Secretary of Defense
Environmental Award

Pollution Prevention
Non-Industrial Installation

Stormwater Management Plan
Defense Logistics Agency
Voorheesville Depot

At Voorheesville Depot, on-site stormwater management to control off-site migration of sediment into surface waters to avoid surface water quality problems potentially affecting public health.

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Summary of Achievements

The Voorheesville Depot in Watervliet, New York, stores strategic metal ores and materials as part of the National Defense Stockpile Program. The Defense Logistics Agency (DLA) was faced with the need to improve on-site stormwater management and control the off-site migration of sediment into surface waters to avoid a surface water quality problem that could affect the public health.

DLA's program developed a cost effective and readily implementable response which demonstrated the merit and applicability of a straightforward civil engineering remedy without the need for large capital resources to construct and operate a remedial system. The lessons learned are transferable across the board to any facility where materials are stored outdoors and stormwater quantity is an environmental control issue.

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Introduction

The approximately 35 acre Voorheesville Depot in Watervliet, New York stores strategic metal ores and materials as part of the National Stockpile Program. The Defense Logistics Agency (DLA) currently uses the Depot to store strategic metals in outdoor stockpiles or in drums. Materials include aluminum oxide, columbium/tantalum, copper, ferrochrome, lead, and zinc. A site plan is included as Figure 1.

DLA is currently conducting a remedial investigation to assess the potential release of the stockpiled materials to the environment. A release could pose a threat to the public health and the environment through the soil, surface water/sediment, and groundwater release contact pathways. Based on preliminary investigations, the water quality of stormwater samples from county road storm sewers discharging onto the depot property is of lower quality than on-site stormwater.

DLA was faced with the problem of developing a practical and cost-effective way to improve on-site stormwater management and control the off-site migration of sediment into surface waters.

DLA organized a team with the following members to evaluate the problem and design an effective remedy:

- F. Kevin Reilly, Director of Environmental Management and Quality Assurance, Defense National Stockpile Center, Defense Logistics Agency
- William Bendick, Army Corps of Engineers, New York District
- Stephen Hadjiyane, P.E., Gannett Fleming Engineers and Architects, P.C.
- Lars Augustin, E.I.T., Gannett Fleming Engineers and Architects, P.C.

Program Summary

Two off-site drainage areas discharge stormwater on-site. The stormwater accumulates in two retention basins located at the east and west corners of the Depot. Two drainage areas in the northern portion of the site have an approximate surface area of 171,500 ft^2 and 419,500 ft^2. Stormwater runoff from these drainage areas is routed through drainage ditches to stormwater retention pond located in the northwest corner of the site.

Two drainage areas located on the southern portion of the site have an approximate surface area of 589,000 ft^2 and 321,000 ft^2. Stormwater runoff from these drainage areas is routed through drainage ditches to a stormwater retention pond located in the southeast corner of the site.
A drainage area consisting of a small wooded area southeast of the property has an approximate

surface area of 50,000 ft^2. Stormwater runoff from this area discharges onto the site over the southernmost property boundary to one of the southern drainage areas.

A drainage area in a watershed on the south side of Depot Road has an approximate surface area of 2,050,000 ft^2. Stormwater runoff from the watershed is routed through drainage swales, catch basins, and piping which discharge through several outfalls at the southern boundary of the site and to the southern drainage area.

Retention volumes in the Northwest and South Ponds are approximately 27,000 ft^3 (202,000 gal) and 61,000 ft^3 (456,000 gal.) respectively. The Northwest Retention pond can accommodate a 0.56 in. storm event and the South Retention pond can accommodate a 0.45 in. storm event. Larger storms will cause stormwater to overflow to Black Creek.

Black Creek discharges into the Bozen Kill approximately 2 miles from the site. The Bozen Kill discharges to Watervliet Reservoir which is part of Normans Kill. Normans Kill, in turn, discharges to the Hudson River. Agencies suggested that the section of Black Creek near the Depot be reclassified as a Class A waterway (suitable for drinking water) because it discharges to the Watervliet Reservoir.

A simple and low cost stormwater management plan was developed to improve the way stormwater is managed on-site and to control sediment migration and the off-site discharge to surface water. Retention basins improve water quality by providing an area where sediment can settle out of the stormwater. Given sufficient area and time, the recharge basin will control the off site migration of sediment and minimize the water quality loads discharged off-site. The plan addressed stormwater run off contributions from on- and off-site sources and essentially consists of increasing the size and number of on-site retention basins to accommodate the largest probable storm events. The plan also implements a maintenance program to clean and improve the effectiveness of the drainage ditches and swales.

Figure 2 shows the proposed stormwater management system.

The project team requested local assistance from the Town of Guilderland Department of Public Works to help identify off-site stormwater sources from adjacent roadways and properties. Site and utility maps and drawings were compiled and reviewed to assist in identifying stormwater contribution areas and a field investigation was conducted through the joint efforts of the Town of Guilderland, Army Corps of Engineers (ACOE), DLA, and Gannett Fleming to confirm the stormwater sources. This interjurisdictional cooperation was an essential element in developing a pollution prevention plan that could be implemented with minimal cost and resource commitments.

A public participation program was implemented to supplement the plan development process. Public meetings with local community and environmental groups assured that the planning team was aware of and could maximize the use of the public's input and comment. The public provided very useful insights into how they are affected by the environmental issues at the depot and how these issues could be addressed through the pollution prevention program, especially in light of future site use. The public participation program also played an important role in assuring that the site improvements and remediation would be accepted at all relevant agency levels.

Figures 3, 4, 5, and 6 show the pond systems and emergency overflows.

The project team worked jointly with ACOE wetland sections to develop a nationwide permit for the remedial work and with the New York State Department of Environmental Protection to obtain a water quality certification for the stormwater discharge, which satisfied all construction and environmental regulations.

Accomplishments

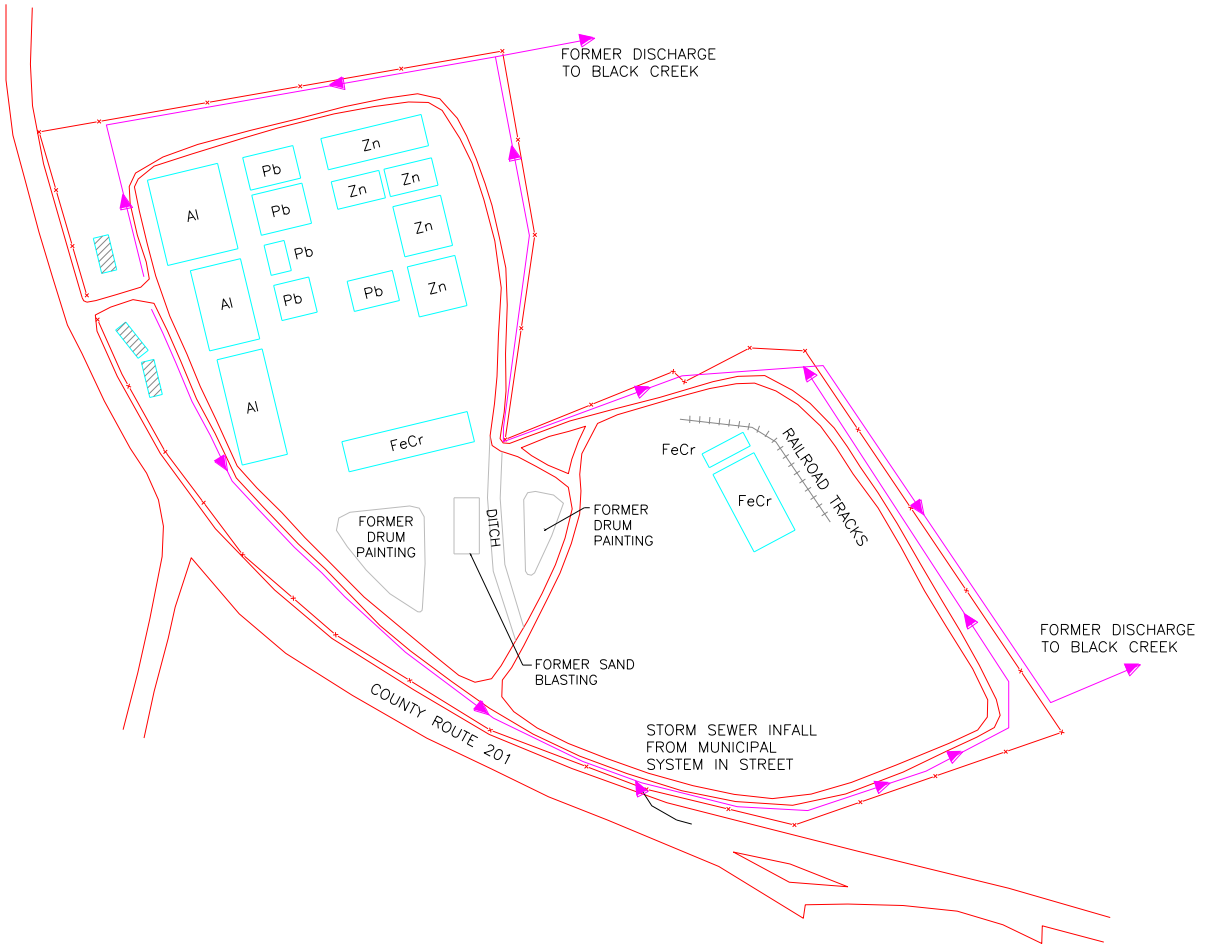
The team's integrated project management approach was instrumental in developing a cost-effective and practical remedial plan. All concerned parties, including the public, were involved in the plan development, and they supported the planning from inception through implementation.

The program was successful in developing a cost effective and readily implementable response to an emerging surface water contamination issue. The program also demonstrated the merit and applicability of a straightforward civil engineering remedy without the need for large capital resources to construct and operate a remedial system.

As the remedy is not based on "high technology," the lessons learned are transferable across the board to any facility where materials are stored outdoors and stormwater quantity is an emerging environmental control issue.

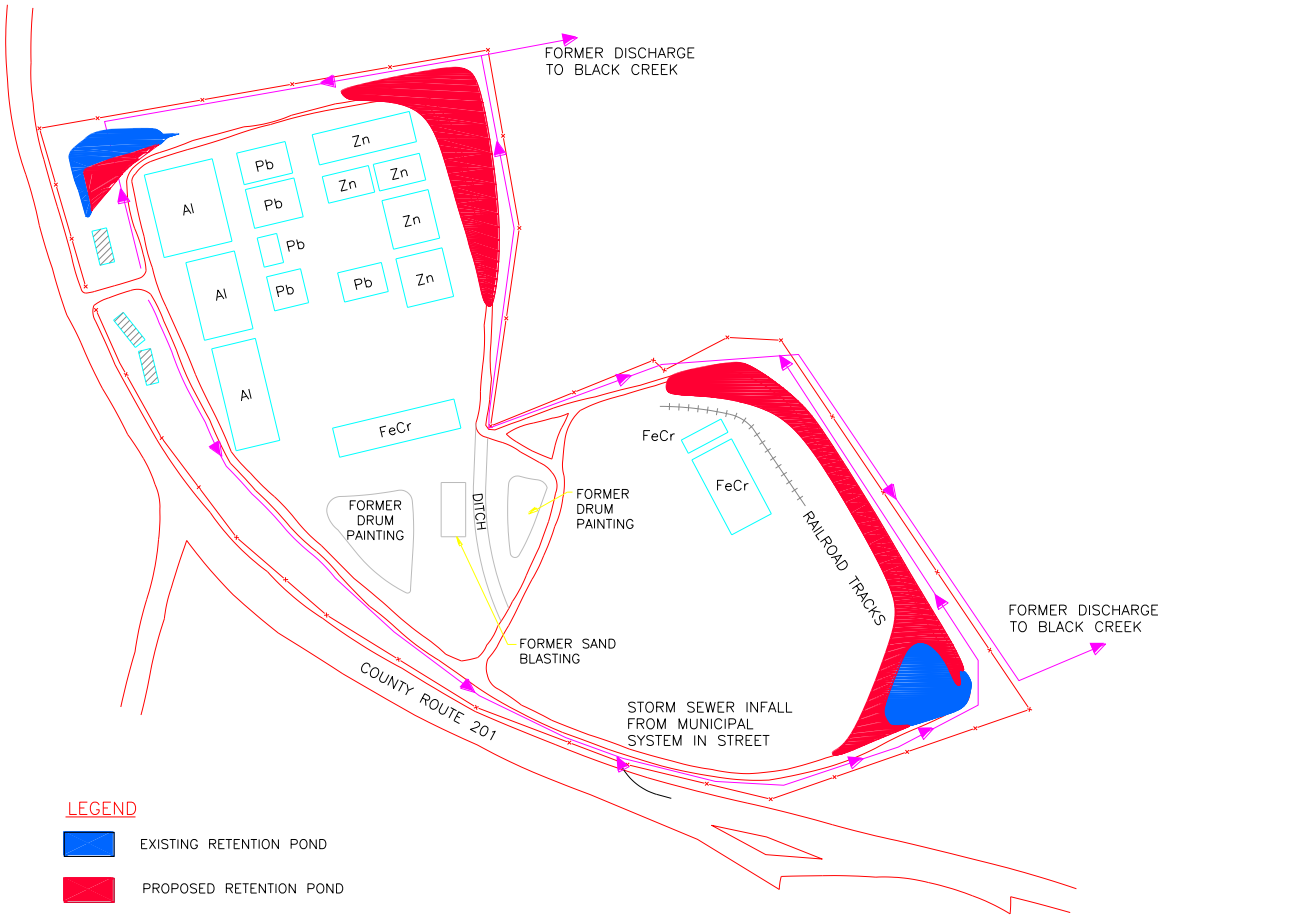
The "lessons learned" also demonstrate the merit of aggressive community involvement in defining the problem and in developing a workable remedy that the public will accept.

Figure 1 – Site Plan



SITE PLAN

Figure 2 – Proposed Stormwater Management Plan



PROPOSED STORMWATER
MANAGEMENT PLAN

Figure 3 - Northwest Retention Pond

Figure 4 - South Retention Pond

Figure 5 – Retention Pond Overflow

Figure 6 – Northwest View of Site Grading