
NAS NORTH ISLAND - NAVY REGION SOUTHWEST

NAVY ENVIRONMENTAL LEADERSHIP PROGRAM

POLLUTION PREVENTION**SWEEPER/SCRUBBER FOR PIER CLEANING****LEAD ACTIVITY**

Naval Station San Diego, Ca.

STATUS

Complete

MISSION

Minimize and prevent pollutants on the piers from entering the bay reducing/minimizing the environmental impact of Naval Station, San Diego's operations on San Diego Bay.

REQUIREMENT

Piers at Naval Station are used primarily for ship berthing but other activities like physical training and ship maintenance are also accomplished. There are 14 piers located at the Naval Station. The piers are as long as 1000 feet and 120 feet wide. Operational and maintenance activities on the piers use both hazardous and non-hazardous materials and generate waste and debris. Birds that utilize area dumpsters and surrounding bays to scavenge food leave significant amounts of droppings on the piers. The Navy has instituted numerous Best Management Practices (BMP) to prevent and minimize pollutants coming from the piers to reach the bay. Using mechanical sweepers and scrubbers to clean Navy piers could reduce the amount of contaminants reaching surrounding waters.

DESCRIPTION

Using sweepers and scrubbers to mechanically clean piers can generally reduce the concentration of contaminants on the pier. The sweeper/scrubber pier cleaning process test involved employing two mechanical sweepers and one mechanical scrubber on four test areas on two different piers located at the Naval Station. After extensive vendor search because of the project requirements Tennant 830-II Power Sweepers and Tennant 550 Power Scrubbers were selected. The Power Sweeper is a mechanical street sweeper that includes the following major components-4-wheel power steering, 2 high-volume vacuum fans for dry dust control, exhaust filter, centrally suspended main broom, dual side brushes and variable height auxiliary brush, vacuum wand extension, stainless steel hopper, and the ability to dump the hopper up to 9 feet-6 inches above ground surface. The Tennant 550 Power Scrubber is a mechanical street scrubber that includes the following major components-articulated steering system, stainless steel debris hopper, 265-gallon solution recycling tank, 10-gallon detergent tank, Tennant 658 Heavy duty Recycling Cleaner as detergent.

The sweeper used multiple brushes and vacuum flows to collect dirt and trash from paved surfaces. The sweeper used during this evaluation had all of the available brushes installed before delivery. In addition, the sweepers included a 12-foot vacuum wand attachment that permits operators to clean areas that are inaccessible to the sweepers. Collected material is deposited into the hopper to be emptied directly into the dumpster, dump truck or other waste container. Exhaust filter from sweeping operations is effective on all particles larger than 3 microns.

The power scrubber applies a water and detergent cleaning solution with an under carriage spray system to surfaces the machine drives over. Brushes agitate the cleaning solution on the surface. Squeegees and a vacuum system then collect the cleaning solution for reuse. Used cleaning solution was disposed of through the bilge oily waste water treatment system (BOWTS).

Quantitative data were collected regarding the operation and the use of the sweepers and scrubbers through Daily and Monthly Operational Data sheets provided in the project Test Plan. Quantitative data regarding the effect of the sweepers and scrubber on contaminants present on the pier was collected through the implementation of the project sampling plan.

Qualitative data regarding the performance of the sweepers and scrubber were collected using the Monthly Operational Data Sheets. Operators provided comments regarding the overall performance of the equipment, its interface with site activities, and problems encountered during the month.

Operational data were collected using the Daily and Monthly Operational Data Sheets provided with the test plan. Data regarding the sweepers were collected between March 2000 and February 2001. Data regarding the scrubber were collected between July 2000 and May 2001.

Samples on the piers were collected in accordance with the project sampling plan. Four test areas on the piers were selected based on the likely degree of contamination and consistent access for sampling. Each test area was divided into a 10 foot by 10 foot test sections named for the method of cleaning employed in each area. Sample procedures and sample results can be found in the final draft of the project listed on the web site provided below. Three of the four test areas were located on pier 13 and the fourth test area was on pier 7. A total of 24 samples /not including equipment blanks were collected during the project. An equipment blank was collected for each test area sampled by running deionized water through the sampling equipment before the samples were collected. Each sample was analyzed using the following parameters: Total metals and mercury, semivolatiles compounds, conductivity, oil and grease, pH, total suspended solids, Total and fecal coliforms and toxicity.

The sweepers and scrubber significantly improved the apparent cleanliness of the areas in which they were used. These machines can form an important BMP for controlling pollution in storm water runoff: however, additional BMP's or other pollution prevention

control measures may prove necessary at some Navy facilities, including the piers at NAVSTA San Diego.

BENEFITS

- Improve the visible cleanliness of the piers.
- Reduce the concentration of pollutants on the piers.
- Reduce health risks from exposure to bird droppings.
- Reduce manpower required to maintain pier cleanliness.

ACCOMPLISHMENTS/CURRENT STATUS

Date	Activity
Mar 2000-Feb 2001	Collected data on the piers involving the use of Sweepers.
Jul 2000-May 2001	Collected data regarding the scrubber.

FUTURE PLAN OF ACTION & MILESTONES

Not Applicable

BIBLIOGRAPHY

- [Preproduction Initiative-NELP Sweeper/Scrubber for Pier Cleaning Final Report, Naval Station San Diego, CA](#)

RELATED GOVERNMENT INTERNET SITES

None Applicable

RELATED NAVY GUIDEBOOK REQUIREMENTS

None Applicable

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