

INTRODUCTION

PRIMARY MISSION



The primary mission of the Portsmouth Naval Shipyard (PNSY) is to overhaul, repair, and modernize the U.S. Navy's nuclear-powered submarine fleet and to complete the work in a safe, timely, and affordable manner. PNSY is only one of four remaining naval

shipyards in the nation. PNSY has three dry docks capable of docking all active classes of submarines including the *Los Angeles*, *Trident* and *Virginia*.

SHIPYARD, MILITARY, & TENANT POPULATIONS

Approximately 5,250 civilian employees currently work at PNSY, along with 1,050 active duty military personnel (including estimated rotating sub crews). Although PNSY functions primarily as an industrial facility for the overhauling of submarines, it also provides support facilities for the U.S. Navy Survival, Evasion, Resistance, & Escape (SERE) School, the Naval Branch Health Clinic Portsmouth, the U.S. Army Recruiting Battalion, the Defense Logistics Agency, and the U.S. Coast Guard. PNSY also supports military personnel with on-base berthing, family-oriented programs, and recreational opportunities.

FACILITY LOCATION & DESCRIPTION

PNSY is located in the Town of Kittery, Maine at the southernmost tip of the state, approximately 50 miles north of Boston, Massachusetts. PNSY fully encompasses Seavey Island, which is situated at the mouth of the Piscataqua River. The Piscataqua River is a tidal estuary that forms a natural boundary between Maine (ME) and New Hampshire (NH). This federally-owned island is located across the harbor



ENVIRONMENTAL RESTORATION - INSTALLATION

PORTSMOUTH NAVAL SHIPYARD, MAINE

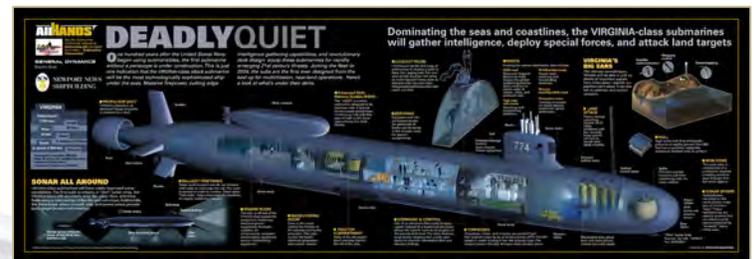
from Portsmouth, NH, with access to the mainland via two bridges connected to Kittery, ME. The main base of PNSY is approximately 288 acres in size, over 62 acres of which is managed as the Controlled Industrial Area (CIA). Industrial activities are concentrated at the western portion of the base within the tightly-controlled CIA, which includes all dry docks, vessel berths, and numerous buildings that house trade shops related to maintenance activities. Areas outside the CIA generally include additional trade shops, administration offices, officers' residences, vehicle parking, and recreational facilities.

HISTORY OF INSTALLATION

PNSY was officially established as a Federal facility in 1800. The facility's primary mission at that time (Civil War period) was to build and repair Navy



warships. In 1917, the first government-built submarine, the "L-8", was designed and constructed at PNSY during World War I. PNSY continued to build submarines until 1969 when the mission was realigned to function exclusively as a submarine overhaul facility. Today, PNSY services some of the most technologically advanced nuclear-powered submarines in the world.



ENVIRONMENTAL RESTORATION BACKGROUND

REGULATORY HISTORY

Prior to Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) regulations, years of shipbuilding and submarine repair work at PNSY resulted in hazardous substances being released into the soil, groundwater, surface water, and sediment on and around the installation. In 1983, an Initial Assessment Study (IAS) identified 28 potentially contaminated sites at PNSY requiring further investigation. Following this investigation, 15 of the 28 original sites were eliminated from the



study. The 13 remaining sites were grouped together based upon similar contaminants and/or locations into seven distinct Operable Units (OUs) and a single Site Screening Area (SSA) (see figure, bottom right). The Navy formally established the IR Program in 1986 to address the remaining sites identified during the IAS. PNSY was placed on the National Priorities List (NPL) in May 1994. In September 1999, a Federal Facility Agreement (FFA) was signed by the Navy and U.S. Environmental Protection Agency (EPA). The State of Maine Department of Environmental Protection (MEDEP) elected not to be a party to the FFA at that time, but rather to maintain a participatory role under CERCLA.

CURRENT NAVY PNSY IR STAFF

Navy personnel currently responsible for PNSY IR Program management include:

- ❖ The Remedial Project Manager (RPM) with Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic (MIDLANT) Integrated Project Team (IPT) is the lead for the Navy with regards to regulatory collaboration, technical review, environmental contractor management, funding and budgeting requirements, and overall administrative duties.
- ❖ The PNSY IR Program Coordinator with NAVFAC Public Works Department Maine (PWD-ME) Environmental (EV) Division provides installation support for the RPM and serves as the local technical representative for all IR related issues at PNSY. The PNSY IR Program Coordinator also enforces compliance for PNSY and contractors conducting work within or near the IR sites.
- ❖ The PWD-ME EV Division Director provides installation IR support and serves as the Navy Restoration Advisory Board (RAB) Co-chair.

Regional and local support is received from various departments across NAVFAC MIDLANT and PWD-ME, including Environmental, Construction, Engineering, Planning, and Acquisition. PNSY command support is provided by the Commanding Officer (CO) and the Public Affairs Office (PAO). FY09-FY10 was a transitional period for the IR Program as management shifted from PNSY Naval Sea Systems Command (NAVSEA) Code 106.3 Environmental to the newly established NAVFAC PWD-ME EV Division.

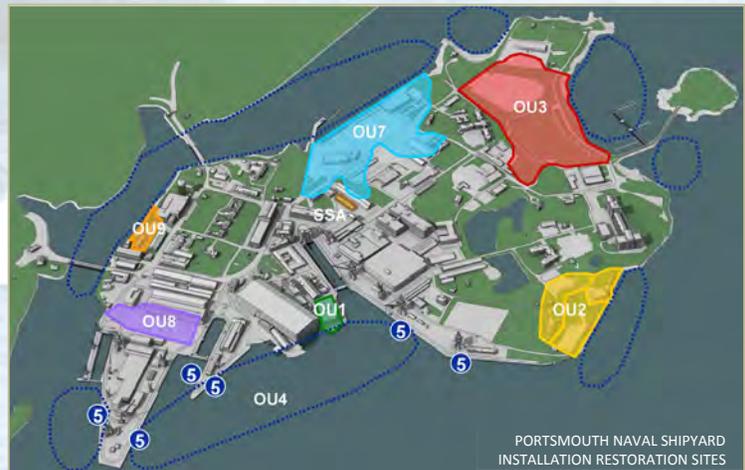
PNSY INSTALLATION RESTORATION (IR) PROGRAM

The IR Program has been successful in maintaining and promoting environmental stewardship, while never losing focus on the overall mission of PNSY -

the support of Navy Warfighters. Specific program objectives include: 1) Cleanup and closure of remaining active sites; 2) Optimizing existing remediation systems and long-term monitoring plans; 3) Enhancing community relations and stakeholder partnerships; and 4) Providing more effective and efficient program management to ensure that all remediation obligations will be met in a timely manner. The IR Program is committed to successful remediation that will ensure the protection and preservation of human health and the environment. This is being accomplished in part through the direct partnership between the Navy and its regulatory stakeholders, along with collaboration with local municipalities and community residents through an engaged Restoration Advisory Board (RAB).

SITE MANAGEMENT PLAN (SMP)

The IR investigation and cleanup schedules are established and updated annually as part of the Site Management Plan (SMP). The SMP serves as a management tool for planning, reviewing, and setting priorities for investigative and remedial IR activities at PNSY. The summary table below shows the aggressive schedule the Navy is committed to in expediting final remedy/closure at each IR site.



Operable Unit	Site Designation	Site Discovery	Preliminary Investigation	Remedial Investigation	Feasibility Study	Record of Decision	Remedial Design	Remedial Action	Removal Action	OH&M Start or Site Closeout
OU1	Site 10: Former Battery Acid Tank No. 24	*	*	*	*	*	FY12	FY12	FY12	
OU2	Site 6: DRMO Storage Yard & DRMO Impact Area Site 29: Former Teepee Incinerator Site Site 8: Jamaica Island Land Fill	*	*	*	*	*	FY12	FY12	FY13	
OU3	Site 9: Former Mercury Burial Sites Site 11: Former Waste Oil Tanks No. 6 & 7	*	*	*	*	*	*	*	*	*
OU4	Site 5: Former Industrial Waste Outfalls	*	*	*	FY12	FY12	FY13	FY14	FY14	
OU7	Site 32: Topeka Pier Site	*	*		FY12	FY12	FY13	FY14	FY14	
OU8	Site 31: West Timber Basin	*	*		FY12	FY13	FY14	FY14	FY14	
OU9	Site 34: Former Oil Gasification Plant	*	*		FY12	FY12	FY13	FY13	FY13	
Site Screening Area	Site 30: Galvanizing Plant, Building 184	*	*	N/A	N/A	N/A	N/A	FY12	FY12	

Installation Restoration Investigation / Cleanup schedule
 * = Complete; FY_ = Anticipated Completion Date



In brief, the schedule lists all final remedies to be in place by FY14, a plan intended to streamline the cleanup process at PNSY.

RESTORATION ADVISORY BOARD (RAB) & ADDITIONAL COMMUNITY INVOLVEMENT

The Navy, EPA, MEDEP, and representatives of the local communities of Kittery, ME and Portsmouth, NH meet quarterly at the Kittery Town Hall as part of the Restoration Advisory Board (RAB).



New Hampshire Department of Environmental Services (NHDES) representatives also participate in the RAB. The public is represented in the IR process by a local citizen's group, the Seacoast Anti-Pollution League (SAPL), and its technical representative supported by EPA's Technical Assistance Grant (TAG). Evolving from the Technical Review Committee (TRC) formed in 1987, the RAB was created in 1995 and has maintained a formal charter to provide an open forum between the Navy, regulatory agencies, and local community members to discuss PNSY IR cleanup activities. The participation of community members has proven vital to the success of the IR Program, especially given the common bond of the Piscataqua River. PNSY is situated at the center of the river, located directly between both municipalities. The extraordinary diversity of river usage from recreational sailing and boating to commercial fishing and lobstering creates a unique environment for local stakeholder interest.

Many residential homes, historic and recreational parks, marinas, commercial businesses, and industrial facilities are situated along both sides of the Piscataqua. The Navy along with its regulatory team



continues to welcome the opportunity to share proposed investigative and cleanup activities, analytical data results, program schedules, and cleanup goals with the local community members who have direct personal interest in, and respect for, the health of the Piscataqua. The Navy is fortunate to have such an engaged group of members, who bring diverse backgrounds and expertise to the RAB. PNSY has continually received positive feedback from the community members during RAB events. Community outreach was evident in June 2010 and August 2011 when PNSY hosted public meetings for the Proposed Remedial Action Plans (PRAPs) associated with OU1: Site 10 - Former Battery Acid Tank Site and OU2: - Former DRMO Storage Yard & Teepee Incinerator Site. The meetings were held at Kittery Town Hall and began with a public informational session, immediately followed by a public comment period. The events proved to be successful with thoughtful public comments received. Additionally, PNSY is currently in the process of finalizing its Community Involvement Plan (CIP). The process included interviews in Spring 2011 with federal, state, municipal, and local community stakeholders who were asked to provide honest opinions, concerns, and impressions of the PNSY IR Program. The intent of this effort is to assess the quantity and quality of community outreach to gain insight and understanding of potential public concerns. Ultimately, PNSY's goal is to enhance partnerships and express environmental stewardship to all stakeholders and interested parties.



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ENVIRONMENTAL RESTORATION CHALLENGES

CHALLENGES SPECIFIC TO PNSY

Outlined below are only some of the challenges faced while implementing the IR Program at PNSY. Importantly, coordination and communication are critical to ensuring success at this unique installation:

→ **Past Processes:** PNSY is a 210 year-old facility. The Shipyard has a long industrial history which has involved the manufacturing, processing, handling and disposal of various hazardous and non-hazardous materials used in shipbuilding. Many of these materials had been managed in accordance with procedures accepted at that time; but unfortunately,

resulted in the contamination of soils, groundwater, and sediments at the base.

→ **Full of Activity, Limited on Space:**

PNSY encompasses 288 acres, two-thirds of which is covered by high density industrial area, including over 376 buildings. Over 6,000 civilian and military personnel work at the Shipyard on a daily basis. Space is extremely limited at PNSY, making any additional activity outside the daily functionality of PNSY difficult to execute. This includes IR field investigation and cleanup activities.

→ **Original Island Assemblage:**

The Shipyard was built on a combination of Dennet, Seavey, Jamaica, and Clark Islands, which were historically connected by over 90 acres of fill material. The heterogeneous composition of the fill makes investigation, delineation, and cleanup of IR sites exceedingly challenging.

→ **Historic/Archeological Significance:**

The PNSY National Register Eligible Historic District (NREHD) encompasses over 200 of the 288 acres of the installation, with special consideration afforded to certain buildings, structures, monuments and areas of archaeological sensitivity. This also proves challenging, as facility modifications and ground disturbance within certain areas often require formal consultation with the Maine State Historic Preservation Officer (MESHPO).

→ **Protection of Natural Resources:**

Local residents and other stakeholders have a special interest in PNSY due to the common bond of the Piscataqua River. Groundwater modeling and monitoring is a key component to the investigation and documentation of potential contaminant migration. Additionally, sediment sampling and analysis aids in the identification of offshore environmental conditions. From a natural resources perspective, special consideration must be given during all field activities to limit any potential adverse impacts to the river. Such preventive measures often include: installation of erosion and sediment control structures, consolidated soils management, and protection of native vegetation.

→ **Restricted Access & Security:**

Since PNSY holds and maintains a nuclear license in the servicing of Navy nuclear-powered submarines, access to the facility is strictly managed and monitored. Coordination with mission and security requirements presents a significant challenge due to considerations required for various aspects of

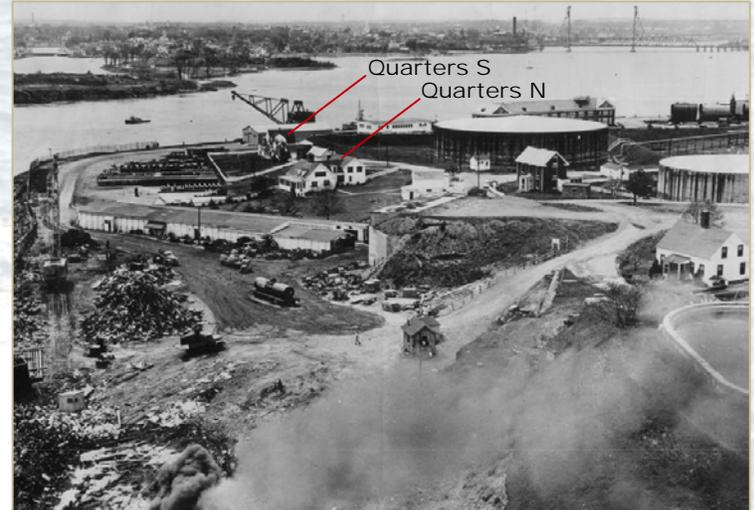
program execution, including the choice of field equipment and the implementation of innovated technology.

IR PROGRAM NOTABLE ACCOMPLISHMENTS

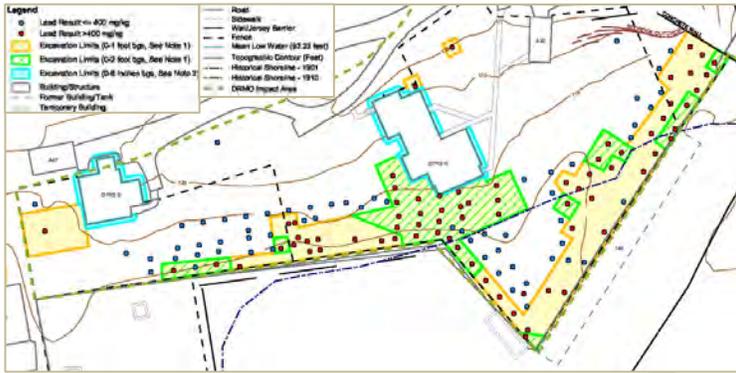
FY10 - FY11 HIGHLIGHTS

The following notable accomplishments are the direct result of exceptional teamwork between the Navy, EPA, MEDEP, and RAB community members:

✓ **OU2: Site 6 - Quarters S & N DRMO Impact Area**



The DRMO Impact Area Site is part of the OU2 DRMO Storage Yard Site, located north of the former DRMO Storage Yard at the southernmost portion of Seavey Island. The DRMO Impact Area consists of military housing units, Quarters S and N, and is located within the original shoreline of Seavey Island dating back to 1901. The area surrounding these Quarters consists of grassed yards, mature trees, walkways, and driveways. The southern limit of the site is defined by a privacy fence which separates the backyards from the former storage yard. Since its establishment in 1920, the DRMO Storage Yard historically stored materials that included lead and nickel-cadmium battery elements, motors, and scrap metal. The contaminants of concern are directly associated with the lead and nickel-cadmium battery cells and plates that were stored on uncovered pallets. Historically, storage yard operations primarily occurred south of the residential privacy fence but also likely occurred in adjacent areas. Access roads and railroad tracks used for the transportation of materials to the storage yard were present in what are now the backyards of Quarters S and N. Snow plowing in the storage yard also may have pushed stored materials into adjacent areas, including the backyards of Quarters S and N. In 2008, subsurface investigations discovered lead and copper in soil at concentrations



exceeding residential screening levels for human and ecological receptors. Based on these investigations, future use of the Quarters was suspended until remedial activities were conducted to reduce contaminants to acceptable residential cleanup levels. In November 2009, the CO signed an Action Memorandum (AM) for a Non-Time Critical Removal Action (NTCRA) at the DRMO Impact Area. Specifically, the NTCRA focused on the cleanup of the landscaped backyard areas located immediately south of Quarters S and N. Contractor mobilization and pre-excavation in-situ sampling began in May 2010. A Phase I Archeological Survey, proposed as part of the consultation process with the MESHPO, was initiated June 2010 as work was located within a previously identified area of potential archaeological significance. The Phase I resulted in the discovery of three archaeological items of interest within close proximity to Quarters N. Further evaluation of these items was conducted as part of a Phase II Archeological Survey, which subsequently classified the items as archaeologically insignificant. As a result, MESHPO concurrence was received such that the remedial excavation activities could begin in September 2010. Approximately 370 cubic yards of hazardous and 2,300 cubic yards of non-hazardous soils were excavated, removed, and disposed of as part of the effort which was completed in November 2010. Post-excavation sampling confirmed that conditions had been restored to meet the applicable residential cleanup standards. As a result, PNSY was successful in meeting its primary remedial objective of mitigating human health and environmental risks



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associated with contaminated soil to support unrestricted property use and unlimited exposure.



Final backfilling, landscaping and fence replacement were completed during Fall 2010 and Spring 2011. Regulatory agencies have agreed to a No

Further Action (NFA) decision for the site as was specified in the OU2 DRMO Storage Yard Record of Decision (ROD) signed in September 2011.

✓ **SSA: Site 30 – Bldg 184 Galvanizing Plant**

Building 184 was originally constructed in 1943 to serve as a galvanizing plant for PNSY during World War II. The tank vault was constructed at the approximate center, eastern wall of the building. The tank vault, measuring approximately 52 feet long by 35 feet wide by 4 feet deep, was constructed as a concrete vault lined with acid-proof bricks set in acid-proof cement. The tank vault originally contained multiple pickling tanks that were used to remove oxide scale from metal surfaces via immersion in a diluted acid bath. This past process chemically cleaned



the metal surfaces in preparation for plating and galvanizing. During peak production, between 1943 and 1945, up to 500,000 pounds of material were galvanized per month. Circa 1960, in order to accommodate a new PNSY welding school, the tanks were removed and the vault was backfilled and covered with a concrete slab. In 1973, crystalline growth was discovered along the edges of the concrete slab. During a 2001 investigation, the substance tested hazardous (dermal contact) as a result of its low pH. Numerous periodic removals of the crystalline growth occurred through 2007, when a rubber membrane was installed as a barrier designed to eliminate direct contact and inhibit further growth. Exterior pavement was also re-graded to redirect stormwater away from the building. An Engineering Evaluation Cost Analysis (EE/CA) for Site 30 was finalized in November 2010 and the AM was signed by the CO in December 2010. A Removal Action Work Plan (RAWP) was finalized during the Summer



of 2011, with removal activities beginning September 2011. Initial work involved the removal of the existing concrete slab via a jack hammer-equipped skid steer. The area beneath the slab was immediately inspected for crystalline growth, which was limited strictly to the perimeter of the vault. The fill contained within the vault consisted of tan sand and gravel which was not impacted by crystalline growth. Approximately 300 cubic yards of non-hazardous soil was removed from the vault. Approximately two inches of perched water (approximately 600 gallons), encountered at the center of the vault floor, was pumped from the vault. The total amount included the rinse waste water used to clean the acid-proof brick vault floor. The brick floor and sidewalls of the vault were reported in excellent condition with no evidence of staining. Building 184 is considered an historically significant building; and therefore, prior MESHPO consultation was required for the Removal Action in order to comply with Section 106 of the National Historic Preservation Act (NHPA). One requirement from the consultation involved contracting an historic architectural photographer to document the historic features of the empty vault using large format and digital photography meeting the National Register photo criteria. After conducting site visits in November 2011, EPA and MEDEP agreed that an NFA decision is appropriate for Site 30. The Navy completed backfilling and concrete floor work as part of the final site restoration during November 2011. The completion of this removal action has prepared the way for the design and implementation of a \$3-million FY12 Special Energy Project enabling long-



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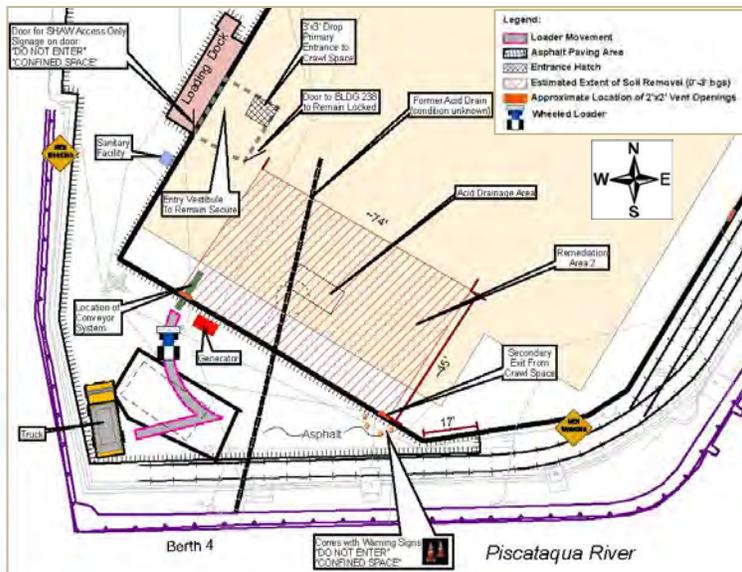
term adaptive reuse of the historic building. This remedial project is an exceptional example of IR Program support to the PNSY mission.

✓ **OU1: Site 10 – Bldg 238 Former Battery Acid Tank**

Building 238 is located on a small peninsula in the CIA where critical submarine maintenance activities are conducted on a daily basis. Building 238 was constructed in 1955 and was previously used for battery recharging operations. Lead is the primary contaminant of concern in both soil and groundwater at the OU1 Former Battery Acid Tank Site. The Piscataqua River forms the eastern, southern, and a portion of the western boundary of the OU1. The lead contamination originated from pre-1984 releases of rinse water discharged from lead-acid battery operations. Specifically, these releases occurred under the crawl space of the building/loading dock via former decrepit rinse water drainage piping. The earthen floor crawl space beneath Building 238 is five to six feet below the outside ground elevation and is completely inundated by groundwater at tidal levels greater than mean high tide. Existing lead concentrations in soil, which were reported at levels in exceedance of 10,000 parts per million (ppm), create an unacceptable human health risk for construction workers and PNSY personnel requiring access within the crawl space. Upon finalization of a Feasibility Study (FS) and PRAP in June 2010, a ROD was signed by the CO in September 2010. The RAWP was finalized in Fall 2011 and work is scheduled to start in late November 2011. The crawl space is considered a non-permit required confined space with increased safety precautions and expertise for entry. Given the site constraints, lead-contaminated soils will be hand shoveled onto a motorized conveyor system and stockpiled outside the building pending disposal. The total area of anticipated excavation is approximately 3,500 square feet to a total depth of three feet. This poses a significant challenge for intense physical labor in extreme, unfavorable working conditions. Excavation will continue until lead concentrations are reduced to levels which meet the cleanup standard for construction worker exposure. Since Building 238 is located within the PNSY CIA and is immediately



adjacent to Dry Dock 2 and Berths 4 and 5, the remedial efforts will be especially challenging. This is primarily due to the tight construction footprint, limited laydown space, narrow access/exit lanes, pedestrian and vehicle traffic, waterfront operations, potential snow removal operations, and increased security. In addition, the work will be located beneath a loading dock servicing multiple PNSY work centers occupying the building. The direct and frequent coordination with the CIA and Building 238 tenants, in close consideration of the mission, is critical to the success of the work which is expected to be completed by February 2012. Land Use Controls (LUCs) will be required for this site following the Removal Action. The Land Use Control Remedial Design (LUC RD) is currently being drafted and will be an integral part of the Site 10 remedy.

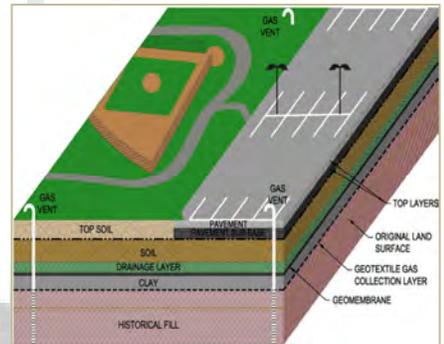


✓ **OU3: Sites 8, 9, & 11 – Jamaica Island Landfill**

From 1945 to 1978, PNSY used 25 acres of land, now identified as the Jamaica Island Landfill (JILF), for the disposal of refuse, trash, construction debris, dredged sediments, and industrial wastes. The area previously functioned as tidal mud flats. Following the signing of a ROD in 2002, approximately 43,000 cubic yards of landfill material was excavated and consolidated from the northern side of the site to the southern, where it was placed under a multi-layered landfill cover system. A two-acre salt marsh was constructed within the excavated area, which was reduced to one foot below the original tidal mudflat



elevation. Re-creation of this natural resource was successful in restoring viable wildlife habitat for various native marine invertebrates, fish, bird, and mammal species. The existing landfill is protected via an engineered multi-layered cap system as shown in the figure to the right. The northern portion of the landfill is currently paved and utilized as parking area. The southern portion functions as some of the very few athletic fields available at PNSY for use by military and civilian personnel. Importantly, the Navy finalized the OU3 LUC RD in August 2011. The ROD selected LUCs, including institutional and engineering controls, as components of the final remedy for OU3 to control and restrict certain types of property uses. The LUCs included in the selected OU3 remedy will be maintained until long-term monitoring has determined that concentrations of hazardous substances have been reduced to levels that allow for unlimited use and unrestricted exposure. The following OU3 LUC performance objectives were derived from the Remedial Action Objectives (RAOs):



- Maintain the landfill cover to prevent human exposure to contaminated soils and/or waste contained within the landfill.
- Prevent the use of groundwater as a potable water source at the installation.
- Maintain shoreline erosion control measures abutting the boundary of the landfill with the Piscataqua River and the Back Channel.
- Provide for continued uses of the landfill that are consistent with the remedy to include, but not be limited to, organized and unorganized sports, equipment storage, and parking.

The EPA has decided to use the PNSY OU3 LUC RD as the LUC RD template for all of EPA Region 1. The LUC RDs under development for OU1 and to be developed for OU2 will be modeled after the OU3 LUC RD. This is a significant accomplishment for the Navy and speaks to the great success of the PNSY IR Program.

The success of the PNSY IR Program exemplifies the Navy's commitment to the protection and preservation of human health and the environment.

— Matt Thyng, PNSY IR Program Coordinator
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