

Modeling Tool for Navy Facilities to Quantify Sources, Loads, and Mitigation Actions of Metals in Storm water Discharges

Technology Description

Achieving industrial storm water permit limits as established by the National Pollutant Discharge Elimination System (NPDES) for metal contaminants—particularly copper and zinc—in surface water can be challenging due to low allowable part-per-billion toxicity levels. Major sources of metal contaminants for naval facilities generally include automobile brake pad and tire wear; general atmospheric deposition; building materials such as galvanized fences and roofing; and the equipment and processes used for common operations such as ship de-painting. These sources deposit copper and zinc onto impervious pavement where they can build up as residue. Effectively implementing best management practices (BMPs) is limited by the ability to quantify the relative magnitude of copper and zinc derived from these sources at DOD facilities.



The objective of this project is to demonstrate and validate the Source Loading and Management Model for Windows (WinSLAMM) storm water management model allowing Navy facility managers to identify potential sources of metals—particularly copper and zinc—in storm water runoff. The validated model also helps managers decide where to apply, and which control practices may be applied to provide effective BMPs.

Value to the Warfighter

The proposed solution will provide Navy-wide facility environmental managers with a validated tool to aid in their decisions to implement BMPs to mitigate metals in storm water discharges. A validated tool will provide the Navy with a scientific basis needed in developing effective storm water management plans and addressing appropriate implementation schedules to meet their compliance requirements. A validated tool will provide managers a solid basis for regulatory negotiations and thereby reduce costs associated with overly restrictive or rapid permit implementation. The tool will provide managers with a quantifiable basis for choosing and applying BMPs that will work best for specific drainages, thus providing benefit in streamlining costs to meet compliance requirements and by avoiding costs (monetary and reputation) associated with notices of violation, abatement orders, or lawsuits.

Economics of the Technology: ROI or Payback

The validated WinSlamm model was converted into a simplified spreadsheet tool that will make it available to Navy managers at no cost. The main payback expected is in the form of cost savings associated with making effective choices on where to apply BMPs. The model will aid decisions by providing the underlying data on relative sources and therefore the expected reductions before they are applied.

Technology Transition Documentation

This is a Technology Transition Category 4 in that it improves manager's capability for implementing BMPs by using the validated model to decide where to apply and which control practices may be applied. The final report and guidance document will be available December 2013. Contact Dr. Chuck Katz, chuck.katz@navy.mil, (619) 553-5332 for additional information.

Site Implementation

Once the WinSLAMM model is validated for use, it can be used to identify the relative sources magnitudes of copper and zinc in Navy drainages and where BMPs are best implemented to achieve the highest success rate in reducing potential the level of metal contaminants levels from Navy facilities.

Specific Applications

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This project was executed by Space and Naval Warfare Systems Command, Pacific under the Navy Environmental Sustainability Development to Integration (NESDI) Program.