citizens.



The three spears of Navy Installations Command’s (CNIC) trident is forged at NAVSTA GLAKES; hardened and vigilant security, safety and emergency response in protecting ★Fleet★

assets across 1,920 acres; hammered and crafted facilities management, environmental minded and innovative energy reduction strategies of 416 buildings enabling state of the art training facilities to the ★Fighters★; and polished morale, welfare and recreation, and support services, ranging from certified counseling and child care, to quality housing, nutritious meals, active fitness, sport and entertainment to service members and ★Families★.

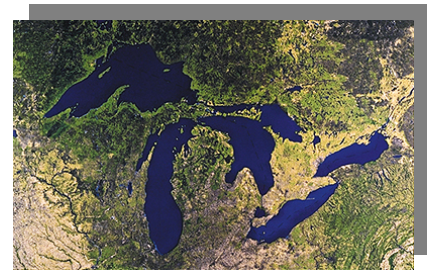
Installation Specs:

- Geography..... Great Lakes, (Lake County) IL, USA, within the corporate city limits of the city of North Chicago, along shore of Lake Michigan, between two large metropolitan cities (Chicago, IL 30 miles South & Milwaukee, WI 45 miles North)
- Acres..... 1,920
- Buildings..... 416, constructed between 1911 – 2015 (45 historically significant buildings)
- Population..... ~20,000 daily work force. ~38,000 recruits per year.
- Tenants..... 55+ tenant commands (Navy, Marine Corps, Army & Joint DoD)
- Top 5 tenants..... Recruit Training Command (Military = 8,300/Civilian = 46)
 Training Support Center (Military = 4,200/Civilian = 122)
 U.S. Military Entrance Processing Center (Military = 49/Civilian = 329)
 Captain James A. Lovell Federal Health Care Center (Military = 527/Civilian = 2,100)
 Marine Air Control Group 48 (Military = 560/Civilian = 3)

The natural environment encompassing Great Lakes and its surrounding communities includes lakefront beaches, rare dune ecosystems, coastal wetlands, and inland ravine hardwood forests. The surrounding community includes picturesque golf courses and residential subdivisions in rural settings, light industrial, chemical and pharmaceutical industries, and urban residential communities. A socially moderate political climate is predominant in Lake County, with strong support for environmental stewardship and sustainability.

Lake County is one of the fastest growing counties in the United States, with over 40% growth over the past 20 years, and is expected to grow another 35% by 2050. The county has adopted a strategic goal of promoting a sustainable environment as outlined in *Strategy for a Sustainable Lake County*, incorporating energy efficiency and conservation, water supply planning and conservation, solid waste recycling, pollutant reduction, and protecting/restoring ecosystems and open space.

NAVSTA GLAKES resides within the Chicago Area Moderate Non-Attainment Area for Ozone and is within highly regulated watersheds that flow to Lake Michigan. Lake Michigan and the Great Lakes contain 20% of the world's freshwater resources and supply drinking water to over 33 million people in the U.S. and Canada. The installation has a nationally registered historic district and 45 historically significant contributing buildings.



◆Background◆

NAVSTA GLAKES' vast size, population, infrastructure, support services and industrial scale laundry facility combine to create complex environmental and sustainability challenges.

- Primary environmental aspects include air emissions and natural resource consumption in heating and cooling the over 9.6 million square feet of administrative and training buildings throughout a four season climate cycle.
- Advanced trainers such as the gas turbine trainers and fire fighting trainers provide further air emission challenges regulated under a Title V Clean Air Act Permit.
- Large medical and dental clinics, drug testing laboratories, and treatment facilities also result in unique environmental challenges to manage hazardous wastes and wastewater discharges.
- An aggressive construction program and proximity within the Lake Michigan watershed area and an impaired waterway in Pettibone Creek result in challenging storm water management and permitting for construction and industrial sites. Large fuel storage near shorelines and Navy operations and recreational waterborne activity result in the installation being classified as a Substantial Harm Facility per the Oil Pollution Act of 1990, requiring an aggressive spill prevention and spill response capability.
- The Historic District and contributing facilities offer challenges in balancing cultural preservation with energy efficiency and modern mission requirements.



Programmatic management is accomplished through committed leadership and strong culture of teamwork across the entire installation and its tenants, which has driven operational planning through the Environmental Management System - Cross Functional Team, the Solid Waste Committee and the Pollution Prevention (P2) Committee and Base Energy Advisory Board. These efforts are facilitated by the Great Lakes Team comprised of the following: James Hawkins, CAPT (CO), Carl Kirar, CDR (PWO), Bruce Mack (Installation Environmental Program Manager), Matthew Wollert (Operations/Spill Response/EMS Manager), Jason Christianson, LTCDR (FEAD), Julie Mann (TSC EV POC), Harvey Pokorney (P816 Energy Project EV Manager), Jill Zavaski (BSVE Fuel/Fleet Manager), Peter Behrens (Energy Manager), Terese VanDosenel (Compliance Manager), Robert VanBendegom (Natural Resources Manager), Cora Mata (Clean Water Act Manager), Don Sytkowski (Clean Air Act Manager) and William Busko (Tank Program Manager).

NAVSTA GLAKES has driven successes across the full spectrum of environmental sustainability.

- Leads the Navy in sustainable vehicle fleet and alternative fuels use, sustainable laundry services, sustainable construction, and energy conservation.
- Smallest environmental staff and leanest budget of any large CONUS installation, leveraged support from higher echelons, forged partnerships with external agencies, industry, academia, and environmental groups and has engaged the local community to sustain effective environmental stewardship programs.

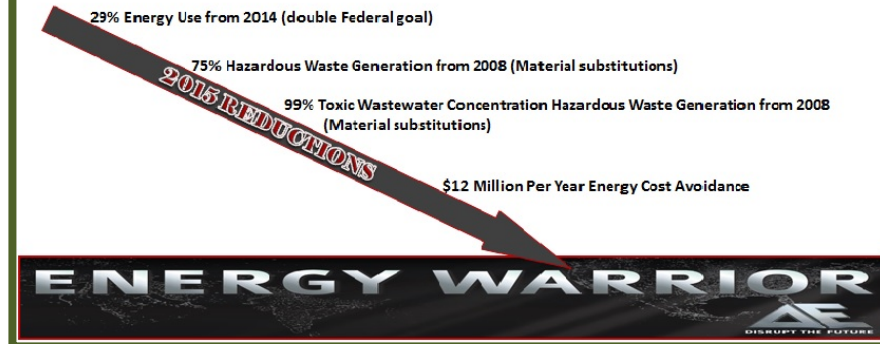
Environmental Management System (EMS)

- Centric approach focuses on significant aspects and alignment with the 2010-2011 DoD Strategic Sustainability Performance Plan.
- Environmental reports and updates are provided to installation leadership during weekly public works staff meetings and the commanding officer's monthly installation integration meeting with all tenant commanding officers.
- Active & Aggressive Cross Function Team (CFT) comprised of representatives from all tenant commands, in addition to NAVSTA GLAKES Public Works Departments (FEAD, Transportation Asset Management and Utilities) facilitate the environmental communications, support and education of goals and objectives throughout the entire installation. Aggressively pursued targets and objectives, resulting in:
 - Substantial pollution reductions
 - Energy and natural resource conservation
 - Pursuit of clean energy initiatives to meet Fleet and facility needs

Environmental Management System Cross Function Team

2015 Objectives

- ✓ Reduce energy use
- ✓ Reduce greenhouse gas emissions
- ✓ Reduce mercury in wastewater discharge
- ✓ Improve storm water pollution prevention during construction activities.



Green Procurement

NAVSTA GLAKES' active green procurement program requires local specification in all contracts to require preferable products, where economically feasible. Several of our service providers including (Orkin and Fluorecycle, Inc.) have earned the 2012 Governor of Illinois Sustainability Award. Additionally, all contractors maintain a spill response capability to respond to their specific type equipment and materials. All office paper and supplies include recycled content above federal goals. The environmental staff and EMS-CFT regularly train purchasers and credit card holders on green procurement expectations. To further illustrate the installation's commitment to environmental protection, their oil spill team annually participates in local and regional spill preparedness and events and was the first external Navy Region team to respond to the Deepwater Horizon oil spill in June 2010.

Partnerships – Strong, Effective and Engaging

NAVSTA GLAKES has remained actively involved with outside partners to share technology and to benefit from technology advances in industry and academia.

- Region 5 (six states) Sustainability Network with USEPA (USEPA Federal Green Challenge Team)
- Illinois EPA (pollution prevention)
- Illinois Sustainability Technology Center (University of Illinois)
- Illinois Department of Natural Resources, North Shore Water Reclamation District and Lake County Storm Water Management Commission
- Solid Waste Agency of Lake County (ex-officio member)
- Illinois Audubon Society, Lake County Openlands, and Lawrence Berkley National Laboratory (conservation)
- Lake County Emergency Planning Committee
- North Chicago Community High School

- Goodwill Industries
- Forest City Military Communities, LLC

◆Summary of Accomplishments & Achievements◆

NAVSTA GLAKES Environmental Quality Team incorporates environmental and mission sustainment into facility and operational planning; resulting in an excellent compliance record and trust-based relationships with state and federal regulators. Established objectives reduce impacts to the installation budget, protect the environment and sustain the mission.

Sustainable development, construction and energy are incorporated into the station master plan, regional shore infrastructure plan, and in the energy advisory board and EMS cross-functional team efforts. Accomplishments & Achievements produced include:

- 29% reduction in energy use over the last year, nearly double the federal goal.
- Increased thermal efficiency and combustion optimization technology from centralized boiler initiative P-816 projects significant reductions of regulated emissions and greenhouse gas emissions. Projected emission reductions:
 - Carbon Monoxide (CO) = 60%
 - Oxides of Nitrogen (NOx) = 80%
 - Volatile Organic Material (VOM) = 35% and
 - Carbon Dioxide (CO2) = 35%

*NOx and VOM are precursors to ozone formation, and as the Chicago area is classified as marginal non-attainment for ozone, this project will have a significant positive impact on the air quality in the region.

- Material substitutions have continued to reduce hazardous waste generation by 75% from 2008 levels, driving the installation to near small quantity generator status.
- Increased the recycling diversion rate from 11.9% in 2012 to 32.82% in 2015.
- Toxic wastewater concentrations have also been reduced by 99% through incorporation of industry-leading dental wastewater treatment systems and use of best management practices. Further evaluation including the long term sampling of several major sanitary sewer points and effluent evaluation have resulted in a new system design to be installed in FY 2016.
- These initiatives have reduced energy costs by over \$12 million per year, reduced environmental compliance costs, reduced impacts to the environment and correspondingly improved public perception and support for the Department of the Navy mission.
- Environmental and energy excellence awards from NAVFAC and has received Blue and Gold Department of Navy Energy and Water Management Level of Achievements from ASN (I&E).
- Governor of Illinois 2012 Environmental Sustainability Award
- Important Bird Area (IBA) status from the National Audubon Society and the Illinois Department of Natural Resources.
- USEPA Green Challenge Program for achieving Green Challenge FY 2012 Goals.

Green Fleet – Navy’s leader in implementing sustainable practices in operated vehicle fleets. Our visionary transportation leaders have planned and implemented a holistic approach to a sustainable fleet, with tremendous successes to date and further enhancements are planned. Over the past several years, NAVSTA GLAKES aggressively recapitalized its vehicle fleet with alternative-fueled vehicles, developed fueling stations for compressed natural gas, E-85 Ethanol,

and BD-20 Bio-Diesel, and implemented innovative fuel management systems to increase alternative fuel use.

A project to increase electric vehicles in future acquisitions and the installation of ten electrical charging stations at key locations across the installation was completed in 2014. Another key component to success is an automated chip key refueling system that is programmed to allow only the use of alternative fuel in vehicles that are flex fuel capable. This feature combined with new installed BMPs for vehicle operations and the addition of low-consumption and electric type vehicles has resulted in a 29.4% increase of BioDiesel, a 55.2% increase of Automotive Natural Gas and an increase of 20.1% of E85 fuels.

The transportation team has also been very effective in reducing vehicle usage and resulting air emissions and fuel consumption through implementation of shuttle bus service, vehicle usage surveys, vehicle pool consolidations, and ride-sharing programs. The installation entered a partnership with Goodwill Industries, Inc. to provide base-wide shuttle services for Sailors and contract workers. Rigid monitoring of vehicle use resulted in the reduction of 23% of vehicles base-wide and increased ride-sharing, which facilitated the elimination of over 117 older vehicles with poor emissions and fuel mileage as compared to Great Lakes' newer inventory. Use of automotive unleaded gasoline decreased by 8.6% and the overall miles driven was reduced by 193,883 miles from 2012 to 2015.

Public Outreach & Education – The installation has shared its successes and enhanced awareness of alternative fueled vehicles with our surrounding community and region-wide. This has been accomplished through off-site demonstrations, vehicle displays held in conjunction with Earth Day and Navy Day events at the North Chicago Community High School, Duker School, McHenry Middle School of McHenry, Illinois, and Lake County Forest Preserve District, North Chicago. An Electronics Collection and Education Event are conducted each spring. NAVSTA Great Lakes also plays host to the local Navy Jr. ROTC from Wheeling High Schools training ship the USS Manatra and assisted in their design of an environmental remotely operated submersible tested in Lake Michigan. The prototype is designed to sample environmental conditions beneath Lake Surface. Further partnering with the Illinois Audubon Society and the Illinois Department of Natural Resources specific to Migratory Bird Species inventories and habitat protection are paramount and major element of these programs.

Pollution Prevention/ Waste Reduction – As part of the Pollution Prevention and Solid Waste Management Committee activities, a new program was introduced during FY 2012 to divert the green landscaping waste from the solid waste stream. A separate dumpster was provided and all green type wastes are collected separately for offsite composting. It was projected that 10-15 tons/year of green waste will be diverted from the solid waste stream with this new program, when according to the tracking data, over 24 tons of green type wastes have been diverted.

As part of the P2 Committees efforts, an innovative food waste pulper-extractor system was introduced in 2011. The pulper-extractor system reduces waste of the Navy's largest galley operation by 70%. The remaining galley food waste is collected and utilized by a local compost facility resulting in the diversion of 400 tons/year from the solid waste stream which is a 17.5% increase since 2014.

The P2 Team also in cooperation with the PWD-Utilities and Moral Welfare and Recreation (MWR) has installed a new parts washer systems that is 100% solvent free and utilizes microbial technology (BioCircle). The BioCircle system has resulted in a reduction of over 710 pounds of solvent waste per year. As part of pollution prevention and public outreach, the P2 Team also initiated an annual electronic collection event in celebration of Earth Day. The collection area was located off-station to allow public access and resulted in the dissemination of environmental information along with the collection of 9,919 pounds of electronic equipment.

Green Construction – NAVSTA GLAKES is a leader in sustainable construction. Since FY 2000 when a bachelor enlisted quarters project earned a pioneer certification under the U.S. Green Building Council LEED v.1 the installation has incorporated green building design elements in 17 construction projects.

With construction completed in FY 10/11, the “P-744 Special Programs Barracks,” has similar sustainable design aspects that meet ASHRAE 90.1-2004 and ASHRAE 55 standards. Unique window treatments adjust automatically for optimal thermal comfort while supporting natural daylighting and views. Energy conservation measures include use of occupancy sensors, low lighting load, DDC controls, four pipe heating/cooling, and zoned air handling systems. The site was designed to maintain 60% open space and reduce stormwater runoff by 35% as compared to pre-developmental conditions, and 81% of pollutant loads are removed from storm runoff. Use of native buffalo grass for landscaping reduces irrigation water use and grounds maintenance. This building is expected to meet LEED v.2.2 Silver, as a minimum.

Energy Conservation – NAVSTA GLAKES achieved a 35% reduction in energy consumption and is 20% ahead of the established reduction goal established in EO 13423. The energy management team has a sustained history of identifying innovative ways to improve energy performance.

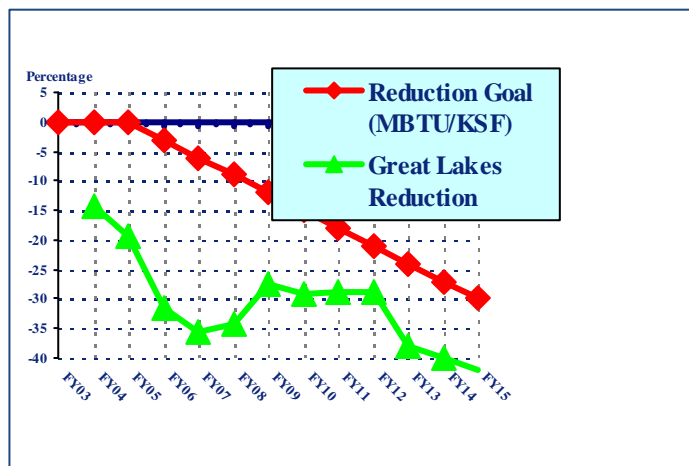
Formalized an improved energy program with a base-wide instruction and establishment of an Energy Management Team, an Installation energy advisory board, a full-time energy manager and a contracted resource efficiency manager (REM), and designating building energy managers for all facilities on the installation. This tiered energy management team has greatly increased energy awareness across the installation through clear command leadership commitment, frequent communication using several media, hosting energy fairs, and through face-to-face training. Energy outreach events included Earth day, July 4th Festival and Housing Community Forum.

In FY 2014, Phase I of the Energy Savings Performance Contract (ESPC) was completed for 54 buildings across the installation. The project significantly enhanced direct digital control systems and further improved lighting, performed HVAC system retro commissioning, installed variable frequency drive chiller systems, upgraded plumbing fixtures, and upgraded steam and boiler systems. This project affects 3.7 million SF (36% of the installation’s total building space), is estimated to reduce these buildings energy intensity by a further 13%, and will save \$2.1 million per year in energy costs (4% base-wide reduction). NAVSTA GLAKES is in the execution stages of a major utility upgrade project; P-816 NSGL Steam Plant Decentralization.

Installation Comparison	Energy Reduction (since FY 03 Baseline)
Naval Station Great Lakes	-42.0%
EO 13423 Goal	-29.0%

This \$84 million project will improve the efficiency of facility heat and hot water systems and is expected to result in \$9 million per year savings in energy costs and up to a potential 15% reduction in total energy intensity. Renewable energy sources are a major part of EISA 2007. This includes the installation of a 100 kW wind turbine for the Marine Air Control Group completed in 2014 and the planned installation of a 2.3 Mw Hybrid Solar PV and thermal system under the ESPC Phase 2 Contract (Feasibility study is underway).

NAVSTA GLAKES has been a leader in supporting EISA 2007 in collaborating with industry and academia in hosting Environmental Security Technology Certification Program (ESTCP) demonstration projects. A “continuous automated commissioning” project was completed in 2014/2015 in collaboration with United Technologies, and the Lawrence Berkley National Laboratory. This project developed a high-end energy model for three buildings and monitors actual building system performance with predicted expectations to highlight under-performing components that are then scheduled for maintenance. Other demonstration



projects hosted at Great Lakes include Energy performance and optimization, Rapid energy modeling and Natural Gas engine heat pumps. Great Lakes has also been selected by the Naval Facilities Engineering Service Center as a test site under their TECHVAL Program to implement “direct replacement LED lighting” and work station specific lighting demonstration projects. In addition, a study to develop geothermal heat pump systems for the entire PPV Housing Program is currently underway. If the project proceeds, approximately 2,000 geothermal wells would be installed to reduce energy usage for over 1,500 residential units resulting in the savings of 50,000 BTU’s.

◆Photo Album◆

