SOIL/FILL MANAGEMENT PLAN
for
TECUMSEH REDEVELOPMENT SITE

LACKAWANNA, NEW YORK

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Prepared for:

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In Association With

TURNKEY ENVIRONMENTAL RESTORATION, LLC

SOIL/FILL MANAGEMENT PLAN
Tecumseh Redevelopment Site

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1.0 INTRODUCTION

1.1 Background and History

Tecumseh Redevelopment, Inc. (Tecumseh) owns a total of approximately 1,075 acres of land at 1951 Hamburg Turnpike, approximately 2 miles south of the City of Buffalo. Regional and Vicinity maps are presented as Figures 1 and 2. The majority of Tecumseh's property is located in the City of Lackawanna (the City), with approximately 140 acres of the property extending into the Town of Hamburg. The Tecumseh property is located on the west side of Route 5 (Hamburg Turnpike) on a portion of the site of the former Bethlehem Steel Corporation (BSC) Lackawanna Works in a historically industrial area. Tecumseh's property is bordered by: NY State Route 5 on the east; Lake Erie to the west and northwest; and other industrial properties to the south and the northeast.

The Tecumseh property was formerly used for the production of steel, coke and related products by Bethlehem Steel Corporation (BSC) until steel production was discontinued in 1983 and the coke ovens ceased activity in 2001. Tecumseh acquired the property, along with other BSC assets, out of bankruptcy in 2003.

Approximately 408 acres of the western portion of the Tecumseh property was reclaimed from Lake Erie by deposition of iron and steel making slag by Bethlehem Steel Corporation, and by the U.S. Army Corps. of Engineers from dredge spoils from the Buffalo River and harbor. This portion of the property is referred to as the Slag Fill Area (SFA). Approximately 29 acres of the SFA north of Smokes Creek has been leased by Tecumseh to BQ Energy for the development of a wind farm. Other portions of the SFA have been and continue to be licensed for reclamation of slag for beneficial reuse as commercial aggregate for structural fill, road base, and asphalt and concrete additives. Other portions of the Tecumseh property and associated buildings and facilities have been licensed for short-term use for surface storage and transportation of lumber, wood product and byproducts, and coal.

In April 2005, Tecumseh signed a Memorandum of Understanding (MOU) with Erie County and the City of Lackawanna to promote redevelopment of the former BSC Lackawanna property following cleanup and has prepared a conceptual Redevelopment Master Plan for the redevelopment of the entire 1,100-acre site.

1.2 Environmental Investigations and Remedial Efforts

Under terms of the 1990 United State Environmental Protection Agency (USEPA) Administrative Order on Consent, BSC agreed to perform a RCRA Facility Investigation (RFI) to identify the nature and extent of any release(s) of hazardous constituents from 104 Solid Waste Management Units (SWMUs). The potential impacts on water and sediment quality in six surface water bodies (watercourses) located on or adjacent to the former BSC-Lackawanna Facility were also to be addressed in the RFI. As the RFI Report was incomplete when Tecumseh acquired (most of) the former BSC-Lackawanna Facility in 2003, Tecumseh immediately initiated efforts to expeditiously complete the RFI. The Final RCRA Facilities Investigation Report submitted to USEPA in January 2005 recommended 38 SWMUs and three watercourses (i.e., Smokes Creek, Blasdell Creek, and the South Return Water Trench) for further evaluation with a Corrective Measures Study (CMS). In a May 17, 2006 letter to Tecumseh, the USEPA outlined an additional seven SWMUs/water courses; and a consolidated Coke Oven SWMU Group consisting of the previously identified 13 Coke Oven SWMUs and the area in between them within the Coke Oven area that will be carried forward in the CMS phase. All of the other SWMUs identified by USEPA in the 1990 Order were determined by UPEPA to require no further assessment as they do not pose a significant potential risk to human health or the environment. In September 2006, USEPA deemed the provisions of the 1990 Order to be satisfied and Tecumseh's obligations under the Order terminated. Tecumseh is currently negotiating an Order on Consent and CMS Work Plan with the New York State Department of Environmental Conservation (NYSDEC). This consent order will provide the framework for the phased cleanup of SWMUs and water bodies that were designated as requiring further action.

Selected parcels on the Tecumseh site that do not contain SWMUs requiring further action have been "carved out" of the CMS program. To date, five separate parcels; the Business Park Phase I, Phase IA, II and III and the Steel Winds Phase I parcels encompassing approximately 441 acres have been accepted into the New York State Brownfield Cleanup Program (BCP) (see Figure 2). These parcels will be investigated, remediated, and redeveloped under the BCP. Slag Fill Area (SFA) Zone 1 encompassing approximately 140 acres at the southwest corner of the Site is also planned to be "carved out" of the CMS Order. The area of the site subject to the CMS is approximately 517 acres.

1.3 Purpose and Scope

This SFMP was developed with the express purpose of addressing unknown subsurface impacts if and when encountered on the CMS Site outside the known or defined boundaries of the SWMUs determined to require further action, as presented in the RFI Report and amended by the USEPA in a May 17, 2006 letter to Tecumseh. The "Site" or "CMS Site" as defined herein is the portion of the Tecumseh Lackawanna property subject to the CMS Order as shown on Figure 2. Potentially contaminated soil/fill identified by field screening would be sampled and analyzed to verify concentrations of constituents of interest. Contaminated soil/fill found to exceed site-specific soil/fill cleanup objectives (SSCOs) would then be appropriately handled and/or disposed on-site or off-site.

This SFMP applies to all soil/slag/fill handling during Site redevelopment activities including, but not limited to:

- Clearing and site grading.
- Infrastructure construction (e.g., roads, waterline, sewers, electric cable).
- Foundation excavation.
- Slag reclamation/scrap recovery operations

Figure 3 provides a Site Plan that delineates the CMS areas designated for slag reclamation and scrap recovery operations under an existing license agreement, and illustrates the 100-foot buffer zones associated with each SWMU or SWMU group.

This SFMP provides protocols for the proper handling of site soil/slag/fill during Site development activities, including:

- Field screening and identifying potentially impacted soil/slag/fill.
- Sampling and analyzing potentially impacted site soil/slag/fill.
- Handling and disposing potentially impacted soil/slag/fill.
- Sampling, analyzing, and determining acceptability of soil/fill from off-site borrow sources for use as subgrade and surface soil/fill.
- Erosion and dust control measures.
- Access controls.
- Health and safety procedures for subsurface construction work and the protection of the surrounding community.

- Environmental easements.
- Notification and reporting requirements.

Similar, if not identical, SFMPs may be adopted for the BCP "carve out" portions of the Tecumseh property; however, these parcels are not subject to the CMS Order and are therefore not included in the scope of this SFMP. SFMPs for other areas of the Tecumseh property not covered by the CMS Order would require a project-specific proposal, and separate NYSDEC review and approval.

1.4 Soil/Fill Management Plan Responsibility

Tecumseh and future property owners will be responsible for all monitoring, implementation, and reporting requirements of this Plan on their property. Notification and reporting to regulatory agencies (i.e., NYSDEC Region 9, Division of Solid and Hazardous Materials and NYS Department of Health) prior to and following site development are described in Section 2.11. Property owners or their authorized agents shall notify the NYSDEC immediately after encountering any substance that is olfactory or visually impacted; obvious waste materials; or a material other than the slag/fill typically encountered across the CMS area. After final approval of the SFMP by the NYSDEC, responsibility for its implementation shall be incorporated into an environmental easement to be filed with the Erie County Clerk. As such, the responsibility for implementation of the SFMP shall run with the land.

Site developers, lessees, licensees and contractors to Tecumseh and future property owners will be provided copies of the SFMP by Tecumseh and will be required by written agreement not to perform, contract, or permit their employees, agents, or assigns to engage in any intrusive activities at the Site, except as delineated in this Plan.

Upon transfer of ownership of the Site or portions of the Site, the new owner(s) will be responsible for adapting and implementing this SFMP or revising this SFMP, and obtaining approval of the revised Plan from the NYSDEC. The NYSDEC may provide periodic construction oversight and monitoring during site redevelopment activities to verify adherence to the requirements of this SFMP.

2.0 SOIL/FILL MANAGEMENT

2.1 Excavation and Handling of On-Site Soil/Slag/Fill Material

During intrusive work on the Site (excluding incidental surficial landscaping maintenance), an Environmental Professional (refer to ASTM E1527-05 for definition) with experience in environmental site investigations, will inspect excavations or disturbances on behalf of the subject property owner, lessee, licensee, and/or developer. The excavated material will be inspected for staining or discoloration, and will be field screened for the presence of VOCs with a photoionization detector (PID). The PID detector will be calibrated as per the manufacturer's requirements.

2.2 Site Specific Soil/Fill Cleanup Objectives

NYCRR Part 375-6 (Remedial Program Soil Cleanup Objectives) establishes soil cleanup objectives (SCOs) for the identified use of a site in New York State. As the past, current and reasonably anticipated future use of the CMS Site is industrial, Table 375-6.8(b) defines SCOs for protection of public health for restricted industrial use sites such as this. With the exception of arsenic and certain polycyclic aromatic hydrocarbons (PAHs), these 375-6.8(b) SCOs shall be applicable to the CMS Site.

RFI and Brownfields Cleanup Program (BCP) investigations on the Steel Winds I Site and the Business Park Phases I and III portions of the Tecumseh property have demonstrated that concentrations of arsenic and certain PAHs (e.g., benzo(a)pyrene) routinely exceed the Part 375 restricted industrial use SCOs. Therefore complying with the Part 375 SCOs for these specific compounds is not deemed feasible for the Tecumseh CMS Site.

Part 375-6.9(c) allows for development of site-specific soil cleanup objectives (SSCOs). As such, Tecumseh plans to develop SSCOs for the CMS Site as part of the CMS.

2.3 Interim Soil/Fill Management Objectives

Until all soil/fill characterization data planned for collection during the CMS is available for review, Tecumseh proposes the establishment of interim soil/fill management objectives (ISMOs).

Excavated soil/slag/fill that is visibly stained, discolored, produces elevated PID readings (i.e., sustained readings of 5 ppm above background),or exhibits olfactory characteristics will be stockpiled in an area away from the primary work activities and sampled for reuse, treatment, or disposal. Sampling and analysis will be in accordance with the protocols delineated in Section 2.4. Analyzed soil/slag/fill determined to contain one or more constituents in excess of the Part 375 Restricted-Industrial Use Soil Cleanup Objectives (SCOs) or the interim soil/fill management objectives (ISMOs) listed below for arsenic and benzo(a)pyrene shall be treated and handled on-site, as described below in Section 2.3.1, or profiled and transported off-site to a permitted TSDF for disposal. Those materials that exceed the SCOs or ISMOs but are not listed waste or do not have hazardous characteristics, may be profiled and shipped off-site as non-hazardous industrial waste.

The following ISMOs are proposed for use on the CMS Site for arsenic and benzo(a)pyrene:

PROPOSED INTERIM SOIL/FILL MANAGEMENT OBJECTIVES (Based on Site Background Analysis)		
Constituent	**Part 375 Restricted Industrial Soil Cleanup Objective (SCO)** (mg/kg)	**Proposed Interim Soil/Fill Management Objective** (mg/kg)
Benzo(a)pyrene	1.1	**5.6**
Arsenic	16	**28.6**

These ISMOs were derived as alternative values to the Part 375 SCOs due to known site-specific conditions that routinely contribute to widespread exceedances of the Part 375 SCOs for these constituents in slag and historic fill that covers most of the former BSC site. These ISMOs shall be used until site-specific SSCOs are established in the CMS. An evaluation of available data for arsenic and certain PAH constituents shall be performed and included either as part of the CMS report, or prior to submission of the CMS report. The method of statistical data analysis shall be selected in conjunction with the Department based on and appropriate for the characteristics of the available data set, and is not to be pre-determined.

The ISMOs for arsenic (28.6 mg/kg) and benzo(a)pyrene (5.61 mg/kg) were derived from a statistical analysis of data obtained from adjacent parcels on the Tecumseh property during the Brownfelds Cleanup Program investigations. Attachment 1 includes the results of the statistical analysis and a tabular summary of the site data used.

For soil/fill with arsenic and/or benzo(a)pyrene concentrations that are found to exceed 16 mg/kg and 1.1 mg/kg, respectively, but are less than or equal to the ISMOs, Tecumseh will document and report to the Department the sample results, location where the material originated on the CMS site, the volume of soil, and the location(s) where the material was ultimately placed.

2.3.1 Impacted Soil/Slag/Fill

Materials exhibiting certain types of organic contamination will inevitably be encountered during intrusive activities on the CMS site. These areas, which will likely be isolated and limited in extent, may include materials containing tar and/or petroleum. If these materials are encountered, Tecumseh will notify NYSDEC to discuss the appropriateness of consolidating, treating, and/or disposing this material on-site. With NYSDEC approval, it is anticipated that the petroleum-impacted material may be consolidated for bio-remediation in the tank farm area (Zone 3). Tar-impacted soil/fill may be consolidated with the acid tar pit focused corrective measure proposed for Zone 2. However, it is anticipated that the acid tar pits corrective measures will be completed in 2010; therefore, any tar-impacted materials excavated following closure of the acid tar pits would require on-site disposal in the proposed Hazardous Waste Corrective Action Management Unit (CAMU) in SFA Zone 2 or off-site disposal in a commercially permitted Treatment, Storage, or Disposal Facility (TSDF). Alternatively, materials that exceed the SCOs or ISMOs but are not listed waste or do not have hazardous characteristics, could be shipped off-site as non-hazardous industrial waste.

2.3.2 Inert C&D Debris Fill

With NYSDEC approval, inert, un-impacted construction and demolition (C&D) debris (e.g., crushed concrete and brick) encountered during excavation or generated from the demolition of the former Coke Plant and associated facilities may be recycled or managed and consolidated for use as subgrade fill in sumps, pits, building basements, and

any other subsurface depression. If the C&D debris is to be used off-site anywhere within New York State, a Beneficial Use Determination (BUD) from the NYSDEC would be required. The need for a BUD will be determined on a case by case basis with the NYSDEC.

2.4 Subgrade Backfill Material

2.4.1 Use Criteria

Subgrade material used to backfill excavations or to increase site grades or elevations may be comprised of excavated on-site soil/slag/fill, inert C&D debris, or off-site soil/fill. The criteria under which these materials may be used as subgrade backfill are presented below.

- **Excavated, On-Site Soil/Slag/Fill or Inert C&D Debris:** Soil/slag/fill that is excavated from the Site during intrusive activities may be used on-site as subgrade backfill provided it does not exceed screening criteria and meets the requirement of Section 2.3 (ISMOs), if tested.

- **Off-Site Soil/Fill:** Off-site soil/fill may be used as subgrade backfill provided that it originates from known sources having no evidence of disposal or releases of hazardous substances; hazardous, toxic or radioactive wastes; or petroleum. NYSDEC would be involved in the decision as to whether the source is in fact known and acceptable for use. If the off-site soil/fill is of unknown origin or it originates from a commercial, industrial, or urban site then it must be tested and meet the criteria shown on Table 1. In addition, no off-site materials meeting the definition of a solid waste as defined in 6 NYCRR, Part 360-1.2 (a) shall be used as backfill.

- **Other Off-Site Material:** The following material may be imported, without chemical testing, to be used as backfill beneath pavement, building floors or the final soil cover (i.e., the uppermost 1 or 2 feet, depending on the site's use restriction), provided it contains less than 10% (by weight) material that would pass through a size 200 sieve: 1) Rock or stone, consisting of virgin material from a permitted mine or quarry; 2) Recycled concrete, brick, or asphalt from a NYSDEC-registered or permitted C&D debris processing facility (as specified in Section 360-16.1 of 6 NYCRR Part 360) that conforms to Section 304 of the New York State Department of Transportation Standard Specifications Construction and Materials Volume 1 (2002). As stated in Section 360-16.4(b)(2), the facility may only accept recognizable,

uncontaminated, nonpulverized C&D debris or C&D debris from other authorized C&D processing facilities. According to Section 360-16.2(c), uncontaminated means C&D debris that is not mixed or commingled with other solid waste at the point of generation, processing, or disposal, and that is not contaminated with spills of a petroleum product, hazardous waste, or industrial waste.

2.4.2 Borrow Source Sampling Requirements

If an off-site soil/fill borrow source is of unknown origin or originates from a commercial, industrial, or urban site, then it must meet the SCOs for the analytes listed in Table 1. A minimum of one composite sample will be collected for each 500 cubic yards (CY) up to 1,000 CY of a borrow source. If the first 1,000 CY meet the re-use criteria, the sample collection frequency may be reduced to one composite sample for each additional 1,000 CY of borrow source, up to 5,000 CY and one composite sample per 5,000 CY thereafter. A minimum of four grab samples will be collected for each composite sample. For VOC analysis, a single grab sample will be collected for each 250 CY up to 1,000 CY of a borrow source, with the grab biased toward the zone displaying the most elevated field PID reading. The samples will be analyzed in accordance with USEPA SW-846 Methodology by a NYSDOH ELAP-certified laboratory.

If an off-site soil/fill borrow source is of known origin, NYSDEC would be involved in the decision as to whether the source is in fact known and acceptable for use.

2.5 Soil/Slag/Fill Sampling and Analysis Protocol

Soil/slag/fill that exhibits visual and/or olfactory evidence of petroleum contamination or fill exhibiting elevated PID readings (i.e., >5 ppm) encountered during intrusive activities outside of SWMUs requiring further action under the CMS will be placed on plastic sheeting in an area away from primary work activities and then sampled to determine whether it is subject to special disposal/reuse requirements. No intrusive activity shall occur within the SWMUs requiring further action (see Figure 2).

Excavated soil/slag/fill should be stockpiled in 500 CY or smaller piles. A single grab sample will be collected from each stockpile, with the grab biased toward the zone displaying the most elevated field PID reading. If the stockpiles are from a single source area, sampling may be reduced to one sample per 1,000 CY following receipt of data from

the first two 500 CY stockpiles. The stockpiled material will be analyzed for VOCs; SVOCs (total and TCLP); RCRA metals (total and TCLP). If such analyses indicate that the concentrations of the constituents in these segregated materials are below ISMOs or SCOs (see Section 2.3), the materials can be re-used on-site. However, if such analysis indicates that the concentrations of the constituents in these segregated materials are above ISMOs or SCOs, the materials will be characterized for waste constituents per the requirements of a permitted off-site disposal facility and an appropriate disposal plan will be developed. Any materials exhibiting hazardous characteristics based on TCLP results will be disposed off-site as hazardous waste. Tar-impacted soil/fill may be consolidated with the acid tar pit focused corrective measure planned for Zone 2. However, it is anticipated that the acid tar pits corrective measure will be completed in 2010; therefore, any tar-impacted materials excavated following closure of the acid tar pits would require on-site disposal in the planned Hazardous Waste Corrective Action Management Unit (CAMU) in SFA Zone 2 or off-site disposal in a commercially permitted Treatment, Storage, or Disposal Facility (TSDF).

2.6 Final Surface Coverage

Vegetated soil or other surface coverage (e.g., asphalt, buildings, concrete) over redeveloped areas will likely be required by the owner as a pre-condition of occupancy (i.e., an occupancy restriction) and will be determined on a case-by-case basis for each area based on an assessment of the localized surficial soil/fill and the current and intended future use of the area. In areas exceeding the ISMOs or SCOs that are not covered by impervious materials (i.e., asphalt, concrete, or structures), 12 inches of vegetative soil cover will be required after slag reclamation activities are completed and final grades are achieved.

If required, topsoil used for the upper 6-inches of final soil cover shall meet the following general specifications:

1. Fertile, friable, natural loam surface soil, capable of sustaining plant growth, free of, clods of hard earth, plants or roots, sticks or other extraneous material harmful to plant growth. Supply a well-graded topsoil with the following approximate analysis:

(a)

Sieve Size	Percent Passing by Weight
3-inch	100
No. 4	>75
No. 200	>30

(b) pH 5.5 to pH 7.6.

(c) Minimum organic content of 2.5 percent as determined by ignition loss.

(d) Soluble salt content not greater than 500 ppm.

2. Before delivery, collect soil samples for every 5,000 cubic yards of topsoil provided by Developer.

Grass seed used for the final soil cover shall meet the following general specifications:

1. Grass seed mixture: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.

2. The entire ground surface disturbed by construction operations shall be seeded with 100 lbs/acre of seed conforming to the following:

Name of Grass	Application Rate (lbs/acre)	Purity (%)	Germination (%)
Perennial Ryegrass	10	95	85
Kentucky Bluegrass	20	85	75
Strong Creeping Red Fescue	20	95	80
Chewings Fescue	20	95	80
Hard Fescue	20	95	80
White Clover	10	98	75

(a) Germination and purity percentages should equal or exceed the minimum seed standards listed. If it is necessary to use seed with a germination percentage less than the minimum recommended above, increase the seeding rate accordingly to compensate for the lower germinations.

(b) Weed seed content not over 0.25 percent and free of noxious weeds.

(c) All seed shall be rejected if the label lists any of the following grasses:
1) Sheep Fescue
2) Meadow Fescue
3) Canada Blue
4) Alta Fescue
5) Kentucky 31 Fescue
6) Bent Grass

3. In addition to the seed mixtures listed above, one bushel per acre of oats or rye seed shall be sowed over the entire area, including drainage ditches, to provide a quick shade cover and to prevent erosion during turf establishment.

As described in Section 2.11, annual certifications indicating that the final vegetated soil cover has been maintained are required.

2.7 Erosion Controls

An important element of soil/fill management on this site is the mitigation and control of surface erosion from stormwater runoff. For this reason, a Master Erosion Control Plan to be used by all developers has been developed and incorporated as Attachment 2.

2.8 Dust Controls

Particulate monitoring will be performed along the downwind perimeter of the Site during subgrade excavation, grading, and handling activities in accordance with the NYSDOH Generic Community Monitoring Plan contained in Attachment 3 and the NYSDEC Technical Assistance and Guidance Memorandum (TAGM) 4031: Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites. Dust suppression techniques will be employed as necessary to mitigate fugitive dust from non-vegetated or disturbed soil/fill during post-remediation construction and redevelopment.

Techniques to be used may include one or more of the following:

- Applying water on haul roads.
- Wetting equipment and excavation faces.

- Hauling materials in properly tarped containers or vehicles.
- Restricting vehicle speeds on-site.
- Covering or proof-rolling excavated areas and materials after excavation activity ceases.
- Reducing the excavation size and/or number of excavations.

All reasonable attempts will be made to keep visible and/or fugitive dust to a minimum.

2.9 Fencing and Access Control

A chain-link fence that borders the property along Route 5 and a remote-control access gate at the Ridge Road guardhouse restrict access to the property. In addition, the southern access roads onto the property are gated and locked during non-business hours.

2.10 Property Use Limitations

The entire site has deed restrictions on file with the County of Erie that precludes use of groundwater from anywhere on the Site and only allows industrial use of the property. Industrial use may include manufacturing, assembling, warehousing, and related railroad, port, and shipping activities together with office space and other facilities including laboratories incidental to such uses. The zoning and/or deed restriction specifically prohibit day care centers and nursery schools as well as other facilities designed or intended to be primarily for use or occupancy by multiple numbers of persons under the age of 18 years (e.g., elementary, middle, or high schools). Final surface coverage requirements are outlined in Section 2.5. Upon transfer of ownership of the Site or portions of the Site, the new owner(s) will be responsible for adapting and implementing this SFMP in accordance with the deed restriction or revising this SFMP, and obtaining approval of the revised Plan from the NYSDEC.

Environmental easements will be part of the final corrective and remedial measures for the Site and filed with Erie County. These environmental easements may include:

- Use restrictions for industrial use in accordance with City of Lackawanna zoning ordinance and deed restriction (deed restriction presently exists; see Attachment 4).
- Restriction for the use of Site groundwater (deed restriction presently exists).

- Requirements for annual certification as discussed in Section 2.11.

2.11 Notification and Reporting Requirements

The NYSDEC and NYSDOH will be notified by Tecumseh or future property owners five working days prior to any new significant intrusive activities planned for the Site. A NY State licensed Professional Engineer or his/her designated representative shall inspect all subsurface excavation work for conformance with this SFMP.

By January 15 of each year, the site owner(s) shall complete and submit to the NYSDEC an annual report that contains certification that: the institutional controls put in place are still in place, have not been altered and are still effective; the remedy and protective cover have been maintained; and the conditions at the site are fully protective of public health and the environment. If the cover system has been breached during the year covered by the Annual Report, the site owner(s) shall include a certification that all work was performed in conformance with the SFMP and indicate the corrective action that was taken to repair the breach.

If a change of use, as defined in 6 NYCRR Part 375-2.2(a), were to occur at the Site, the following notification requirements (as contained in 6 NYCRR Part 375-1.11(d)) would apply:

(1) At least 60 days before a change of use at a site, the person proposing to make such change of use shall provide written notification to the Department.

(2) The notice shall advise the Department of the contemplated change, including, but not limited to, explaining how such change may affect the site's proposed, ongoing, or completed remedial program.

(3) Where such change results in a change in ownership or responsibility for the proposed, ongoing, or completed remedial program:

(i) such notice shall certify that the prospective purchaser has been provided a copy of any order, agreement or State assistance contract as well as a copy of all approved remedial work plans and reports; and

(ii) within 15 days of the transfer of all or part of the site, an additional notice shall be submitted to the Department which includes but is not limited to the name of the new owner and the new owner's contact information, including a contact representative and the contact information for such representative.

3.0 HEALTH AND SAFETY PROCEDURES

During redevelopment activities, the developer and site owner(s) are responsible for implementing suitable procedures to prevent both site construction workers and the community from adverse exposure to residual parameters of concern and other potential hazards posed by the redevelopment work. This will be accomplished through adherence to a written, parcel-specific worker Health and Safety Plan (HASP), prepared in accordance with the regulations contained in OSHA 29CFR 1910.120 and a Community Air Monitoring Plan prepared in conformance with NYSDOH requirements.

Although remedial measures undertaken under the corrective measures or Brownfield Cleanup Program are anticipated to reduce the potential for encountering parameters of concern above SCOs or ISMOs, the redevelopment activities governed by this SFMP are a required element of the CMS Order for the site. Thus, 29CFR 1910.120 indicates that these activities are subject to OSHA's hazardous waste operations and emergency response (Hazwopper) standard. This includes the requirement for preparation and implementation of a site-specific worker Health and Safety Plan addressing the following items:

- A safety and health or hazard analysis for each site task and operation.
- Employee training requirements.
- Personal protective equipment (PPE) to be used by employees for the site tasks.
- Medical surveillance requirements.
- Frequency and type of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of equipment.
- Site control measures.
- Decontamination procedures.
- An emergency response plan.
- Confined space entry procedures.
- A spill containment program.

As an integral component of the worker HASP, the developer and site owner(s) will be responsible for implementing a Community Air Monitoring Plan (CAMP) designed to

prevent the surrounding community from adverse exposures due to potential release/migration of airborne particulates or vapors. The community as referenced herein includes potential receptors located off-site (e.g., neighboring residents or businesses) as well as on-site receptors not directly involved in redevelopment activities (e.g., businesses or contractors occupying the site prior to final redevelopment). The New York State Department of Health Generic CAMP, presented as Attachment 3, will be implemented during redevelopment work involving disturbance or handling of Site slag/fill. The CAMP includes appropriate monitoring, mitigation and response measures consistent with NYSDOH and NYSDEC guidelines.

4.0 REFERENCES

1. Turnkey Environmental Restoration, LLC, *Site Investigation/Remedial Alternatives Report/Interim Remedial Measures Work Plan for the Steel Winds Site*, Lackawanna, New York, May 2006.

TABLES

TURNKEY ENVIRONMENTAL RESTORATION, LLC

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1

CRITERIA FOR USE OF OFF-SITE BACKFILL AS SUBGRADE MATERIAL

Soil/Fill Management Plan
Tecumseh Redevelopment Site
Lackawanna, New York

Parameter	TRACK 2 Restricted-Commercial or Industrial SCOs
Volatile Organic Compounds (mg/kg)	
1,1,1-Trichloroethane	0.68
1,1-Dichloroethane	0.27
1,1-Dichloroethene	0.33
1,2-Dichlorobenzene	1.1
1,2-Dichloroethane	0.02
1,2-Dichloroethene(cis)	0.25
1,2-Dichloroethene(trans)	0.19
1,3-Dichlorobenzene	2.4
1,4-Dichlorobenzene	1.8
1,4-Dioxane	0.1
Acetone	0.05
Benzene	0.06
Butylbenzene	12
Carbon tetrachloride	0.76
Chlorobenzene	1.1
Chloroform	0.37
Ethylbenzene	1
Hexachlorobenzene	3.2
Methyl ethyl ketone	0.12
Methyl tert-butyl ether	0.93
Methylene chloride	0.05
Propylbenzene-n	3.9
Sec-Butylbenzene	11
Tert-Butylbenzene	5.9
Tetrachloroethene	1.3
Toluene	0.7
Trichloroethene	0.47
Trimethylbenzene-1,2,4	3.6
Trimethylbenzene-1,3,5	8.4
Vinyl chloride	0.02
Xylene (mixed)	1.6
Semi-Volatile Organic Compounds (mg/kg)	
Acenaphthene	98
Acenaphthylene	107
Anthracene	500
Benzo(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1.7
Benzo(g,h,i)perylene	500
Benzo(k)fluoranthene	1.7
Chrysene	1
Dibenz(a,h)anthracene	0.56
Fluoranthene	500
Fluorene	386
Indeno(1,2,3-cd)pyrene	5.6
m-Cresol(s)	0.33

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

TABLE 1

CRITERIA FOR USE OF OFF-SITE BACKFILL AS SUBGRADE MATERIAL

Soil/Fill Management Plan
Tecumseh Redevelopment Site
Lackawanna, New York

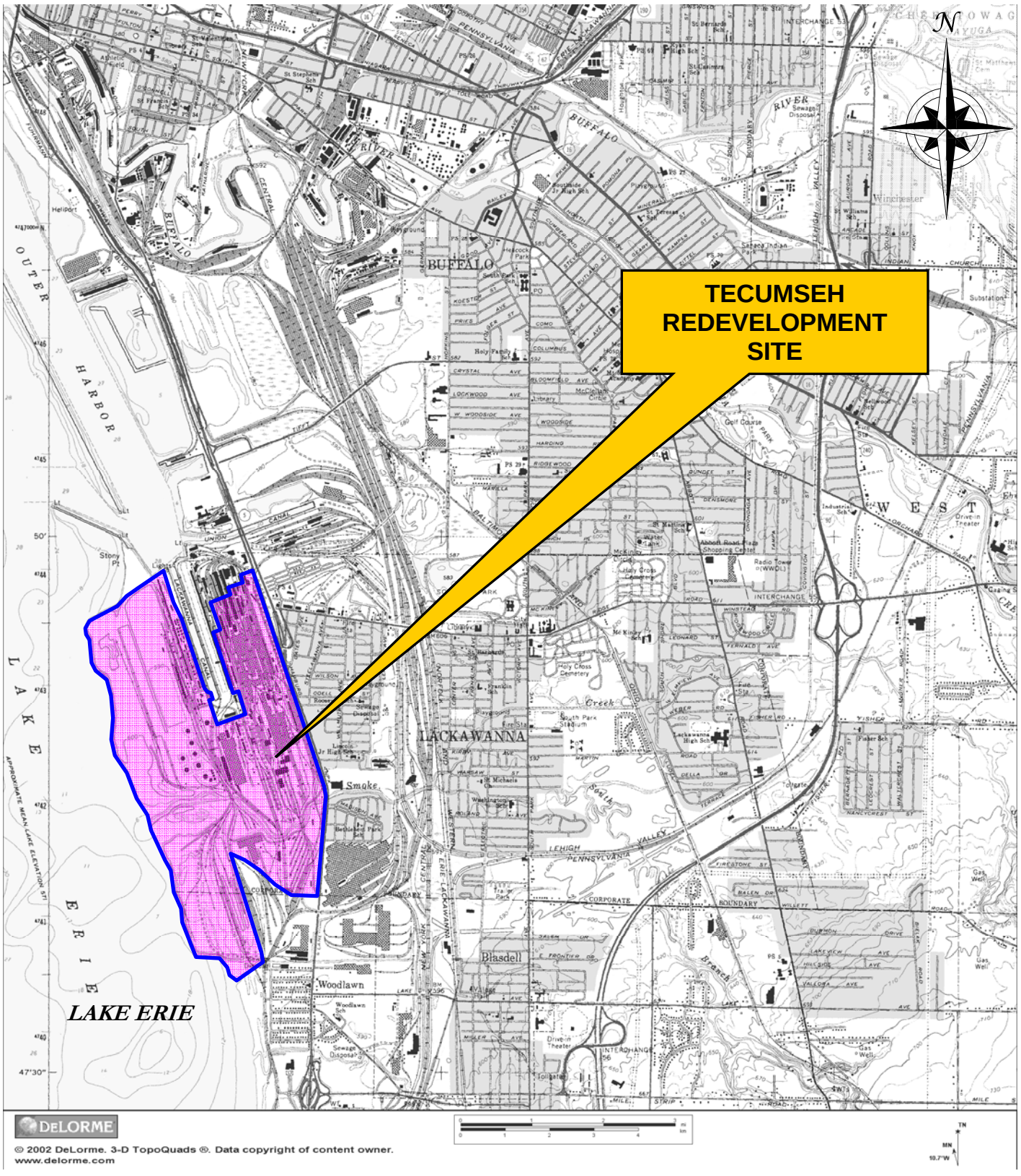
Parameter	TRACK 2 Restricted-Commercial or Industrial SCOs
Naphthalene	12
o-Cresol(s)	0.33
p-Cresol(s)	0.33
Pentachlorophenol	0.8
Phenanthrene	500
Phenol	0.33
Pyrene	500
Metals (mg/kg)	
Arsenic	16
Barium	400
Beryllium	47
Cadmium	7.5
Chromium, Hexavalent[1]	19
Chromium, Trivalent[1]	1500
Copper	270
Cyanide	27
Lead	450
Manganese	2000
Mercury (total)	0.73
Nickel	130
Selenium	4
Silver	8.3
Zinc	2480
PCBs/Pesticides (mg/kg)	
2,4,5-TP Acid (Silvex)	3.8
4,4'-DDE	17
4,4'-DDT	47
4,4'-DDD	14
Aldrin	0.19
Alpha-BHC	0.02
Beta-BHC	0.09
Chlordane (alpha)	2.9
Delta-BHC	0.25
Dibenzofuran	210
Dieldrin	0.1
Endosulfan I	102
Endosulfan II	102
Endosulfan sulfate	200
Endrin	0.06
Heptachlor	0.38
Lindane	0.1
Polychlorinated biphenyls	1

Notes:

1. The SCO for Hexavalent or Trivalent Chromium is considered to be met if the analysis for the total species of this contaminant is below the specific SCO for Hexavalent Chromium.

FIGURES

FIGURE 1



TURNKEY ENVIRONMENTAL RESTORATION, LLC

726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-635

PROJECT NO.: 0071-006-100

DATE: OCTOBER 2006

DRAFTED BY: BCH

SITE LOCATION AND VICINITY MAP

SOIL-FILL MANAGEMENT PLAN

TECUMSEH LACKAWANNA SITE
LACKAWANNA, NEW YORK

PREPARED FOR
TECUMSEH REDEVELOPMENT, INC.

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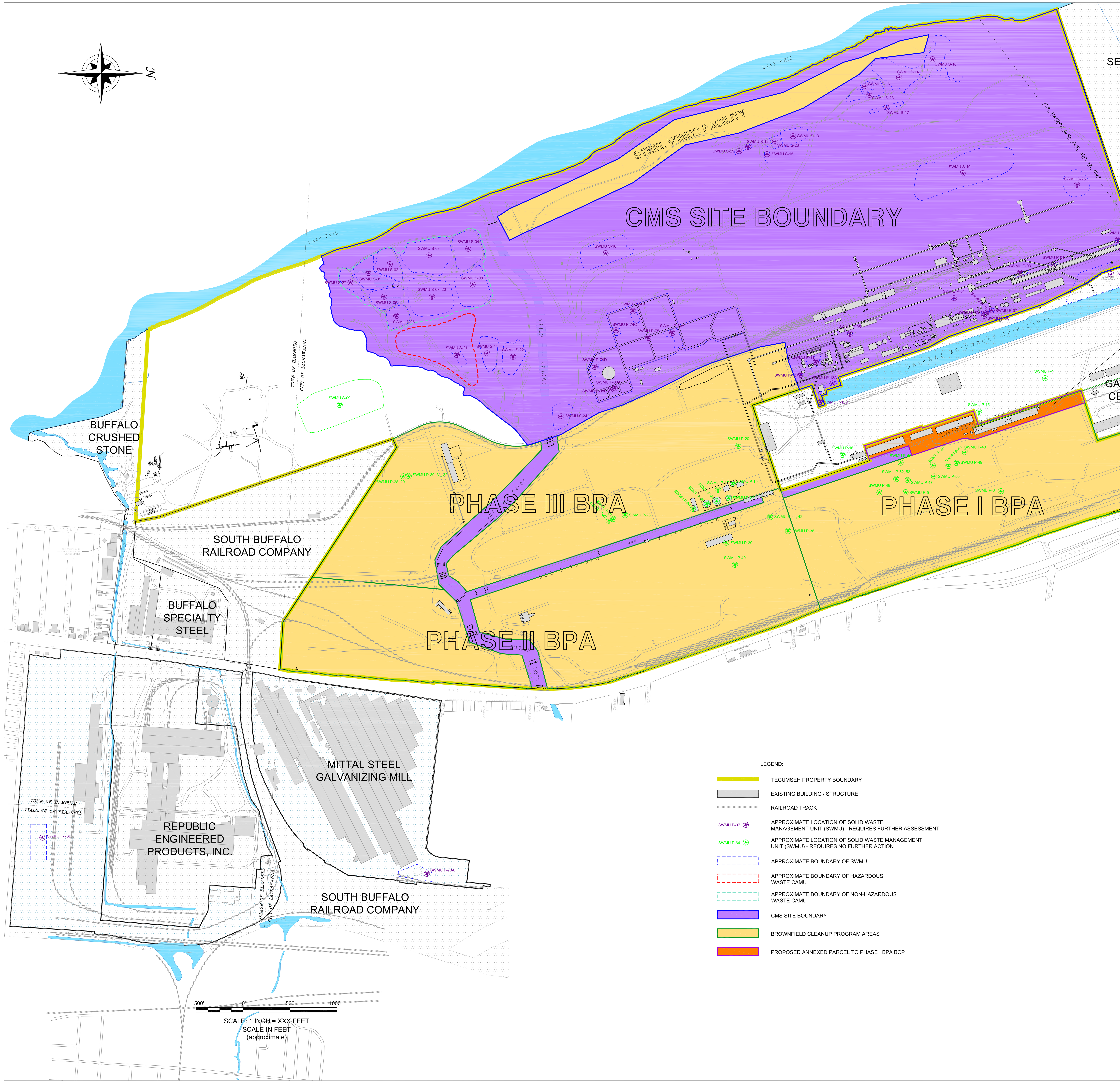

SOLID WASTE MANAGEMENT UNITS

SWMU ID	UNIT DESCRIPTION
P-01	Quench Water Pit, North Station
P-02	Quench Water Pit, Arctic Station
P-03	Quench Water Pit, Central Station
P-04	Quench Water Pit, A Station
P-05	Quench Water Pit, B Station
P-06	Lime Sludge Settling Basin
P-07	Abadoned Lime Sludge Settling Basin
P-08	Waste Oil Storage Tanks [in Tank Farm]
P-09	Abandoned Tar Decanter Sludge Pits
P-10	Contaminated Soil in Area Near Ball Mill
P-11	Benzol Plant Tank Storage Area
P-12	Spill Cleanup Soil Storage Area
P-13	[Blast Furnace] A-B Primary Thickener
P-14	[Blast Furnace] C Primary Thickener
P-15	[Blast Furnace] F-G Primary Thickener
P-16	[Blast Furnace] H-J Primary Thickener
P-17	[Blast Furnace] Final Thickener
P-18	[Blast Furnace] Cooling Tower and Hot & Cold Wells
P-19	[Sinter Plant] Thickener
P-20	[Sinter Plant] Scrubber Sump
P-21	[BOF] North Scalping Tank
P-22	[BOF] South Scalping Tank
P-23	[BOF] Primary Thickener
P-24	[BOF] North Clarifier
P-25	[BOF] South Clarifier
P-26	[BOF] Cooling Tower
P-27	[BOF] Final Thickener
P-28	[Slab Mill] Main Settling Tank
P-29	[Slab Mill] Five Sand Filters
P-30	[Slab Mill] North Scale Pit
P-31	[Slab Mill] South Scale Pit
P-32	[Slab Mill] Scarfer Pit
P-33	10" & 12" [Bar] Mills Scale Pit
P-34	13" [Bar] Mill Scale Pit
P-35	[Bar Mill] Process Water Pit
P-36	[Bar Mill] Sand Filter
P-37	[Bar Mill] Treated Water Storage Tank
P-38	54" Mill Scale Pit
P-39	48" Mill Scale Pit
P-40	14", 18", 28", & 35" Mills Scale Pit
P-41	Main Settling Tank [South Mills]
P-42	Five Sand Filters [South Mills]
P-43	44" Mill Scale Pit
P-44	40" Mill Scale Pit
P-45	36" Mill Scale Pit
P-46	32" Mill Scale Pit
P-47	30" Mill Scale Pit
P-48	21" Mill Scale Pit
P-49	44" Mill Scarfer Pit
P-50	40" Mill Scarfer Pit
P-51	30" & 21" Mills Scarfer Pit
P-52	Main Settling Tank [North Mills]
P-53	Seven Sand Filters [North Mills]
P-54	[Hot Strip Mill] Runout Table Spray Water Pit
P-55	[Hot Strip Mill] Scale Pit
P-56	[Hot Strip Mill] Main Settling Basin
P-57	[Hot Strip Mill] Twenty-Four Sand Filters
P-58	Bar Mill East Acid Sump [Coil Pickling Area]
P-59	Bar Mill West Acid Sump [Billet Prep. Area]
P-60	Bar Mill Waste Solution Tank
P-61	Hot Strip Mill Acid Pit
P-62	Mill Scale Storage Area 1
P-63	[Former] Mill Scale Storage Area 2
P-64	Scale Pit at 8" Bar Mill
P-65	Tandem Mill Sump
P-66	Pickling Rinse Water Pit
P-67	Spent Pickle Liquor Pit
P-68	Galvanizing Mill Sump
P-69	Main Treatment Tank and Associated Facilities [at Water Quality Control Station #7]
P-70	Hot Strip Mill Waste Oil Storage Tank [at Water Quality Control Station #7]
P-71	Galvanizing Mill Pump Station Wet Well for Old Acid Sewer Line
P-72	Galvanizing Mill Sump Sludge Storage Area
P-73	[Former] Drum Storage Area East of Cord Strip Mill
P-74	[Solid Fuel Mix Storage Piles in Tank Farm] (see note 3)
P-75	Tank Storage Area for No. 6 Fuel Oil and Petroleum Tar [Tank Farm]

Phase III Business Park Area: P-17, P-19 – P-27
Phase II Business Park Area: P-38 – P-42
Phase I Business Park Area: P-43 – P-53, P-64

SOLID WASTE MANAGEMENT UNITS

SWMU ID	UNIT DESCRIPTION
S-01	Surface Impoundment A
S-02	Surface Impoundment B
S-03	Surface Impoundment C (Hazardous Waste Unit)
S-04	Surface Impoundment D
S-05	Surface Impoundment E
S-06	Surface Impoundment F
S-07	Surface Impoundment G
S-08	Surface Impoundment H (not used)
S-09	Waste Pile I
S-10	Slag Quench Area J
S-11	Landfill K [Acid Tar Pit, South]
S-12	Asbestos Landfill L
S-13	Coal Tar Sludge (Hazardous Waste Unit)
S-14	General Rubble Landfill N
S-15	General Rubble Landfill O
S-16	[Lime Stabilized SPL Sludge/Slag Landfill] (see note 4)
S-17	Vacuum Carbonate Blowdown - Landfill Q
S-18	Lime Dust and Kish Landfill R
S-19	Murphy's Mountain Landfill AA
S-20	Drying Area for Sludge from Impoundment F
S-21	Sludge Storage Area
S-22	Vacuum Carbonate Blowdown Impoundment South of Smokes Creek [Acid Tar Pit North]
S-23	Tar Pit Adjacent to [Lime Stabilized SPL Sludge Landfill]
S-24	Tar Pit North of Lime Plant
S-25	Landfill / Impoundment Under North End of Coal Pile
S-26	Fill Area Near Coke Battery No. 8
S-27	Sludge Disposal Area [Adjacent to SWMU S-01)
S-28	Drum Landfill
S-29	Drum Landfill

WATER COURSES

DESCRIPTION
45" X 90" Slabbing Mill Return Water Trench (filled in)
Blasdell Creek
South Return Water Trench
North Return Water Trench
Smokes Creek
Gateway Metroport Ship Canal (formerly Lackawanna Ship Canal)

Notes:
1. Unit names are as shown in RFA (USEPA 1988), unless changed as shown with brackets " [ ] ".
2. Units colored green have received a "No Further Assessment" determination from USEPA.
3. Called "Waste Storage Piles (Tar and Tank Fuel Tank Bottoms Mixed with Coke Breeze)" in RFA (USEPA 1988).
4. Called "Spent Pickle Liquor Sludge Landfill P (Hazardous Waste Unit)" in RFA (USEPA 1988).

TURNKEY ENVIRONMENTAL RESTORATION, LLC
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BUFFALO, NEW YORK 14210
(716) 856-0635
JOB NO.: 0071-001-100

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY: BCH
DATE: OCTOBER 2006
CHECKED BY:
APPROVED BY:

SITE PLAN

SOIL-FILL MANAGEMENT PLAN
TECUMSEH LACKAWANNA SITE
LACKAWANNA, NEW YORK

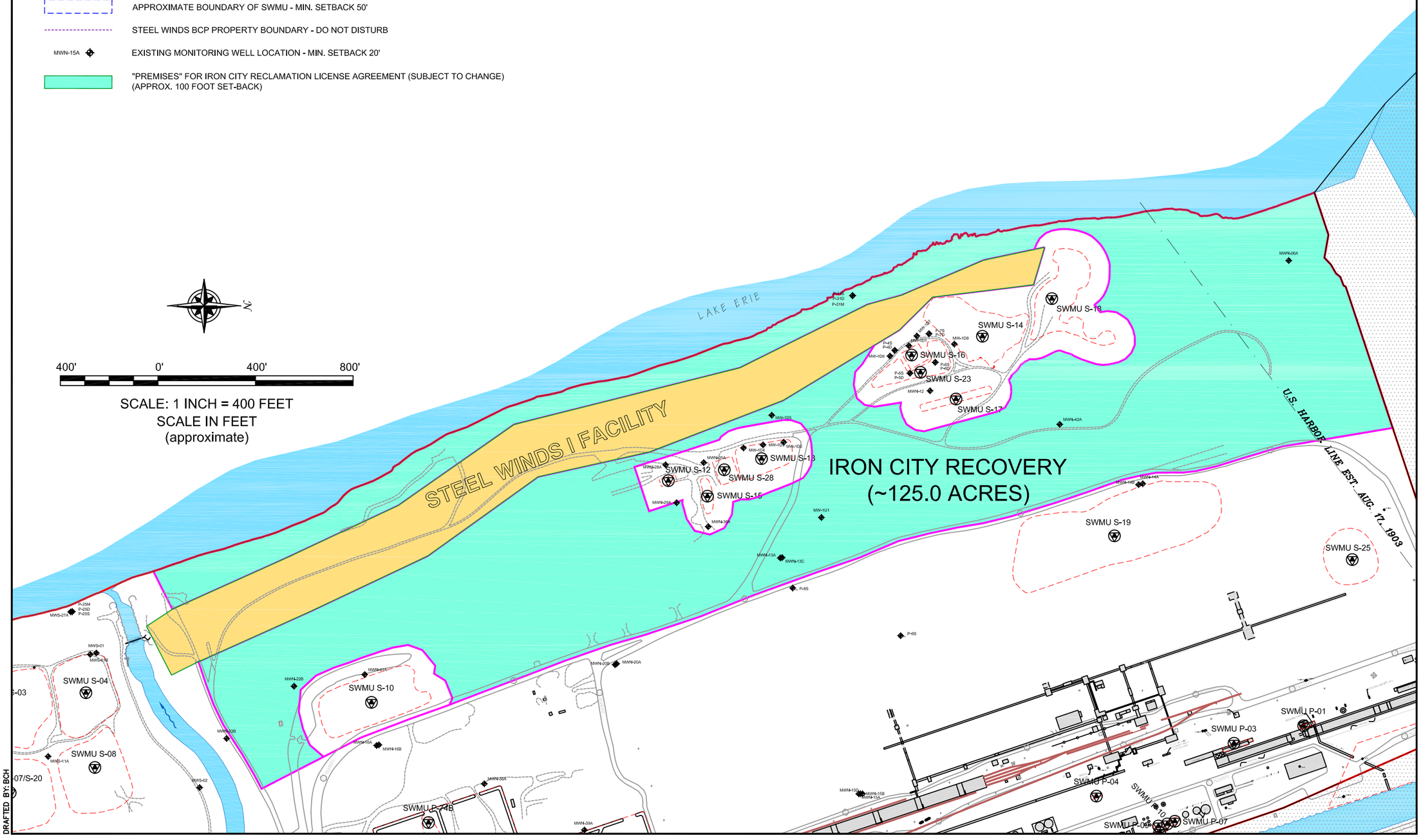
PREPARED FOR
TECUMSEH REDEVELOPMENT, INC.

FIGURE 2

F:\CAD\TurnKey\Tecumseh Redevelopment\RFI-CMS ORDER\CMS\CMS Work Plan\Appendix C; Soil-Fill Management Plan\Figure 3; Slag-Fill Areas Proposed for Excavation & Reclamation.dwg

LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- EXISTING BUILDING / STRUCTURE
- RAILROAD TRACK
- SWMU P-07 — APPROXIMATE LOCATION OF SOLID WASTE MANAGEMENT UNIT (SWMU)
- APPROXIMATE BOUNDARY OF SWMU - MIN. SETBACK 50'
- STEEL WINDS BCP PROPERTY BOUNDARY - DO NOT DISTURB
- MWN-15A — EXISTING MONITORING WELL LOCATION - MIN. SETBACK 20'
- "PREMISES" FOR IRON CITY RECLAMATION LICENSE AGREEMENT (SUBJECT TO CHANGE) (APPROX. 100 FOOT SET-BACK)



DATE: FEBRUARY 2009
DRAFTED BY: BCH

726 EXCHANGE STREET
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BUFFALO, NEW YORK 14210
(716) 856-0635

JOB NO.: 0071-008-111

SLAG/FILL AREA PROPOSED FOR EXCAVATION & RECLAMATION

SOIL/FILL MANAGEMENT PLAN

TECUMSEH LACKAWANNA SITE
LACKAWANNA, NEW YORK

PREPARED FOR
ARCELORMITTAL TECUMSEH REDEVELOPMENT, INC.

FIGURE 3

ATTACHMENT 1

STATISTICAL ANALYSIS TO DETERMINE INTERIM SOIL/FILL MANAGEMENT OBJECTIVES (ISMOS)

ATTACHMENT 1

STATISTICAL ANALYSIS TO DETERMINE INTERIM MANAGEMENT VALUES USING BROWNFIELD CLEANUP PROGRAM DATA

Soil/Fill Management Plan
Tecumseh Redevelopment Site
Lackawanna, New York

BCP Project	Location	Arsenic	Benzo(a)pyrene
Steel Winds I	TP-1 (0-2')	8.8	**18 J**
	TP-2 (2-4')	--	2.7 J
	TP-5 (0-2')	17.1	**20**
	TP-6 (0-2')	12.7	3.6
	TP-9 (0-2')	27.3	3.2
	TP-12 (0-2')	**99.2 E**	0.83 J
	TP-13 (0-2')	10.9 E	1.6 J
	TP-16 (0-2')	7.3 E	**57**
	TP-17 (0-2')	5.7 E	0.44 J
	TP-20 (0-2')	20.2 E	1.8
	TP-22 (0-2')	17.2 E	**6.5**
	TP-23 (0-2')	15.6 E	**6.4**
	TP-26 (0-1')	**45.4 E**	1.4 J
	TP-28 (0-2')	**130 E**	1.8 J
	TP-30 (0-2')	21.6	1.4 J
	TP-31 (0-2')	**44.5 E**	**15**
	TP-32 (0-2')	27.6 E	0.89 J
	TP-32 Blind	25.8 E	1.1
	TP-36 (0-2')	11.1	1.2 J
	TP-37 (0-2')	**53 E**	**13**
	TP-38 (0-2')	**32.3 E**	0.71 J
	TP-40 (0-2')	ND	1
	TP-42 (0-2')	22.7	1.1
	TP-43 (0-2')	6.5	0.34
	TP-45 (0-2')	11.1	1.2
	TP-45 Blind 2	11.9	0.95 J
	TP-47 (0-2')	10.8	0.77 J
	TP-49 (0-2')	11.2	3.1
	TP-50 (0-2')	7.2 E	0.91 J
	TP-50 Blind 3	9.9 E	0.97 J
	TP-51 (0-2')	**48.9**	0.63 J
	TP-54 (0-2')	4.7	0.22 J
	TP-56 (0-2')	**34**	1.9 J
	TP-58 (0-2')	9.1	**6.4**
	TP-59 (0-2')	19.9	1.2 J
	TP-60 (0-2')	9.7	1.3
	TP-62 (0-2')	22.1	1.4 J
	TP-64 (0-2')	6.3	0.66 J
	TP-65 (0-2')	18.9	0.2 J
	TP-69 (0-2')	13.1 EN*	1.2 J
	TP-70 (0-2')	**33.2 EN***	1.6 J
	TP-71 (0-2')	24.8 EN*	2.3 J

ATTACHMENT 1

STATISTICAL ANALYSIS TO DETERMINE INTERIM MANAGEMENT VALUES USING BROWNFIELD CLEANUP PROGRAM DATA

Soil/Fill Management Plan
Tecumseh Redevelopment Site
Lackawanna, New York

BCP Project	Location	Arsenic	Benzo(a)pyrene
Steel Winds I (continued)	TP-75 (0-2')	10.2 EN*	0.86 J
	TP-77 (0-2')	**63.2 EN***	1.9 J
	TP-79 (0-2')	21 EN*	0.055 J
	TP-80 (0-2')	25.6 EN*	2.8 J
	TP-80 Blind 4 (0-2')	18.3 EN*	3.8 J
	TP-81 (0-2')	**48.5**	4.1
	TP-82 (0-2')	**79**	**9**
	TP-83 (0-2')	9.7 E	1.8 J
	TP-84 (0-2')	11.7 E	0.84 J
	TP-85 (0-2')	16.8 E	1.2 J
	TP-86 (0-2')	**33 E**	1.2 J
	East Trench	24.3	**19**
	Middle Trench	143	4
	West Trench	**29.1**	4.3
BPA III	SS-01	14.7 N	0.46
	SS-02	4.6 NJ	0.53
	SS-03	5.9 NJ	3.4 J
	SS-04	28.3 NJ	0.3 J
	SS-05	3.3 NJ	0.46
	SS-06	3.2 NJ	0.058 J
	SS-07	6.2 NJ	2
	SS-08	8.1 NJ	2
	SS-09	11.2 NJ	1.1
	SS-10	7.7 NJ	0.14 J
	SS-11	3 NJ	3
	SS-12	3.7 NJ	0.51
	SS-13	5.3 J	4.6
	SS-14	9 J	1.8
	SS-15	24 J	0.045 J
	SS-16	--	0.085 J
	SS-17	14.1 J	0.82
	SS-28	5.7 J	1.1 J
	SS-19	5.1 J	1.2
	SS-20	12.3 J	2.3
	SS-21	5.1 J	0.71 J
	SS-22	4.3 J	0.34 J
	SS-23	3.2 J	4.2
	SS-26	15 J	3.1
	SS-27	5.4 J	0.36
	SS-28	5.7 J	1.1 J
	SS-29	17.2 J	2.9 J

ATTACHMENT 1

STATISTICAL ANALYSIS TO DETERMINE INTERIM MANAGEMENT VALUES USING BROWNFIELD CLEANUP PROGRAM DATA

Soil/Fill Management Plan
Tecumseh Redevelopment Site
Lackawanna, New York

BCP Project	Location	Arsenic	Benzo(a)pyrene
BPA I	TP-1-(1-5) Comp (0-2)	121	**8**
	TP-1-(6-10) Comp (0-2)	13.1	3.1
	TP- 1-(11-12) Comp (0-2)	25.4	**7.7**
	TP-1-(13-17) Comp (0-2)	21.2	2.5
	TP-2-(1-3) Comp (0-2)	10	**6.8 J**
	SS-23 (0-1)	7.8	1.5 J
	SS-24 (0-1)	--	**12**
	TP-3-(1-2) Comp (0-1)	11.6 J	**12**
	SS-(19-21) Comp (0-1)	11.8	**21**
	TP-4 (1-5) Comp (0-1)	9.3 J	4.2 J
	SS-25 (0-1)	7.6	1.6
	SS-26 (0-1)	12.6	--
	TP-5-(1-5) Comp (0-1)	12.8 J	**32**
	TP-5-(6-10) Comp (0-1)	23.5	4.4 J
	TP-5-11 (0-1)	7.5	0.75
	SS-(1-2) Comp (0-1)	13.2	1.7 J
	TP-6-(1-5) Comp (0-2)	14.7 J	**22 J**
	SS-29 (0-1)	--	2.5 J
	SS-30 (0-1)	18.5	--
	SS-31 (0-1)	--	0.51
	TP-7-(1-3)/8-4 Comp (0-2)	**116 J**	6.4 J
	TP-7-(4-7) Comp (0-1)	10 J	2 J
	TP-8-(1-3) Comp (0-1)	11.5 J	3.1 J
	SS-(32-33) Comp (0-1)	4.6 J	2.3
	SS-34 (0-1)	17.8	**7.2 J**
	TP-9-3 (0-1)	26.8	1.2
	TP-9-(1,2,5) Comp (0-1)	19.5 J	2 J
	SS-(10-13) Comp (0-1)	**79.8 J**	4.2
	SS-36 (0-1)	--	1.7 J
	TP-10-(1-3) Comp (0-1)	**29.5 J**	**6.4 J**
	TP-10-(4-5) Comp (0-1)	18.4 J	0.81

BOLD = Results exceeds 98% upper confidence level.

ATTACHMENT 1

STATISTICAL ANALYSIS TO DETERMINE INTERIM MANAGEMENT VALUES USING BROWNFIELD CLEANUP PROGRAM DATA

Soil/Fill Management Plan
Tecumseh Redevelopment Site
Lackawanna, New York

BCP Project	Statistical Parameter	Arsenic	Benzo(a)pyrene
Steel Winds I, BCP I, and BCP III	No. of Samples	107	112
	Mean (mg/kg)	22.5	4.01
	Std. Dev. (mg/kg)	26.5	7.23
	98th Percentile		
	Confidence Level (+/-)	5.96	1.59
	98% Upper Confidence Limit (mg/kg)	28.5	5.60
	# of Results > 98% UCL	17	20
	% of Total Samples	16%	18%

Explanation of Statistical Parameters

98% Confidence Level (+/-) = **CONFIDENCE**(**alpha**, **std. dev.**, **size**)

Where: **Alpha** = the significance level used to compute the confidence level.
The confidence level equals 100 x (1 - alpha)%.
For example, an alpha of 0.02 indicates a 98% confidence level.

Std. dev. = the population standard deviation for the data range.

Size = the number of samples

98% Upper Confidence Limit = Confidence Level + Mean

ATTACHMENT 2

MASTER EROSION CONTROL PLAN

ATTACHMENT 2

MASTER EROSION CONTROL PLAN
for
TECUMSEH REDEVELOPMENT SITE

LACKAWANNA, NEW YORK

October 2006 0071-008-111
Revised April 2009

Prepared for:

ARCELORMITTAL TECUMSEH REDEVELOPMENT, INC.

MASTER EROSION CONTROL PLAN
Tecumseh Redevelopment Site

Table of Contents

FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 Background and History

Tecumseh Redevelopment, Inc. (Tecumseh) owns approximately 1,100 acres of land at 1951 Hamburg Turnpike, approximately 2 miles south of the City of Buffalo. The majority of Tecumseh's property is located in the City of Lackawanna (the City), with portions of the property extending into the Town of Hamburg. The Tecumseh property is located on the west side of Route 5 (Hamburg Turnpike) on a portion of the site of the former Bethlehem Steel Corporation (BSC) Lackawanna Works in a historically industrial area. Tecumseh's property is bordered by: NY State Route 5 on the east; Lake Erie to the west and northwest; and other industrial properties to the south and the northeast.

The property was formerly used for the production of steel, coke and related products by Bethlehem Steel Corporation (BSC). Steel production on the property was discontinued in 1983 and the coke ovens ceased activity in 2001. Tecumseh acquired the property, along with other BSC assets, out of bankruptcy in 2003.

1.2 Purpose and Scope

A Soil/Fill Management Plan (SFMP) was prepared as part of the Corrective Measures Study (CMS) Work Plan and describes protocols to protect both the environment and human health by screening and identifying areas of soil/fill contamination during redevelopment of the Site. The property owner(s) at the time of the construction will be responsible for all monitoring, implementation and reporting requirements of the SFMP.

Since erosion control will be a critical component of preventing the potential migration of contaminants onto developed property or off-site during construction activities on the site, this Master Erosion Control Plan (MECP) was prepared to provide guidance to during construction activities. This MECP is a critical component of the SFMP. This document is generic in nature and provides minimum erosion control practices to be used by property owner(s).

2.0 GENERAL PERMIT REQUIREMENTS

If construction activities disturb more than 1 acre of land, the Federal Water Pollution Control Act (as amended, 33 U.S.C. 1251 et. seq.) and the New York State Environmental Conservation Law (Article 17, Titles 7 and 8, and Article 70) would apply.

With some exceptions, operators of construction activities that will result in the disturbance of 1 or more acres of land must obtain coverage under SPDES General Permit (GP-02-01) prior to the commencement of soil disturbance. Also requiring a permit are construction activities disturbing less than 1 acre if they are part of a larger common plan of development or sale with a planned disturbance of equal to or greater than 1 acre, or activities that are designated by the NYSDEC. The NYSDEC can require a permit for construction activities disturbing less than 1 acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

To obtain coverage under the general permit, the operator of a construction activity must file a completed Notice of Intent (NOI) with the NYSDEC. Submitting a NOI is an affirmation that a Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the site and will be implemented prior to the commencement of construction activities. Coverage under the general permit will begin either 5 or 60 business days after receipt of a completed NOI by the NYSDEC. Figure 1 is a flowchart to be used in determining whether a SWPPP will be required during site redevelopment construction activities.

If a site has a NYSDEC-approved work plan under a CERCLA, RCRA, or Voluntary Cleanup Agreement and has prepared a SWPPP that meets the substantive requirements of GP-02-01, they do not need to obtain permit coverage. It is anticipated that the redevelopment will meet Conditions B and C in Part III.A.1.b of the General Permit; therefore, the SWPPP must include erosion and sediment controls as well as water quantity and quality controls (post-construction stormwater controls).

3.0 POTENTIAL EROSION CONTROL CONCERNS

Potential areas and items of concern during site construction activities include the following:

- Vegetative or other (e.g., asphalt, buildings, concrete) surface coverage may be required as a pre-condition of occupancy in certain areas of the redeveloped site. The transportation and placement activities associated with this work will require erosion and sediment controls to prevent the surface soil from being washed off the area being developed.

- Remediated areas or off-site properties adjacent to the construction activity need protection so they do not become impacted by site operations.

- Storm water inlets will require protective measures to limit sediment transfer to storm sewers.

- Runoff from soil stockpiles will require erosion controls.

- Surface slopes need to be minimized as much as practical to control sediment transfer.

- Soil/fill excavated during construction will require proper handling and disposal as described in the SFMP.

4.0 EROSION CONTROL MEASURES

4.1 Background

Standard soil conservation practices need to be incorporated into the construction plans to mitigate soil erosion damage, off-site sediment migration, and water pollution from erosion. These practices combine vegetative and structural measures, many of which will be permanent in nature and become part of the completed project (i.e., drainage channels and grading). Other measures will be temporary and serve only during the construction stage. Selected erosion and sediment control measures will meet the following criteria:

- Minimize erosion through project design (maximum slopes, phased construction, etc.).
- Incorporate temporary and permanent erosion control measures.
- Remove sediment from sediment-laden storm water before it leaves the site.

4.2 Temporary Measures

Temporary erosion and sedimentation control measures and facilities will be used during construction. These measures will be installed and maintained by the property owner(s) until they are either no longer needed or until such time as permanent measures are installed and become effective. At a minimum, the following temporary measures will be used:

- Silt fencing
- Straw/hay bales
- Temporary vegetation/mulching
- Temporary sedimentation basins
- Cautious placement, compaction and grading of stockpiles

Appendix A presents erosion control details.

4.2.1 Silt Fencing

Construction and regrading activities will result in surface water flow to drainage ditches and swales, storm sewers, and adjacent properties. Silt fencing will be the primary sediment control measure used in these areas. Prior to extensive soil excavation or grading activities, silt fences will be installed along the perimeter of all construction areas. The orientation of the fencing will be adjusted as necessary as the work proceeds to accommodate changing site conditions. Intermediate fencing will be utilized upgradient of the perimeter fencing to help lower surface water runoff velocities and reduce the volume of sediment to perimeter fencing. Stockpiles will also be surrounded with silt fencing.

As sediment collects, the silt fences will be cleaned as necessary to maintain their integrity. Removed sediment will be utilized elsewhere on-site as general fill. All perimeter silt fences will remain in place until construction activities in an area are completed and vegetative cover has been established.

4.2.2 Straw and/or Hay Bales

Straw and/or hay bales will be used to intercept sediment laden storm water runoff in drainage channels during construction. The use of either hay or straw will be based on the availability of materials at the time of construction. Bales will be placed in swales and ditches where the anticipated flow velocity is not expected to be greater than 5 feet/second (fps). Intermediate bales will be placed upgradient of the final barrier to reduce flow velocities and sediment loadings where higher velocities are anticipated.

As with silt fencing, sediment will be removed as necessary from behind the bales and disposed of on-site. Bales that have become laden with sediment or that have lost their structural integrity or effectiveness due to the weather will be replaced.

4.2.3 Cautious Placement of Stockpiles

Excavation activities will produce stockpiles of soil and subgrade soil/fill materials. Careful placement and construction of stockpiles will be required to control erosion. Stockpiles will be placed no closer than 50 feet from storm water inlets and parcel boundaries. Additionally, stockpiles will be graded and compacted as necessary for positive surface water runoff and dust control. Impacted stockpiles will be underlain and covered with secured polyethylene tarpaulin until proper disposal has been secured.

4.3 Permanent Control Measures During Site Redevelopment

Permanent erosion and sedimentation control measures and structures will be installed as soon as practical during construction for long-term erosion protection. Examples of permanent erosion control measures include:

- Using maximum slopes in erosion prone areas to limit erosion.
- Minimizing the potential contact with, and migration of, subsurface soil/fill through the placement of a "clean" soil cover system in all areas not covered with structures, roads, parking areas, sidewalks, etc.
- Planting and maintaining vegetation.
- Limiting runoff flow velocities to the extent practical.
- Lining collection channels with riprap, erosion control fabric, vegetation, or similar materials.

5.0 CONSTRUCTION MANAGEMENT PRACTICES

5.1 General

The following general construction practices should be evaluated for erosion and sedimentation control purposes during site construction activities:

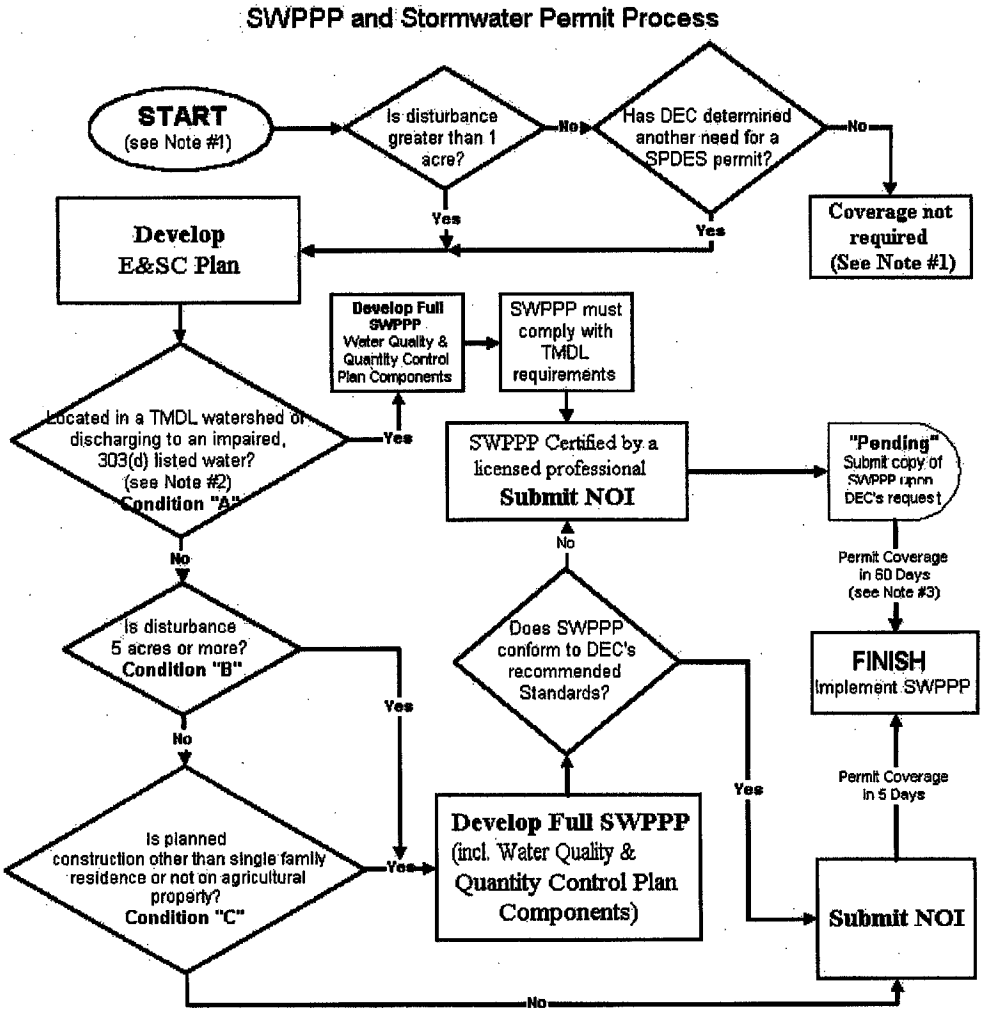
- Clearing and grading only as much area as is necessary to accommodate the construction needs to minimize disturbance of areas subject to erosion (i.e. phasing the work).
- Covering exposed or disturbed areas of the site as quickly as practical.
- Installed all erosion and sediment control measures prior to disturbing the site subgrade.
- Minimizing both on-site and off-site tracking of soil by vehicles by utilizing routine entry/exit routes.

5.2 Monitoring, Inspection, and Maintenance

All erosion and sedimentation controls described in this Plan should be inspected by a qualified representative of the property owner(s) within 24 hours of a heavy rainfall event (defined as more than 1 inch of precipitation in a 24-hour period) and repaired or modified as necessary to effectively control erosion of turbidity problems. Inspections should include areas under construction, stockpile areas, erosion control devices (i.e., silt fences, hay bales, etc.), and entry/exit routes. Routine inspections of the entire site should also be made during the construction. If inspections indicate problems, corrective measures should be implemented within 24 hours.

FIGURES

FIGURE 1



NOTES:

1. Under any of the above conditions other environmental permits may be required. DEC may require permit for construction disturbance < 1 acre on a case by case basis.
2. **and** the following exists: construction and/or stormwater discharges from the construction or post-construction site contain the pollutant of concern identified in the TMDL or 303(d) listing.
3. After receipt by DEC of completed application.

APPENDIX A

EROSION CONTROL DETAILS

- *Silt Fence*
- *Straw Bale Dike*
- *Perimeter Dike/Swale*
- *Temporary Swale*
- *Sediment Trap for Drop Inlet*

STANDARD AND SPECIFICATIONS FOR SILT FENCE

Definition

A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Steepness	Maximum Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

2. Maximum drainage area for overland flow to a silt fence shall not exceed ¼ acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence; and

3. Erosion would occur in the form of sheet erosion; and

4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff. All silt fences shall be placed as close to the areas as possible, but at least 10 feet from the toe of a slope to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.

Sensitive areas to be protected by silt fence may need to be reinforced by using heavy wire fencing for added support to prevent collapse.

Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. A detail of the silt fence shall be shown on the plan. See Figure 5A.8 on page 5A.21 for details.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682

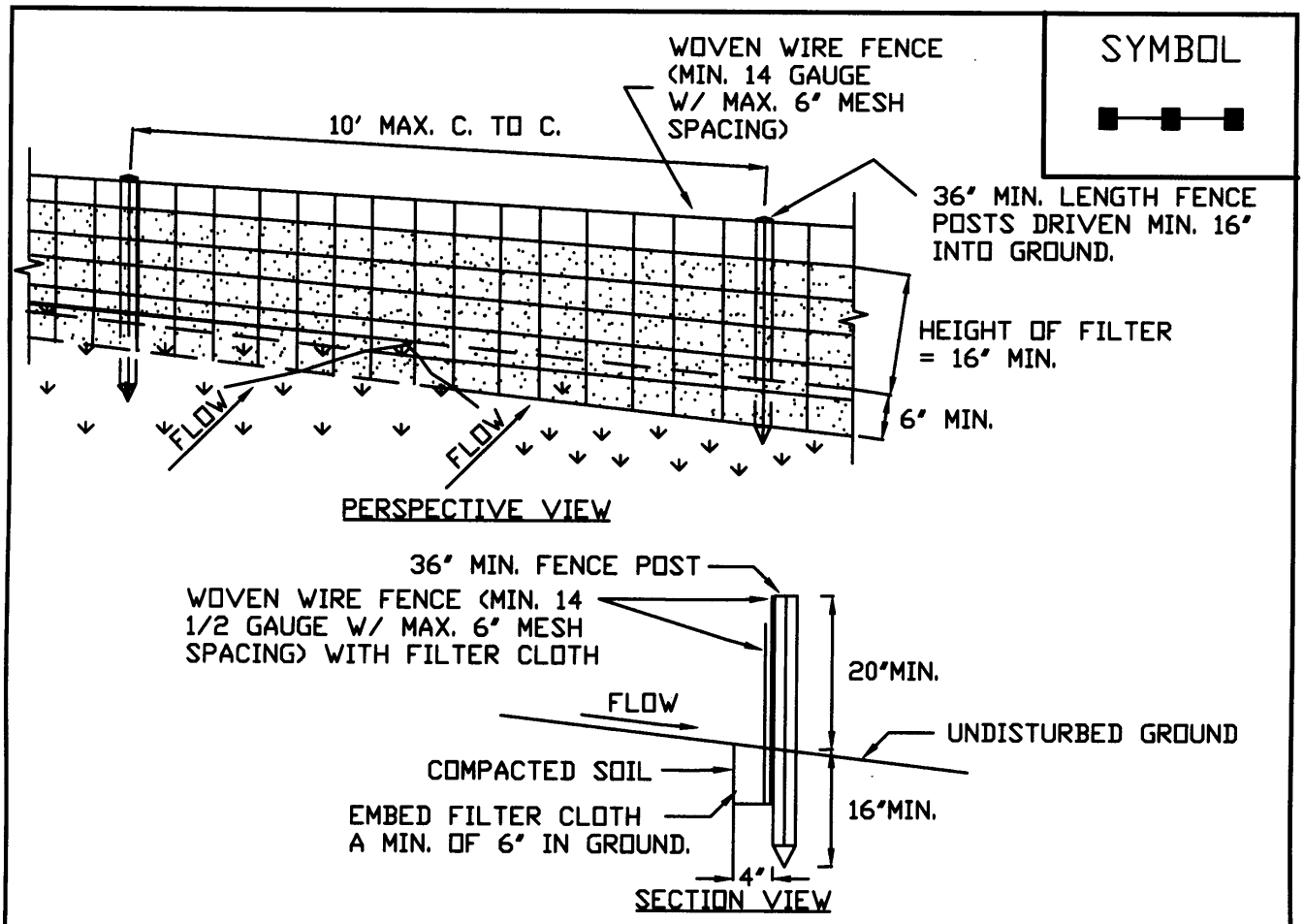
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	
Equivalent Opening Size	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability (%)	90	ASTM G-26

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.

3. Wire Fence (for fabricated units): Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

4. Prefabricated Units: Envirofence, Geofab, or approved equal, may be used in lieu of the above method providing the unit is installed per details shown in Figure 5A.8.

Figure 5A.8
Silt Fence



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	SILT FENCE

STANDARD AND SPECIFICATIONS FOR STRAW BALE DIKE

Definition

A temporary barrier of straw, or similar material, used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a bale dike is to reduce runoff velocity and effect deposition of the transported sediment load. Straw bale dikes have an estimated design life of three (3) months.

Conditions Where Practice Applies

The straw bale dike is used where:

1. No other practice is feasible.
2. There is no concentration of water in a channel or other drainage way above the barrier.
3. Erosion would occur in the form of sheet erosion.
4. Length of slope above the straw bale dike does not exceed these limits.

Constructed Slope	Percent Slope	Slope Length (ft.)
2:1	50	25
3:1	33	50
4:1	25	75

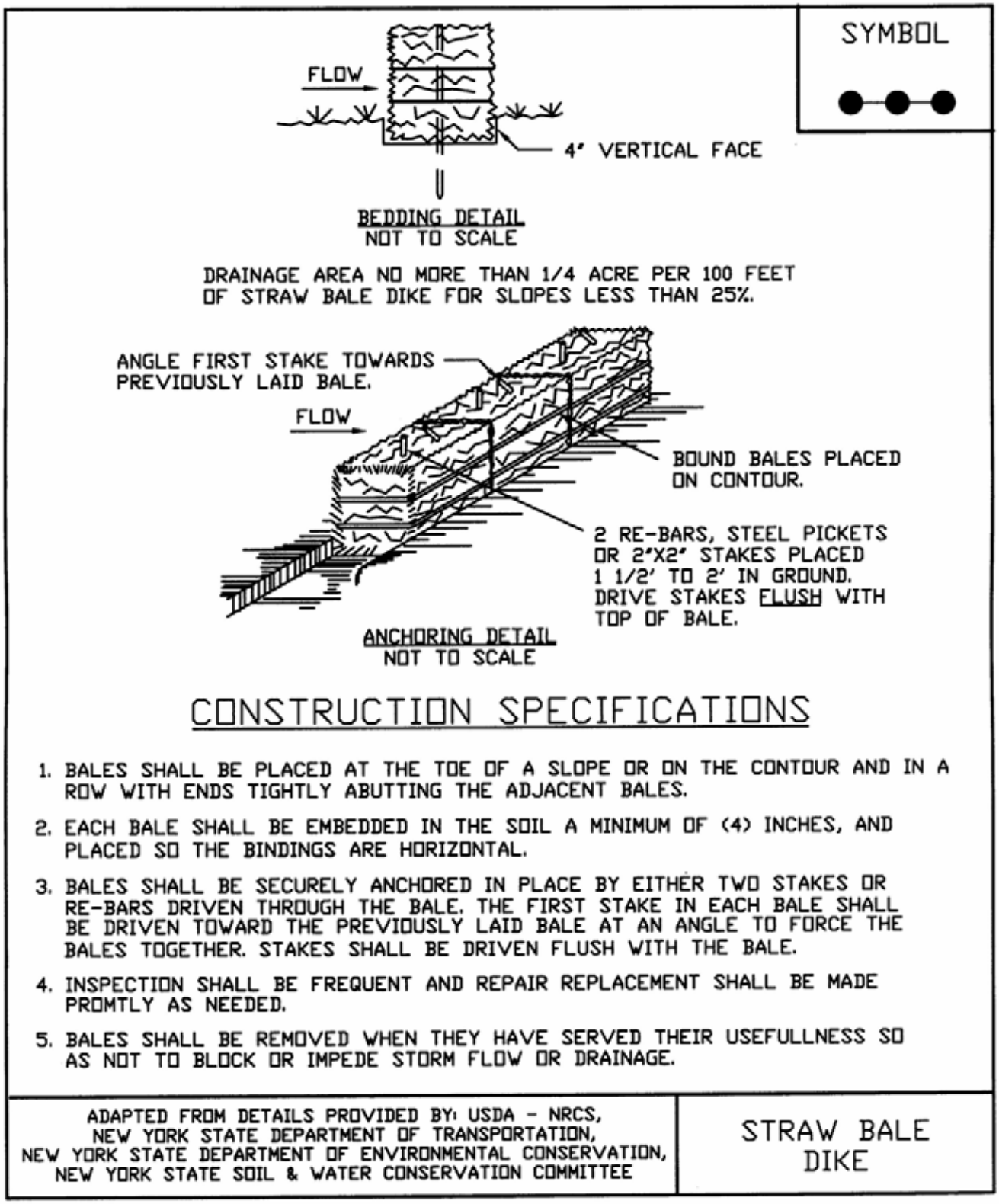
Where slope gradient changes through the drainage area, steepness refers to the steepest slope section contributing to the straw bale dike.

The practice may also be used for a single family lot if the slope is less than 15 percent. The contributing drainage areas in this instance shall be less than one quarter of an acre per 100 feet of fence and the length of slope above the dike shall be less than 200 feet.

Design Criteria

The above table is adequate, in general, for a one-inch rainfall event. Larger storms could cause failure of this practice. Use of this practice in sensitive areas for longer than one month should be specifically designed to store expected runoff. All bales shall be placed on the contour with cut edge of bale adhering to the ground. See Figure 5A.7 on page 5A.18 or details.

Figure 5A.7
Straw Bale Dike



STANDARD AND SPECIFICATIONS FOR PERIMETER DIKE/SWALE

Definition

A temporary ridge of soil excavated from an adjoining swale located along the perimeter of the site or disturbed area.

Purpose

The purpose of a perimeter dike/swale is to prevent off site storm runoff from entering a disturbed area and to prevent sediment laden storm runoff from leaving the construction site or disturbed area.

Conditions Where Practice Applies

Perimeter dike/swale is constructed to divert flows from entering a disturbed area, or along tops of slopes to prevent flows from eroding the slope, or along base of slopes to direct sediment laden flows to a trapping device.

The perimeter dike/swale shall remain in place until the disturbed areas are permanently stabilized.

Design Criteria

See Figure 5A.3 on page 5A.8 for details.

The perimeter dike/swale shall not be constructed outside the property lines without obtaining legal easements from affected adjacent property owners. A design is not required for perimeter dike/swale. The following criteria shall be used:

Drainage area – Less than 2 acres (for drainage areas larger than 2 acres but less than 10 acres, see earth dike or temporary swale; for drainage areas larger than 10 acres, see standard and specifications for diversion).

Height – 18 inches minimum from bottom of swale to top of dike evenly divided between dike height and swale depth.

Bottom width of dike – 2 feet minimum.

Width of swale – 2 feet minimum.

Grade – Dependent upon topography, but shall have positive drainage (sufficient grade to drain) to an adequate outlet. Maximum allowable grade not to exceed 8 percent.

Stabilization – The disturbed area of the dike and swale shall be stabilized within 7 days of installation, in accordance with the standard and specifications for temporary swales.

Outlet

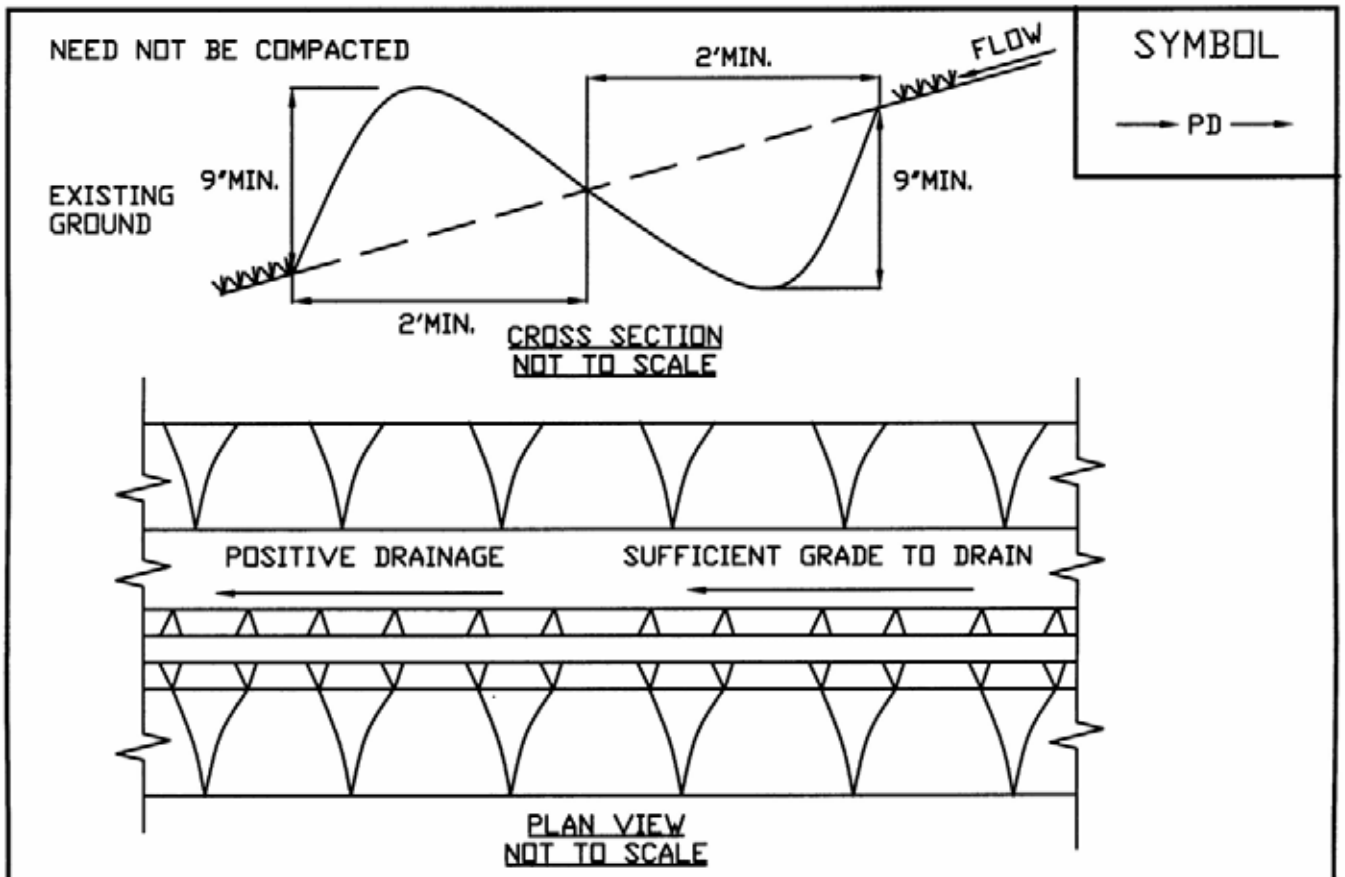
1. Perimeter dike/swale shall have a stabilized outlet.

2. Diverted runoff from a protected or stabilized upland area shall outlet directly onto an undisturbed stabilized area.

3. Diverted runoff from a disturbed or exposed upland area shall be conveyed to a sediment trapping device such as a sediment trap, sediment basin, or to an area protected by any of these practices.

4. The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet.

Figure 5A.3
Perimeter Dike/Swale



CONSTRUCTION SPECIFICATIONS

1. ALL PERIMETER DIKE/SWALE SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSION VELOCITY.
4. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED IN THE STANDARD.
5. STABILIZATION OF THE AREA DISTURBED BY THE DIKE AND SWALE SHALL BE DONE IN ACCORDANCE WITH THE STANDARD AND SPECIFICATIONS FOR TEMPORARY SEEDING AND MULCHING, AND SHALL BE DONE WITHIN 10 DAYS.
6. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

MAX. DRAINAGE AREA LIMIT: 2 ACRES

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

PERIMETER DIKE OR SWALE

STANDARD AND SPECIFICATIONS FOR TEMPORARY SWALE

Definition

A temporary excavated drainage way.

Purpose

The purpose of a temporary swale is to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet or to intercept sediment laden water and divert it to a sediment trapping device.

Conditions Where Practice Applies

Temporary swales are constructed:

1. to divert flows from entering a disturbed area.

2. intermittently across disturbed areas to shorten overland flow distances.

3. to direct sediment laden water along the base of slopes to a trapping device.

4. to transport offsite flows across disturbed areas such as rights-of-way.

Swales collecting runoff from disturbed areas shall remain in place until the disturbed areas are permanently stabilized.

Design Criteria

See Figure 5A.2 on page 5A.5 for details.

	Swale A	Swale B
Drainage Area	<5 Ac	5-10 Ac
Bottom Width of Flow Channel	4 ft	6 ft
Depth of Flow Channel	1 ft	1 ft
Side Slopes	2:1 or flatter	2:1 or flatter
Grade	0.5% Min. 20% Max.	0.5% Min. 20% Max.

For drainage areas larger than 10 acres, refer to the Standard and Specification for Waterways on page 5B.11.

Stabilization

Stabilization of the swale shall be completed within 7 days of installation in accordance with the appropriate standard and specifications for vegetative stabilization or stabilization with mulch as determined by the time of year. The flow channel shall be stabilized as per the following criteria:

Type of Treatment	Channel Grade[1]	Flow Channel A (<5 Ac.)	Flow Channel B (5-10 Ac)
1	0.5-3.0%	Seed & Straw Mulch	Seed & Straw Mulch
2	3.1-5.0%	Seed & Straw Mulch	Seed and cover with RECP, Sod, or lined with plastic or 2 in. stone
3	5.1-8.0%	Seed and cover with RECP, Sod, or line with plastic or 2 in. stone	Line with 4-8 in. or stone or Recycled Concrete Equivalent[2] or geotextile
4	8.1-20%	Line with 4-8 in. stone or Recycled Concrete Equivalent[2] or geotextile	Site Specific Engineering Design

[1] In highly erodible soils, as defined by the local approving agency, refer to the next higher slope grade for type of stabilization.
[2] Recycled Concrete Equivalent shall be concrete broken into the required size, and shall contain no steel reinforcement.

Outlet

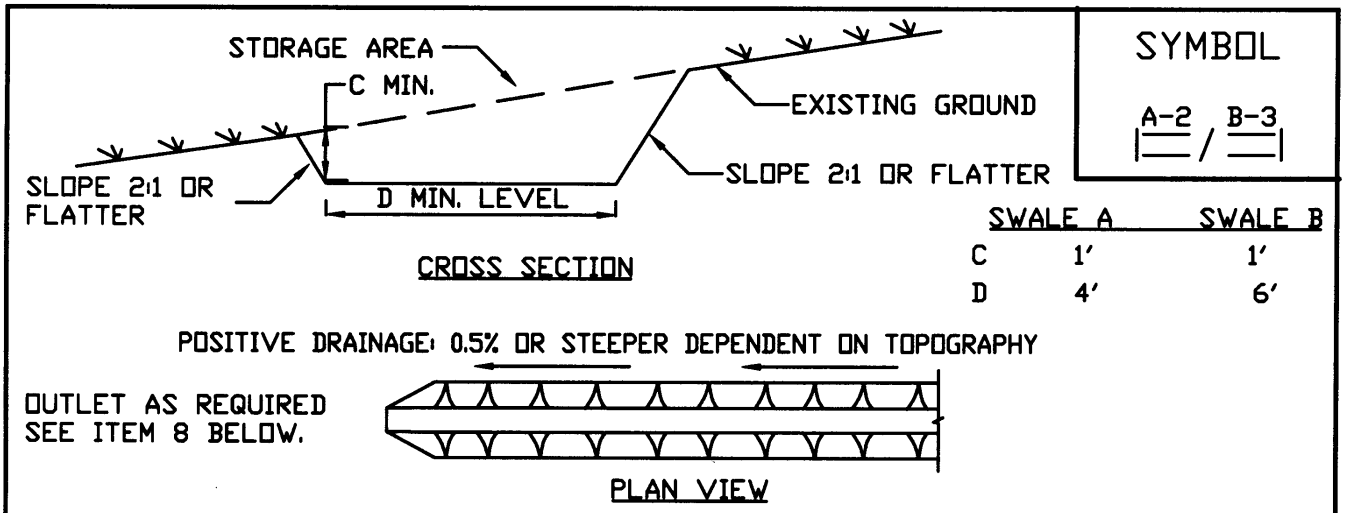
Swale shall have an outlet that functions with a minimum of erosion, and dissipates runoff velocity prior to discharge off the site.

Runoff shall be conveyed to a sediment trapping device such as a sediment trap or sediment basin until the drainage area above the swale is adequately stabilized.

The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet condition.

If a swale is used to divert clean water flows from entering a disturbed area, a sediment trapping device may not be needed.

Figure 5A.2
Temporary Swale



CONSTRUCTION SPECIFICATIONS

1. ALL TEMPORARY SWALES SHALL HAVE UNINTERUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
5. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILLS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE SWALE.
8. STABILIZATION SHALL BE AS PER THE FLOW CHANNEL STABILIZATION CHART BELOW:

TYPE OF TREATMENT	CHANNEL GRADE	A(5 AC. OR LESS)	B(5 AC -10AC)
1	0.5-3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1-5.0%	SEED AND STRAW MULCH	SEED AND COVER USING RECP
3	5.1-8.0%	SEED AND COVER WITH RECP	LINED WITH 4-8" RIP-RAP OR GEOTEXTILE
4	8.1-20.%	LINED WITH 4-8" RIP-RAP OR GEOTEXTILE	ENGINEERED DESIGN

9. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

TEMPORARY SWALE

STANDARD AND SPECIFICATIONS FOR SEDIMENT TRAP

Definition

A temporary sediment control device formed by excavation and/or embankment to intercept sediment laden runoff and retain the sediment.

Purpose

The purpose of the structure is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties, and rights-of-way below the sediment trap from sedimentation.

Conditions Where Practice Applies

A sediment trap is usually installed in a drainage way, at a storm drain inlet, or other points of collection from a disturbed area.

Sediment traps should be used to artificially break up the natural drainage area into smaller sections where a larger device (sediment basin) would be less effective.

Design Criteria

If any of the design criteria presented here cannot be met, see Standard and Specification for Sediment Basin on page 5A.49.

Drainage Area

The drainage area for sediment traps shall be in accordance with the specific type of sediment trap used (Type I through V).

Location

Sediment traps shall be located so that they can be installed prior to grading or filling in the drainage area they are to protect. Traps must not be located any closer than 20 feet from a proposed building foundation if the trap is to function during building construction. Locate traps to obtain maximum storage benefit from the terrain and for ease of cleanout and disposal of the trapped sediment.

Trap Size

The volume of a sediment trap as measured at the elevation of the crest of the outlet shall be at least 3,600 cubic feet per acre of drainage area. The volume of a constructed trap shall be calculated using standard mathematical procedures. The volume of a natural sediment trap may be approximated by the equation: Volume (cu.ft.) = 0.4 x surface area (sq.ft.) x maximum depth (ft.).

Trap Cleanout

Sediment shall be removed and the trap restored to the original dimensions when the sediment has accumulated to ½ of the design depth of the trap. Sediment removed from the trap shall be deposited in a protected area and in such a manner that it will not erode.

Embankment

All embankments for sediment traps shall not exceed five (5) feet in height as measured at the low point of the original ground along the centerline of the embankment. Embankments shall have a minimum four (4) foot wide top and side slopes of 2:1 or flatter. The embankment shall be compacted by traversing with equipment while it is being constructed. The embankment shall be stabilized with seed and mulch as soon as it is completed

The elevation of the top of any dike directing water to any sediment trap will equal or exceed the maximum height of the outlet structure along the entire length of the trap.

Excavation

All excavation operations shall be carried out in such a manner that erosion and water pollution shall be minimal. Excavated portions of sediment traps shall have 1:1 or flatter slopes.

Outlet

The outlet shall be designed, constructed, and maintained in such a manner that sediment does not leave the trap and that erosion at or below the outlet does not occur.

Sediment traps must outlet onto stabilized (preferable undisturbed) ground, into a watercourse, stabilized channel, or into a storm drain system. Distance between inlet and outlet should be maximized to the longest length practicable.

Trap Details Needed on Erosion and Sediment Control Plans

Each trap shall be delineated on the plans in such a manner that it will not be confused with any other features. Each trap on a plan shall indicate all the information necessary to properly construct and maintain the structure. If the drawings are such that this information cannot be delineated on the drawings, then a table shall be developed. If a table is developed, then each trap on a plan shall have a number and the numbers shall be consecutive.

The following information shall be shown for each trap in a summary table format on the plans.

1. Trap number
2. Type of trap
3. Drainage area
4. Storage required
5. Storage provided (if applicable)
6. Outlet length or pipe sizes
7. Storage depth below outlet or cleanout elevation
8. Embankment height and elevation (if applicable)

Type of Sediment Traps

There are five (5) specific types of sediment traps which vary according to their function, location, or drainage area.

I. Pipe Outlet Sediment Trap
II. Grass Outlet Sediment Trap
III. Catch Basin Sediment Trap
IV. Stone Outlet Sediment Trap
V. Riprap Outlet Sediment Trap

I. Pipe Outlet Sediment Trap

A Pipe Outlet Sediment Trap consists of a trap formed by embankment or excavation. The outlet for the trap is through a perforated riser and a pipe through the embankment. The outlet pipe and riser shall be made of steel, corrugated metal or other suitable material. The top of the embankment shall be at least 1 ½ feet above the crest of the riser. The top 2/3 of the riser shall be perforated with one (1) inch nominal diameter holes or slits spaced six (6) inches vertically and horizontally placed in the concave portion of the corrugated pipe.

No holes or slits will be allowed within six (6) inches of the top of the horizontal barrel. All pipe connections shall be watertight. The riser shall be wrapped with ½ to ¼ inch hardware cloth wire then wrapped with filter cloth with a sieve size between #40-80 and secured with strapping or connecting band at the top and bottom of the cloth. The cloth shall cover an area at least six (6) inches above the highest hole and six (6) inches below the lowest hole. The top of the riser pipe shall not be covered with filter cloth. The riser shall have a base with sufficient weight to prevent flotation of the riser. Two approved bases are:

1. A concrete base 12 in. thick with the riser embedded 9 in. into the concrete base, or

2. One quarter inch, minimum, thick steel plate attached to the riser by a continuous weld around the circumference of the riser to form a watertight connection. The plate shall have 2.5 feet of stone, gravel, or earth placed on it to prevent flotation. In either case, each side of the square base measurement shall be the riser diameter plus 24 inches.

Pipe outlet sediment traps shall be limited to a five (5) acre maximum drainage area. Pipe outlet sediment traps may be interchangeable in the field with stone outlet or riprap sediment traps provided that these sediment traps are constructed in accordance with the detail and specifications for that trap.

Select pipe diameter from the following table:

Minimum Sizes

Barrel Diameter[1] (in.)	Riser Diameter[1] (in.)	Maximum Drainage Area (ac.)
12	15	1
15	18	2
18	21	3
21	24	4
21	27	5

[1] Barrel diameter may be same size as riser diameter.

See details for Pipe Outlet Sediment Trap ST-I in Figure 5A.16 (1) and 5A.16 (2) on pages 5A.38 and 5A.39.

II. Grass Outlet Sediment Trap

A Grass Outlet Sediment Trap consists of a trap formed by excavating the earth to create a holding area. The trap has a discharge point over natural existing grass. The outlet crest width (feet) shall be equal to four (4) times the drainage area (acres) with a minimum width of four (4) feet. The outlet shall be free of any restrictions to flow. The outlet lip must remain undisturbed and level. The volume of this trap shall be computed at the elevation of the crest of the outlet. Grass outlet sediment traps shall be limited to a five (5) acre maximum drainage area.

See details for Grass Outlet Sediment Trap ST-II in Figure 5A.17 on page 5A.40.

III. Catch Basin Sediment Trap

A Catch Basin Sediment Trap consists of a basin formed by excavation on natural ground that discharges through an opening in a storm drain inlet structure. This opening can either be the inlet opening or a temporary opening made by omitting bricks or blocks in the inlet.

A yard drain inlet or an inlet in the median strip of a dual highway could use the inlet opening for the type outlet. The trap should be out of the roadway so as not to interfere with future compaction or construction. Placing the trap on the opposite side of the opening and diverting water from the roadway to the trap is one means of doing this. Catch basin sediment traps shall be limited to a three (3) acre maximum drainage area. The volume of this trap is measured at the elevation of the crest of the outlet (invert of the inlet opening).

See details for Catch Basin Sediment Trap ST-III in Figure 5A.18 on page 5A.41.

IV. Stone Outlet Sediment Trap

A Stone Outlet Sediment Trap consists of a trap formed by an embankment or excavation. The outlet of this trap is over a stone section placed on level ground. The minimum length (feet) of the outlet shall be equal to four (4) times the drainage area (acres).

Required storage shall be 3,600 cubic feet per acre of drainage area.

The outlet crest (top of stone in weir section) shall be level, at least one (1) foot below top of embankment and no more than one (1) foot above ground beneath the outlet. Stone used in the outlet shall be small riprap (4 in. x 8 in.). To provide more efficient trapping effect, a layer of filter cloth should be embedded one (1) foot back into the upstream face of the outlet stone or a one (1) foot thick layer of two (2) inch or finer aggregate shall be placed on the upstream face of the outlet.

Stone Outlet Sediment Traps may be interchangeable in the field with pipe or riprap outlet sediment traps provided they are constructed in accordance with the detail and specifications for those traps. Stone outlet sediment traps shall be limited to a five (5) acre maximum drainage area.

See details for Stone Outlet Sediment Trap ST-IV in Figure 5A.19 on page 5A.42.

V. Riprap Outlet Sediment Trap

A Riprap Outlet Sediment Trap consists of a trap formed by an excavation and embankment. The outlet for this trap shall be through a partially excavated channel lined with riprap. This outlet channel shall discharge onto a stabilized area or to a stable watercourse. The riprap outlet sediment trap may be used for drainage areas of up to a maximum of 15 acres.

Design Criteria for Riprap Outlet Sediment Trap

1. The total contributing drainage area (disturbed or undisturbed either on or off the developing property) shall not exceed 15 acres.
2. The storage needs for this trap shall be computed using 3600 cubic feet of required storage for each acre of drainage area. The storage volume provided can be figured by computing the volume of storage area available behind the outlet structure up to an elevation of one (1) foot below the level weir crest.
3. The maximum height of embankment shall not exceed five (5) feet.
4. The elevation of the top of any dike directing water to a riprap outlet sediment trap will equal or exceed the minimum elevation of the embankment along the entire length of this trap.

Riprap Outlet Sediment Trap ST-V
(for Stone Lined Channel)

Contributing Drainage Area (ac.)	Depth of Channel (a) (ft.)	Length of Weir (b) (ft.)
1	1.5	4.0
2	1.5	5.0
3	1.5	6.0
4	1.5	10.0
5	1.5	12.0
6	1.5	14.0
7	1.5	16.0
8	2.0	10.0
9	2.0	10.0
10	2.0	12.0
11	2.0	14.0
12	2.0	14.0
13	2.0	16.0
14	2.0	16.0
15	2.0	18.0

See details for Riprap Outlet Sediment Trap ST-V on Figures 5A.20(1) and 5A.20(2) on pages 5A.43 and 5A.44.

Optional Dewatering Methods

Optional dewatering devices may be designed for use with sediment traps. Included are two methods, which may be used. See Figure 5A.21 on page 5A.45 for details.

Figure 5A.16(1)
Pipe Outlet Sediment Trap: ST-I

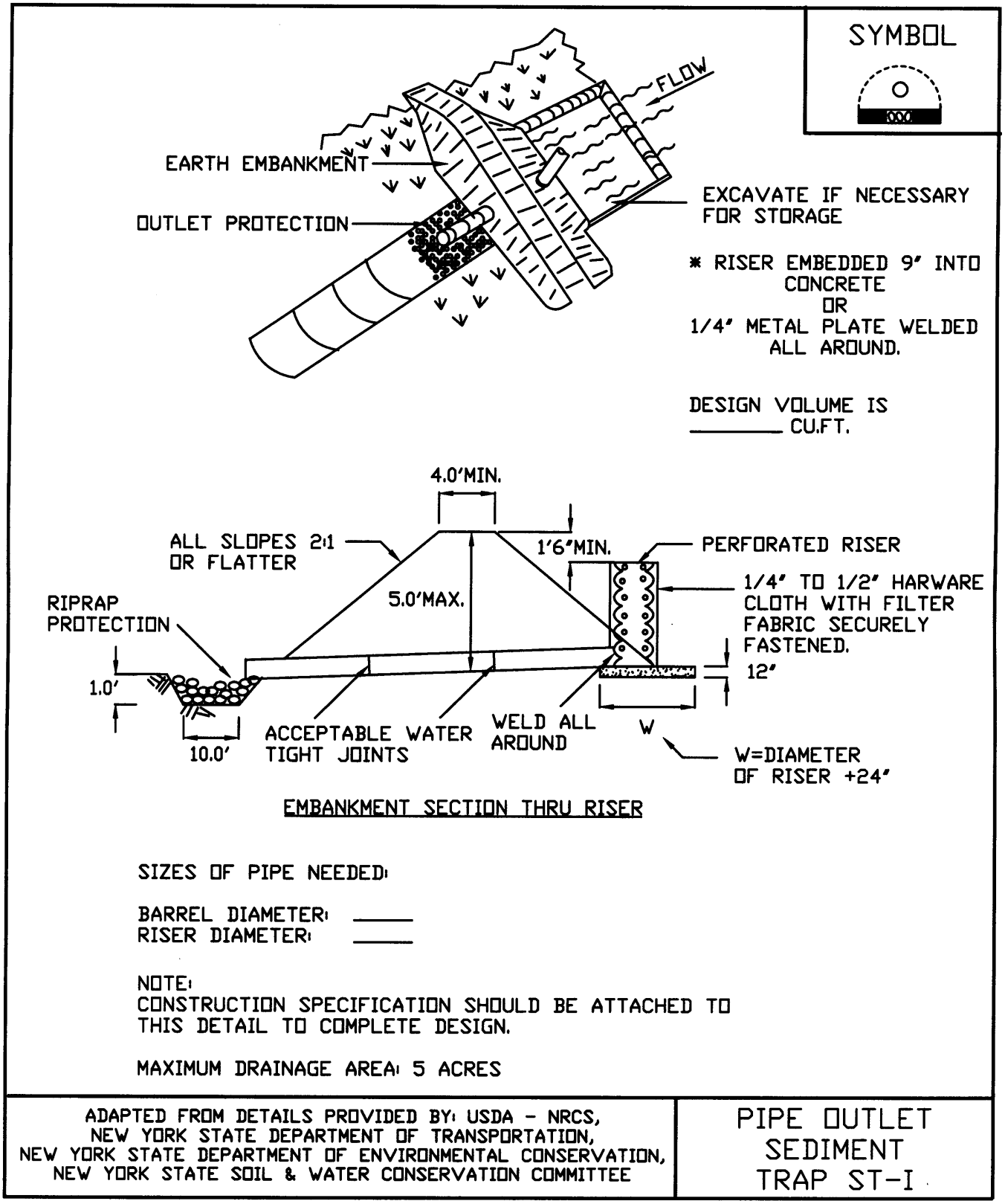


Figure 5A.16(2)
Pipe Outlet Sediment Trap: ST-I—Construction Specifications

SYMBOL

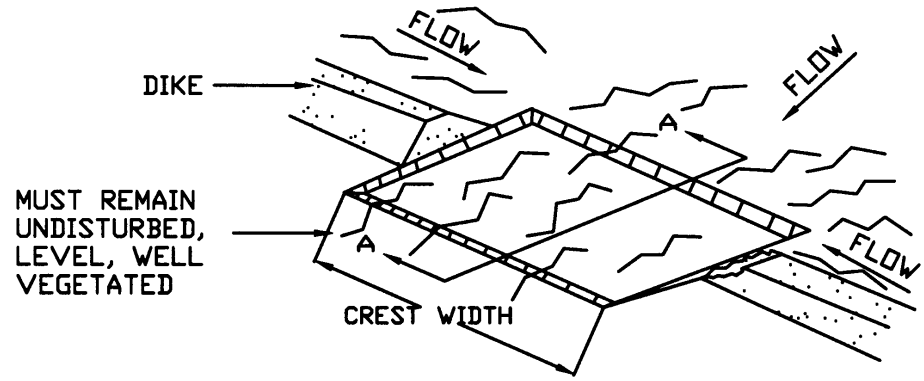
CONSTRUCTION SPECIFICATIONS

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE.
4. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
5. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
6. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
7. THE STRUCTURE SHALL BE REMOVED AND AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
8. ALL FILL SLOPES SHALL BE 2:1 OR FLATTER; CUT SLOPES 1:1 OR FLATTER.
9. ALL PIPE CONNECTIONS SHALL BE WATERTIGHT.
10. THE TOP 2/3 OF THE RISER SHALL BE PERFORATED WITH ONE (1) INCH DIAMETER HOLES OR SLITS SPACED SIX (6) INCHES VERTICALLY AND HORIZONTALLY AND PLACED IN THE CONCAVE PORTION OF PIPE. NO HOLES WILL BE ALLOWED WITHIN SIX (6) INCHES OF THE HORIZONTAL BARREL.
11. THE RISER SHALL BE WRAPPED WITH 1/4 TO 1/2 INCH HARDWARE CLOTH WIRE THEN WRAPPED WITH FILTER CLOTH (HAVING AN EQUIVALENT SIEVE SIZE OF 40-80). THE FILTER CLOTH SHALL EXTEND SIX (6) INCHES ABOVE THE HIGHEST HOLE AND SIX (6) INCHES BELOW THE LOWEST HOLE. WHERE ENDS OF THE FILTER CLOTH COME TOGETHER, THEY SHALL BE OVER-LAPPED, FOLDED AND STAPLED TO PREVENT BYPASS.
12. STRAPS OR CONNECTING BANDS SHALL BE USED TO HOLD THE FILTER CLOTH AND WIRE FABRIC IN PLACE. THEY SHALL BE PLACED AT THE TOP AND BOTTOM OF THE CLOTH.
13. FILL MATERIAL AROUND THE PIPE SPILLWAY SHALL BE HAND COMPACTED IN FOUR (4) INCH LAYERS. A MINIMUM OF TWO (2) FEET OF HAND COMPACTED BACKFILL SHALL BE PLACED OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
14. THE RISER SHALL BE ANCHORED WITH EITHER A CONCRETE BASE OR STEEL PLATE BASE TO PREVENT FLOTATION. FOR CONCRETE BASED THE DEPTH SHALL BE TWELVE (12) INCHES WITH THE RISER EMBEDDED NINE (9) INCHES. A 1/4 INCH MINIMUM THICKNESS STEEL PLATE SHALL BE ATTACHED TO THE RISER BY A CONTINUOUS WELD AROUND THE BOTTOM TO FORM A WATERTIGHT CONNECTION AND THEN PLACE TWO (2) FEET OF STONE, GRAVEL, OR TAMPED EARTH ON THE PLATE.

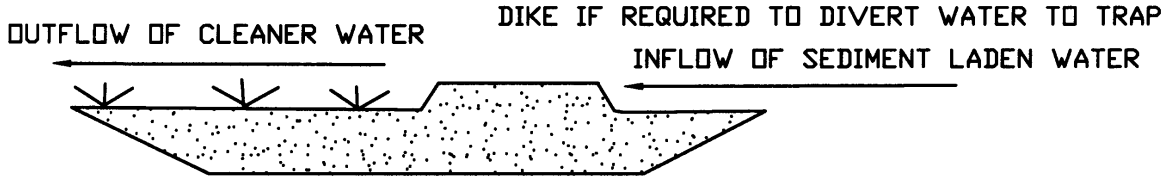
ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

PIPE OUTLET
SEDIMENT TRAP
ST-I

Figure 5A.17
Grass Outlet Sediment Trap: ST-II



SYMBOL



CREST WIDTH (FT)=4xDRAINAGE AREA (ACRES)

SECTION A - A
EXCAVATED GRASS OUTLET SEDIMENT TRAP

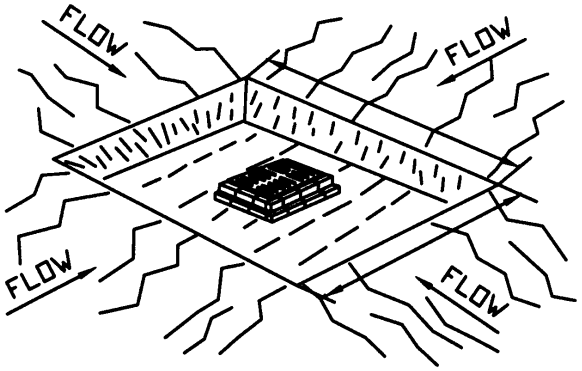
CONSTRUCTION SPECIFICATIONS

1. VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE AREA.
2. MINIMUM CREST WIDTH SHALL BE 4 x DRAINAGE AREA
3. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
4. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
5. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
6. THE SEDIMENT TRAP SHALL BE REMOVED AND AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
7. ALL CUT SLOPES SHALL BE 1:1 OR FLATTER.

MAXIMUM DRAINAGE AREA: 5 ACRES

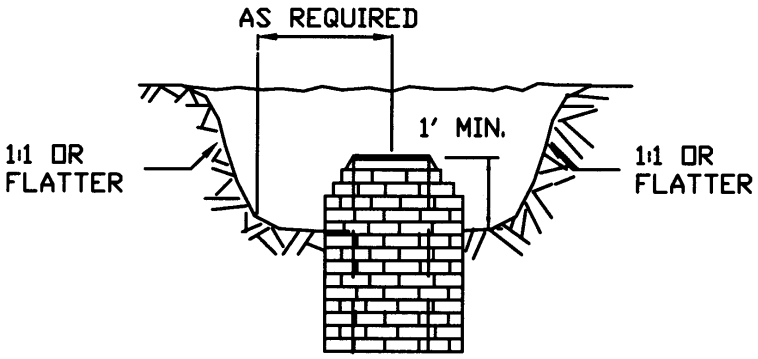
ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	GRASS OUTLET SEDIMENT TRAP ST-II

Figure 5A.18
Catch Basin Sediment Trap: ST-III



SYMBOL

YARD DRAIN



CROSS SECTION

CONSTRUCTION SPECIFICATIONS

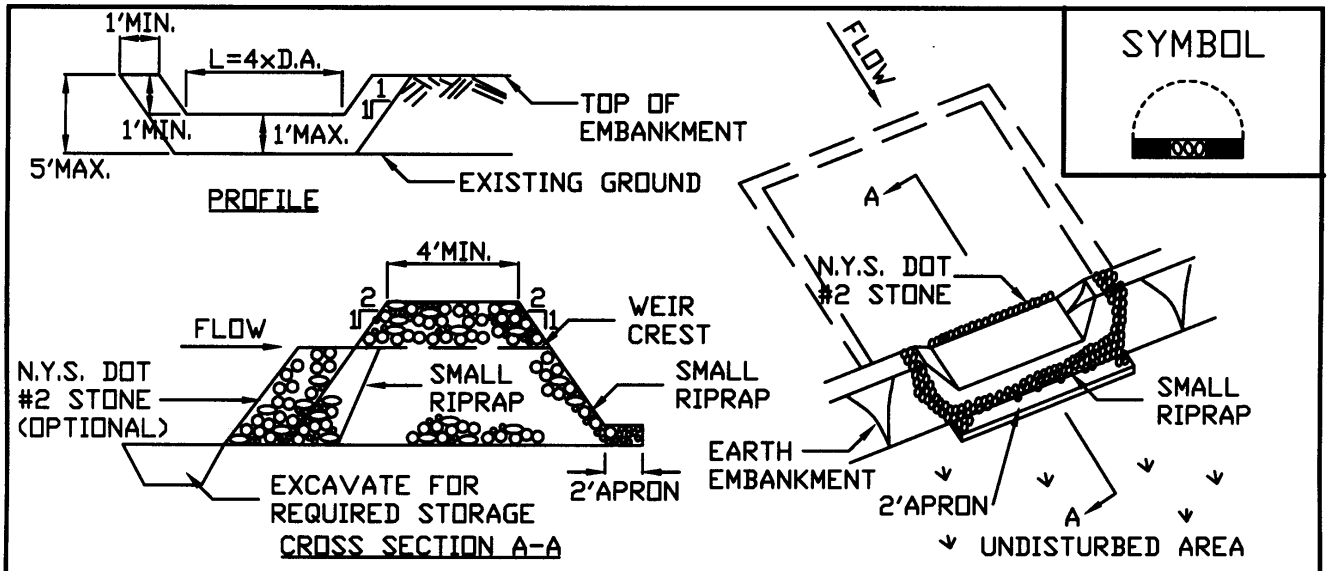
1. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
2. THE VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE.
3. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
5. THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE CONSTRUCTED DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
6. ALL CUT SLOPES SHALL BE 1:1 OR FLATTER.

MAXIMUM DRAINAGE AREA: 3 ACRES

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

CATCH BASIN
SEDIMENT TRAP
ST-III

Figure 5A.19
Stone Outlet Sediment Trap: ST-IV



OPTION: A ONE FOOT LAYER OF N.Y.S. DOT #2 STONE MAY BE PLACED ON THE UPSTREAM SIDE OF THE RIPRAP INPLACE OF THE EMBEDDED FILTER CLOTH.

CONSTRUCTION SPECIFICATIONS

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS AND OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER.
4. THE STONE USED IN THE OUTLET SHALL BE SMALL RIPRAP 4"-8" ALONG WITH A 1' THICKNESS OF 2" AGGREGATE PLACED ON THE UP-GRADE SIDE ON THE SMALL RIPRAP OR EMBEDDED FILTER CLOTH IN THE RIPRAP.
5. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. IT SHALL BE PLACED ON SITE AND STABILIZED.
6. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
7. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
8. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

MAXIMUM DRAINAGE AREA 5 ACRES

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STONE OUTLET SEDIMENT TRAP ST-IV

Figure 5A.20(1)
Riprap Outlet Sediment Trap: ST-V

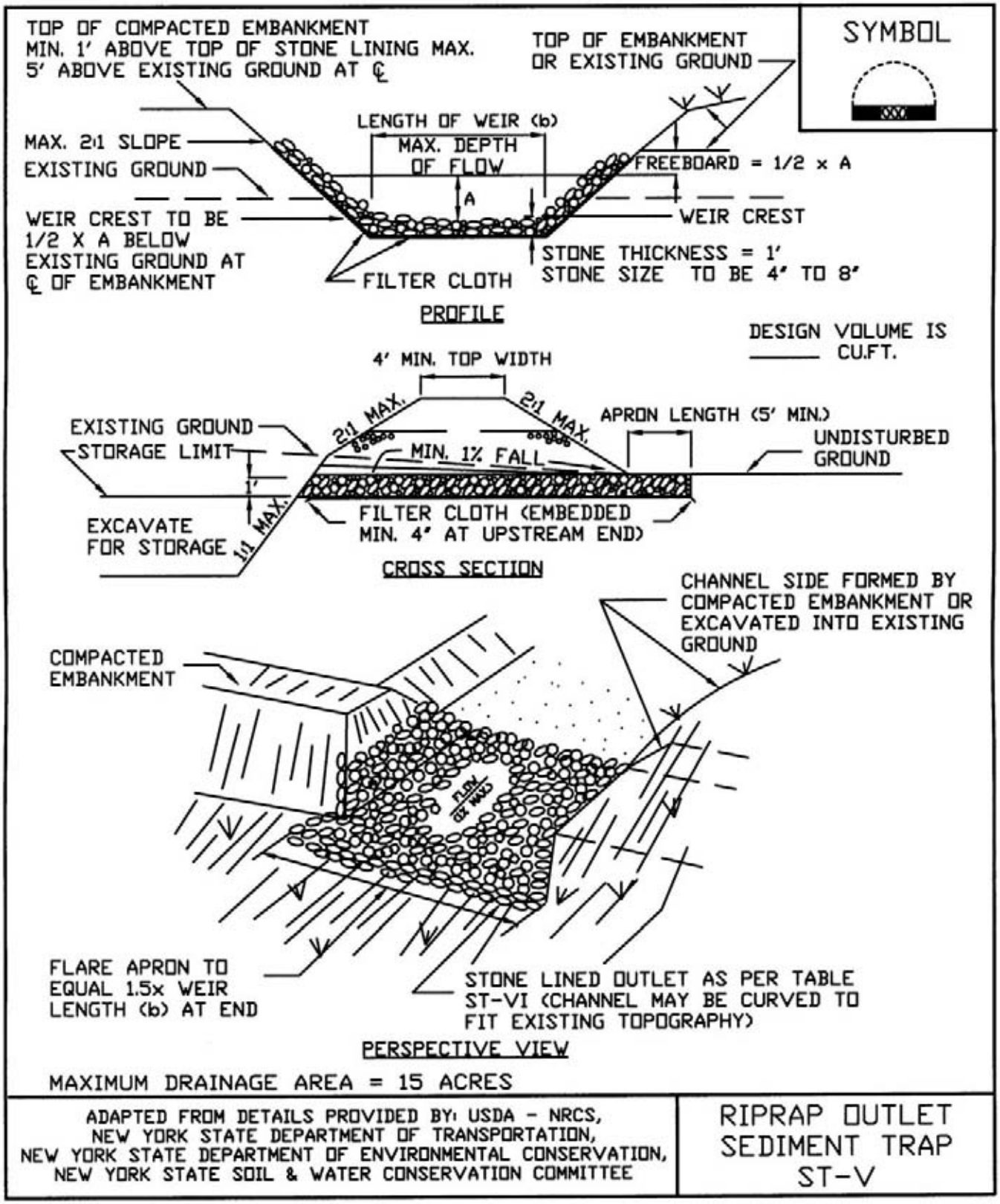


Figure 5A.202)
Riprap Outlet Sediment Trap: ST-V—Construction Specifications

SYMBOL

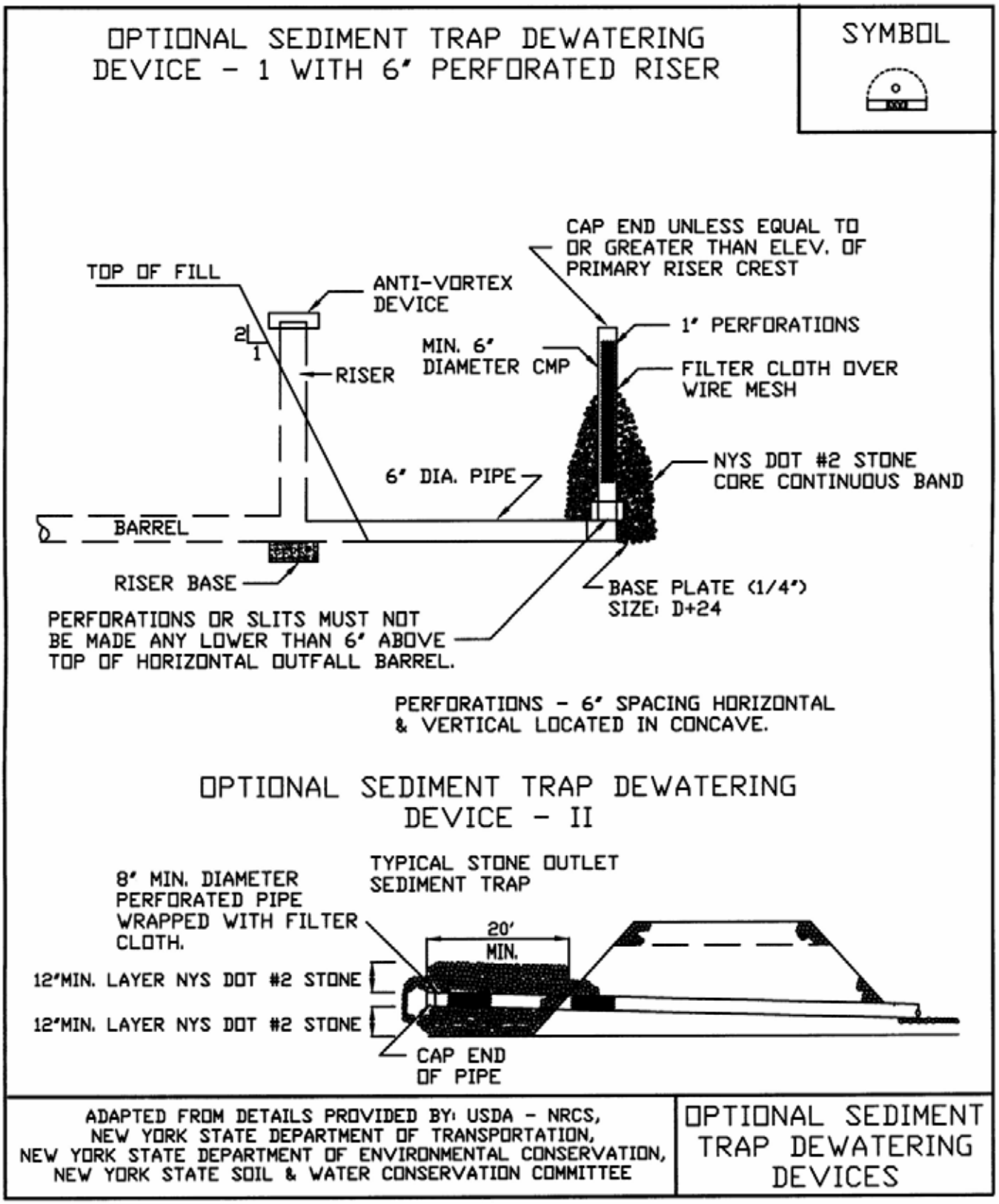
CONSTRUCTION SPECIFICATIONS

1. THE AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED. MAXIMUM HEIGHT OF OF EMBANKMENT SHALL BE FIVE (5) FEET, MEASURED AT CENTERLINE OF EMBANKMENT.
3. ALL FILL SLOPES SHALL BE 2:1 OR FLATTER, CUT SLOPES 1:1 OR FLATTER.
4. ELEVATION OF THE TOP OF ANY DIKE DIRECTING WATER INTO TRAP MUST EQUAL OR EXCEED THE HEIGHT OF EMBANKMENT.
5. STORAGE AREA PROVIDED SHALL BE FIGURED BY COMPUTING THE VOLUME AVAILABLE BEHIND THE OUTLET CHANNEL UP TO AN ELEVATION OF ONE (1) FOOT BELOW THE LEVEL WEIR CREST.
6. FILTER CLOTH SHALL BE PLACED OVER THE BOTTOM AND SIDES OF THE OUTLET CHANNEL PRIOR TO PLACEMENT OF STONE. SECTIONS OF FABRIC MUST OVERLAP AT LEAST ONE (1) FOOT WITH SECTION NEAREST THE ENTRANCE PLACED ON TOP. FABRIC SHALL BE EMBEDDED AT LEAST SIX (6) INCHES INTO EXISTING GROUND AT ENTRANCE OUTLET CHANNEL.
7. STONE USED IN THE OUTLET CHANNEL SHALL BE FOUR (4) TO EIGHT (8) INCH RIPRAP. TO PROVIDE A FILTERING EFFECT, A LAYER OF FILTER CLOTH SHALL BE EMBEDDED ONE (1) FOOT WITH SECTION NEAREST ENTRANCE PLACED ON TOP. FABRIC SHALL BE EMBEDDED AT LEAST SIX (6) INCHES INTO EXISTING GROUND AT ENTRANCE OF OUTLET CHANNEL.
8. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
9. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRED AS NEEDED.
10. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
11. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
12. DRAINAGE AREA FOR THIS PRACTICE IS LIMITED TO 15 ACRES OR LESS.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

RIPRAP OUTLET
SEDIMENT TRAP
ST-V

Figure 5A.21
Optional Sediment Trap Dewatering Devices



ATTACHMENT 3

NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN

ATTACHMENT 3

New York State Department of Health
Generic Community Air Monitoring Plan [1]

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

[1] Taken from Appendix 1A of the Draft DER-10 Technical Guidance for Site Investigation and Remediation, December 2002.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring

particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter ($\mu g/m^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 $\mu g/m^3$ above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

ATTACHMENT 4

DECLARATION OF CONDITIONS, COVENANTS, AND RESTRICTIONS

DECLARATION OF CONDITIONS, COVENANTS AND RESTRICTIONS

THIS DECLARATION OF CONDITIONS, COVENANTS AND RESTRICTIONS, made this 20th day of February, 1996, by Bethlehem Steel Corporation, a corporation duly formed and existing under the laws of the State of Delaware, authorized to do business in the State of New York, and having its principal place of business in the City of Bethlehem, Lehigh County, Pennsylvania, with a mailing address of 1170 Eighth Avenue, Bethlehem, Pennsylvania 18016-7699 (hereinafter "BSC"),

W I T N E S S E T H:

WHEREAS, BSC is the owner of certain noncontiguous lands adjacent to the eastern shore of Lake Erie situate partly in the City of Lackawanna, partly in the Town of Hamburg and partly in the Village of Blasdell, all in the County of Erie, State of New York, containing in the aggregate approximately 1,215 acres, and encompassing approximately 2.5 miles in an approximate north-south direction and approximately 1.4 miles in an approximate east-west direction, which were formerly part of the site of an integrated steel plant, and a portion of which lands is described and delineated more particularly in SCHEDULE B herein (said portion shall be hereinafter referred to as the "Premises"); and

WHEREAS, the history of the Premises is described more fully in SCHEDULE A herein; and

WHEREAS, certain governmental agencies and BSC have conducted environmental investigations at and near the Premises, the scope, result and impact of each of which are described more fully in SCHEDULE A herein; and

WHEREAS, BSC seeks to impose conditions, covenants and restrictions on the Premises for the purpose of promoting, benefitting, preserving and protecting the health and safety of the public and the environment all as related to the foregoing.

NOW, THEREFORE, (i) BSC, on behalf of itself, its successors and assigns, hereby declares and (ii) each and every person or entity who shall be an owner of the Premises or any part thereof, hereby covenants and agrees on behalf of itself, its successors and assigns, that the Premises or any part thereof shall be held, transferred, sold, conveyed, occupied and developed subject to the following conditions, covenants and restrictions:

1. The Premises or any part thereof shall be limited to industrial use only, which shall include manufacturing, assembling, warehousing, and related railroad, port and shipping activities, together with office space and other facilities including laboratories incidental to such uses, but incidental uses such as day care centers, nursery schools or other facilities that are designed or intended to be primarily for use or occupancy by multiple numbers of persons under the age of eighteen (18) years shall not be permitted.

2. No wells for the extraction or use of water from beneath the surface of the Premises or any part thereof shall be installed, built, permitted or utilized on the Premises or any part thereof for any purpose whatsoever; provided, however, that BSC may install, use, operate and maintain monitoring wells and treatment wells, including the extraction and treatment of water therefrom, solely for the purpose of monitoring, treating or remediating such water; and provided, further, that any other owner of the Premises or any

part thereof may install, use, operate and maintain monitoring wells and treatment wells, including the extraction and treatment of water therefrom, on the part of the Premises so owned by such owner, solely for the purpose of monitoring, treating or remediating such water.

3. Any activity or use not specifically permitted hereby or any activity prohibited pursuant hereto shall be forbidden.

A. Purpose.

It is the intent of BSC by means of said conditions, covenants and restrictions to promote, benefit, preserve and protect the health and safety of the public and the environment by preventing any activity or use not specifically permitted above or any activity prohibited pursuant to paragraphs 1 and 2 above.

B. Conditions, Covenants and Restrictions to Run with the Premises.

Said conditions, covenants and restrictions shall run with the Premises and every part thereof and shall bind all owners and occupiers of the Premises or any part thereof, and their respective successors and assigns; all parties claiming by, through, or under them or any of them shall be taken to hold, agree and covenant with all owners of the Premises or any part thereof, and their respective successors and assigns and each of them, to conform to and observe said conditions, covenants and restrictions.

C. Enforceability.

Said conditions, covenants and restrictions shall inure to the benefit of and be enforceable by BSC and by each and every person or entity, including BSC,

who shall be an owner of the Premises or any part thereof, and their respective successors and assigns, and shall also benefit BSC, its successors and assigns, for so long as BSC shall (i) own any property either adjacent or proximal to the Premises or any part thereof or (ii) be responsible under any law, ordinance, rule or regulation for the presence of hazardous wastes or hazardous constituents or both upon or within the Premises or any part thereof or in said property adjacent or proximal to the Premises or any part thereof but said conditions, covenants and restrictions shall not give rise, by implication or otherwise, to a reciprocal condition, covenant or restriction burdening or binding upon the other lands or any part thereof of BSC benefitted hereby, by actions at law or by suits in equity. As it may be impossible to measure monetarily the damages which may accrue to the beneficiaries hereunder by reason of a violation of this Declaration, any beneficiary hereunder shall be entitled to relief by way of injunction or specific performance, as well as any other relief available at law or in equity, to enforce the provisions hereof.

The failure of any beneficiary hereunder to enforce any provision of this Declaration shall in no event be construed as a waiver of the right of that beneficiary or any other beneficiary hereunder to do so thereafter, as to the same or a similar violation occurring prior or subsequent thereto. No liability shall attach to BSC or any subsidiary or other affiliate of BSC (or any officer, director, employee, member, agent, committee or committee member of any of them) or to any other beneficiary hereunder

(excepting, however, the subject owner in breach) for failure to enforce the provisions of this Declaration.

If BSC or any other beneficiary hereunder successfully brings an action to extinguish a breach or otherwise enforce the provisions of this Declaration, the costs of such action, including legal fees, shall become a binding, personal obligation of the owner in breach.

D. Amendments and Termination.

Any amendment or termination of this Declaration affecting any part of the Premises shall require the written consent of all owners of the Premises or any part thereof, which consent shall not be unreasonably withheld, and of BSC, or its successors or assigns, whose consent may be withheld in its sole discretion.

Any amendment or termination of this Declaration shall not become effective until the instrument evidencing such change has been duly recorded in the Erie County Clerk's Office.

Neither this Declaration nor any amendment to this Declaration shall be interpreted as permitting any action or thing prohibited by the applicable laws, ordinances, rules or regulations of any governmental authority having jurisdiction over the part of the Premises affected or by specific restrictions imposed by any other instrument relating to the Premises or to such part of the Premises.

No change of conditions or circumstances shall operate to amend this Declaration, and this Declaration may be amended only in the manner provided herein.

The determination by any court of competent jurisdiction that any provision of this Declaration is unenforceable invalid or void shall not affect the enforceability or validity of any other provision hereof.

IN WITNESS WHEREOF, BSC has executed this Declaration as of the day and year first above written.

ATTEST:

BETHLEHEM STEEL CORPORATION,
by

Assistant Secretary

A.E. Moffitt, Jr.
Vice President

COMMONWEALTH OF PENNSYLVANIA)
) SS.:
COUNTY OF LEHIGH)

On the 20th day of February, 1996, before me personally came A. E. Moffitt, Jr., to me known, who, being by me duly sworn, did depose and say that he resides at 3850 Brandeis Avenue, Bethlehem, Pennsylvania 18017; that he is a Vice President of Bethlehem Steel Corporation, the corporation described in and which executed the above instrument; and that he signed his name thereto by authority of the By-laws of said corporation.

Dorothy A. Midash
Notary Public

NOTARIAL SEAL
Dorothy A. Midash, Notary Public
City of Bethlehem, Lehigh County, Pa.
My Commission Expires Dec. 7, 1996

SCHEDULE A
HISTORY OF THE PREMISES

The Premises were formerly part of the site (the "Site") of an integrated steel plant for iron and steel production, which plant consisted of blast furnaces, coke batteries, basic oxygen and open hearth steelmaking furnaces, a sinter plant, rolling mills, and finishing mills (includes a galvanizing line). Iron and steel production ceased in October 1983. Thus, as of the date hereof, the only operations remaining in service are coke batteries that are located on the Premises and a galvanizing line that is located on lands of BSC other than the Premises. The approximate western seven-tenths (7/10) of the Premises (the "Fill Area") is "man-made" land, having been filled by the deposition of various constituents hereinafter described to an average elevation of about 30 feet above Lake Erie mean water level.

A Resource Conservation and Recovery Act ("RCRA") Facility Assessment ("RFA") conducted in 1988 by the U.S. Environmental Protection Agency (the "EPA") and National Enforcement Investigation Center ("NEIC") identified certain solid waste management units ("SWMUs") some of which are located within the Premises. Said SWMUs may have received various wastes or substances, and several water courses, portions or all of which may be on the Premises or on lands adjacent to the Premises, may have been impacted by releases from SWMUs. Pursuant to Section 3008(h) of RCRA, BSC and the EPA entered into an Administrative Order on Consent dated August 13, 1990 ("AOC"), which directed BSC to perform a phased site-wide RCRA

Facility Investigation to determine the nature and extent of any releases of hazardous wastes or hazardous constituents or both from SWMUs into soils, groundwater, sediment, and surface water at or near the Premises.

Documentary information with respect to the types and locations of SWMUs, and any areas of the Premises (or adjacent to the Premises) that may have been impacted by releases of hazardous wastes or hazardous constituents or both from SWMUs, can currently be obtained from documents submitted to (1) the EPA Region II New York office (currently at Hazardous Waste Facilities Branch, Air and Waste Management Division, U.S. Environmental Protection Agency, Region II, 22nd Floor, 240 Broadway, New York, New York 10007-1866), and (2) the New York State Department of Environmental Conservation (the "DEC") at its Albany, New York office (currently at 50 Wolf Road, Albany, New York 12233), and its Region 9 office at Buffalo, New York (currently at 270 Michigan Avenue, Buffalo, New York 14208-2999). Such documentary information (the "Documentary Information") includes but is not limited to the following:

A. Letter from BSC to EPA Region II, dated September 25, 1986, together with attachments, concerning Response to Information Request Pursuant to RCRA Section 3007, Bethlehem Steel Corporation: Lackawanna, New York;

B. United States Environmental Protection Agency Region II, Administrative Order on Consent, Docket No. II RCRA-90-3008(h)-0201, In the Matter of Bethlehem Steel Corporation, Lackawanna, New York 14218-0310, EPA I.D. No. NYD002134880, dated August 13, 1990, together with attachments;

C. Draft Final Report Phased Site Investigation, Bethlehem Steel Corporation, Lackawanna, New York, Phase I, dated August 14, 1992; and

D. Draft Final Report Phased Site Investigation, Bethlehem Steel Corporation, Lackawanna, New York, Phase II-A, dated June 29, 1993, together with appendices.

BSC records and aerial photographs dating from 1938 to the present indicate that the Fill Area (as more specifically identified in the Documentary Information, covering the westward advancement of the Lake Erie shoreline) was used for the disposal from the Premises and from certain other lands located in Erie County, New York (some of which lands are currently owned by BSC and others of which are formerly of BSC or its predecessors in interest that were sold prior to the date hereof), of some or all of (i) excess blast furnace and steelmaking slag, (ii) waste materials, including sludges from wastewater treatment plants, other sludges, dusts and liquids from steel finishing, steel forming, steelmaking, ironmaking and coke-making operations, and (iii) dredge materials from Smokes Creek, which creek is located south of the Premises. The Fill Area has also been the site of oil tanks, coal storage piles, and disposal areas for general debris from the Premises, the Site, said other lands of BSC, and said former lands of BSC. Disposal activities in the Fill Area have ceased.

Further information with respect to past activities at the Premises, current activities, previous environmental investigations, current environmental investigations, groundwater quality, settings and classifications of identified SWMUs, areas of possible environmental concern, topography, and geology, hydrogeology, human health

and environmental impacts (with respect to the Premises and regionally), can be obtained from the Documentary Information and other documents submitted to the EPA and the DEC at the above-identified locations.

SCHEDULE B
LEGAL DESCRIPTION OF THE PREMISES

All that tract of land situate in the City of Lackawanna, Erie County, New York, being parts of Lots 18, 19, 22, 23 and 25 of the Ogden Gore Tract, part of Lot 24, Township 10, Range 8, of the Buffalo Creek Reservation, and lands now or formerly under the waters of Lake Erie and more particularly bounded and described as follows:

BEGINNING on the Buffalo Harbor Line dated August 17, 1903 at the northwesterly corner of the tract of land that was remised, released and quitclaimed by said Bethlehem Steel Corporation to Gateway Trade Center Inc. by Indenture dated December 31, 1985, and recorded on December 31, 1985 in the Erie County Clerk's Office in Liber 9530 of Deeds, at page 385, and which Indenture was, in part, corrected by Corrective Indenture between said Bethlehem Steel Corporation and said Gateway Trade Center Inc. dated May 1, 1995, and recorded on May 16, 1995 in said Office in Liber 10886 of Deeds, at page 1064; thence, along said last-mentioned tract of land, the following fourteen (14) courses and distances: (1) South eighteen degrees forty-four minutes fifty-three seconds East (S. 18° 44′ 53″ E.) six hundred twenty-three and fifty-six one-hundredths (623.56) feet, (2) South thirty-four degrees thirty-three minutes zero seconds East (S. 34″ 33′ 00″ E.) two hundred and no one-hundredths (200.00) feet, (3) South twenty-six degrees eighteen minutes fifty-five seconds East (S. 26° 18′ 55″ E.) five hundred and no one-hundredths (500.00) feet, (4) South nineteen degrees six minutes forty seconds East (S. 19″ 06′ 40″ E.) one thousand seventy-four and twenty-nine one-hundredths (1074.29) feet, (5) South twenty-eight degrees three minutes eighteen seconds East (S. 28° 03′ 18″ E.) two hundred forty-two and forty-four one-hundredths (242.44) feet, (6) South eighteen degrees thirty-eight minutes fifty seconds East (S. 18° 38′ 50″ E.) one thousand ten and ninety-five one-hundredths (1010.95) feet, (7) North seventy-one degrees twenty minutes fifty-one seconds East (N. 71° 20′ 51″ E.) ninety and forty-two one-hundredths (90.42) feet, (8) South eighteen degrees forty-nine minutes twenty seconds East (S. 18° 49′ 20″ E.) one hundred fifty-eight and sixty-one one-hundredths (158.61) feet, (9) South eighty degrees fifty-five minutes ten seconds East (S. 80° 55′ 10″ E.) forty-five and fourteen one-hundredths (45.14) feet, (10) South eighteen degrees four minutes forty-five seconds East (S. 18° 04′ 45″ E.) fifty-two and thirteen one-hundredths (52.13) feet, (11) North seventy-one degrees seven minutes twenty-three seconds East (N. 71° 07′ 23″ E.) one hundred two and fifty-nine one-hundredths (102.59) feet, (12) South eighteen degrees forty-one minutes forty seconds East (S. 18° 41′ 40″ E.) sixty-three and no one-hundredths (63.00) feet, (13) South

seventy-one degrees seven minutes twenty-three seconds West (S. 71° 07′ 23″ W.) two hundred forty and sixty-two one-hundredths (240.62) feet, and (14) South eighteen degrees thirty-eight minutes fifty seconds East (S. 18° 38′ 50″ E.) six hundred sixty-eight and thirteen one-hundredths (668.13) feet; thence, along other lands of said Bethlehem Steel Corporation, the following seven (7) courses and distances: (1) South four degrees forty minutes fifty-one seconds East (S. 04° 40′ 51″ E.) seven hundred eighty-seven and seventy-two one-hundredths (787.72) feet, (2) South seventy-one degrees twenty-three minutes thirty-five seconds West (S. 71° 23′ 35″ W.) two hundred and no one-hundredths (200.00) feet, (3) South eighteen degrees thirty-six minutes twenty-five seconds East (S. 18° 36′ 25″ E.) eight hundred fifty and no one-hundredths (850.00) feet, (4) South seventy-one degrees twenty-three minutes thirty-five seconds West (S. 71° 23′ 35″ W.) one thousand one hundred and no one-hundredths (1100.00) feet, (5) North eighteen degrees thirty-six minutes twenty-five seconds West (N. 18° 36′ 25″ W.) one thousand four hundred and no one-hundredths (1400.00) feet, (6) North seventy-one degrees twenty-three minutes thirty-five seconds East (N. 71° 23′ 35″ E.) thirty and no one-hundredths (30.00) feet, and (7) North eighteen degrees thirty-six minutes twenty-five seconds West (N. 18° 36′ 25″ W.) four thousand six hundred fifty and no one-hundredths (4650.00) feet to the southerly line of lands reputedly owned by The People of the State of New York; thence, along said last-mentioned lands, North seventy-one degrees twenty-three minutes thirty-five seconds East (N. 71° 23′ 35″ E.) seven hundred thirty-eight and no one-hundredths (738.00) feet to a westerly line of lands reputedly owned by The United States of America; thence, along said last-mentioned lands, the following two (2) courses and distances: (1) South thirty-five degrees fifty-seven minutes twenty-five seconds East (S. 35° 57′ 25″ E.) thirty-five and eighty-three one-hundredths (35.83) feet and (2) North fifty-four degrees two minutes thirty-five seconds East (N. 54° 02′ 35″ E.) two hundred and no one-hundredths (200.00) feet to the above-mentioned Buffalo Harbor Line dated August 17, 1903; thence, along said Buffalo Harbor Line, North fifty degrees one minute forty-five seconds East (N. 50° 01′ 45″ E.) three hundred seventy-nine and fifty-four one-hundredths (379.54) feet to the place of beginning; CONTAINING one hundred ninety-one and nine hundred ninety-three one-thousandths (191.993) acres, more or less.