

## Capping Stockpiles with Polymer Coatings

### Problem – uncovered stockpiles:

- Wind and water erosion
- Airborne dust
- Waterborne sediment
- Increased total suspended solids (TSS) in storm water run-off
- Wetlands and waterways contamination
- Containment of contaminated soils

### Traditional control methods:

- Cover with tarps
  - Time consuming installation process
  - Costly in terms of materials and labor
  - Requires stakes and sandbags on seams adding to time & cost
  - Less effective – difficult to secure
  - Damaged during strong winds and rainstorms
  - Labor intensive cleanup and disposal

### Solution:

- Acrylic polymer emulsion
  - Fast installation/application
  - Much lower cost
  - More effective, complete & seamless seal
  - Not damaged by weather
  - Effectively controls dust, sediment and TSS
  - Environmentally friendly solution
    - Meets National Pollution Discharge Elimination System requirements for erosion control
    - Meets the U. S. Environmental Protection Agency requirements for reducing particulate matter in the air
    - Classed non-hazardous by the Occupational Safety and Health Administration definition
  - No cleanup required

### Technology of application & benefits:

- Unique chemical characteristics
  - Linked and cross-linked molecular chains create 3 dimensional matrix in soil that can be as long as 1,000,000 molecules or more
- Penetrate, saturate, bond soil particles
  - Create a hard, dust-free, and water-resistant crust or skin
- Non-hazardous - Water-based - No VOCs
- Non-corrosive

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- Non-flammable
- New sticks to old
  - Reapply to increase strength or life of application
- Effective on all types of stockpiles
  - Sand, topsoil, gravel, minerals, landfills, contaminated soils

## **Examples:**

### **Stockpile Protected at Naval Shipyard in Long Beach, CA**

Water-based polymer emulsion coatings have been used on stockpiles of contaminated soil at Naval Shipyard, Long Beach, CA. One example was an application on approximately 11,000 cu yd of contaminated soil that needed covering to contain petroleum vapors and protect against erosion from wind and rain. Due to ultraviolet deterioration and constant winds, a plastic cover lasted about 2 months before a replacement was needed. A polymer coating was proposed as an alternative when the second plastic cover failed. The RWQCB approved the technology as an experiment for the site. The polymer coating was in place for more than one year and endured numerous rainstorms and high winds without having any dust or erosion problems.

### **Two Stockpiles Protected for Waste Management at Wheelabrator site in Boston, MA**

Two soil stockpiles made up of very fine sand and silt located at a site in the Boston, Massachusetts area controlled by Wheelabrator Technologies, Inc, a subsidiary of Waste Management needed capping to eliminate any dust or sediment from leaving the site.

A water-based acrylic polymer emulsion was chosen to provide protection. A spray on surface application has provided protection for many months and is still in place providing protection until the stockpile is used.

The application was 300 gallons per surface acre applied using conventional Hydroseed equipment and in a few hours complete coverage was achieved with minimal labor. One pile has recently been used and no clean up or uncovering of the pile was necessary. With conventional tarping of the pile to create protection, stakes and sandbags would have been required to keep the covering in place. The cost of a tarp covering would have been at least 50% more than the DirtGlue polymer alternative and the extensive labor involved to install and secure the tarp covering would have added to the cost. When the piles were to be added to, moved, or used there would have been the additional labor to uncover the piles and dispose of the tarps. When the tarps became damaged by wind, there would have been additional labor. The total time saved over conventional tarping was and is substantial. If stockpiles are added to or broken into for partial use, it is a simple matter to touch up the effected area with a re-spray of the polymer.

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## **Cost Analysis:**

Soil piles at NSY Long Beach were originally covered with a visqueen cover at a cost of approximately \$32k. The visqueen cover failed. It was replaced a second time and subsequently failed.

The cost to protect the pile at NSY, LB with polymer was approximately \$25k. The amount of polymer required for proper protection varies, thus the price range varies. The amount of polymer required depends on the surface area of soil, activity of soil (how often the soil is disturbed), and duration of soil control. So in order to determine the cost for coating a stockpile, the surface area, activity of the soil, duration of soil control, and the performance of the application must all be taken into account. Coating an inactive stockpile for a year will range from 3 to 6 cents per sq ft. Since the cost is a function of surface area, the stockpile should be constructed to minimize the surface area to lower the cost. Obviously, forming a taller pile with a circular or square base will minimize surface area.

There is no clean up cost associated with the use of water-based polymer emulsions.

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