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October 31, 2016

Brad Johnston
nexAir, LLC.
5808 Old Millington Road,
Millington, Tennessee 38053

Re: Stormwater Pollution Prevention Plan for 5808 Old Millington Road, Millington, Tennessee

Dear Brad:

Enclosed please find a hard copy and CD containing an electronic copy of final version of the Stormwater Pollution Prevention Plan (SWPPP), completed by Rachael Bailey of EnSafe for the nexAir Millington facility. The hard copy of the previous SWPPP which you provided for reference during the site visit is also enclosed.

We appreciate the opportunity to complete this work for nexAir. Please contact me at (901) 937-4344 or via email at rsbailey@ensafe.com if you have questions concerning this report or need further environmental health and safety assistance.

Sincerely,

EnSafe Inc.

By: Rachael Bailey
Project Manager
Compliance Services

Enclosures

NEXAIR, LLC
STORM WATER POLLUTION PREVENTION PLAN

NEXAIR, LLC
5808 OLD MILLINGTON ROAD
MILLINGTON, TENNESSEE 38053

EnSafe Project Number:
0888803701

Prepared for:

nexAir, LLC
5808 Old Millington Road
Millington, Tennessee 38053

Prepared by:

EnSafe Inc.
5724 Summer Trees Drive
Memphis, Tennessee 38134
(901) 372-7962
(800) 588-7962
www.ensafe.com

October 2016

SWPP PLAN CERTIFICATION

This Storm Water Pollution Prevention Plan (SWPPP) was prepared for nexAir, LLC in Millington, Tennessee, in accordance with best management practices and in accordance with Title 40 Code of Federal Regulations Part 122.26 and the Tennessee Storm Water Multi-Sector General Permit for Industrial Activities, as appropriate. It has the full approval of management at a level of authority to commit the necessary resources to ensure full SWPPP implementation. This SWPPP will be implemented as described herein, and will be reviewed and evaluated annually.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the site, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature	Date
Name	Title

NON-STORM WATER CERTIFICATION

EPA MSGP 2015 5.2.3.4: ***Non-Stormwater Discharges.*** You must document that you have evaluated for the presence of unauthorized non-storm-water discharges. Documentation of your evaluation must include:

- The date of any evaluation
- A description of the evaluation criteria used
- A list of the outfalls or onsite drainage points that were directly observed during the evaluation
- The different types of non-stormwater discharge(s) and source locations
- The action(s) taken, such as a list of control measures used to eliminate unauthorized discharge(s), or documentation that a separate National Pollutant Discharge Elimination System (NPDES) permit was obtained. For example, a floor drain was sealed, a sink drain was re-routed to sanitary, or a NPDES permit application was submitted for an unauthorized cooling water discharge.

I certify under penalty of law that nexAir, LLC has been evaluated for the presence of non-storm water discharges. This evaluation was performed through repeated observations of nexAir, LLC outdoor storage and work areas during periods of dry weather. I certify that, to the best of my knowledge, no non-storm water discharges exist at the facility as of this date. A Non-Storm Water Discharge Assessment and Certification (Appendix E) must be included in the Storm Water Pollution Prevention Plan and must be performed when non-storm water is observed during **monthly** facility inspections.

Signature of Responsible nexAir, LLC Official

Date

Name of Responsible nexAir, LLC Official

Record of SWPPP Review Amendments nexAir, LLC — Millington, Tennessee Plant				
Date	**Reviewer**	**Section**	**Amendments**	**Responsible Party Initials**
10/2016	EnSafe	Entire Plan	Initial Plan	

Table of Contents

Tables

Appendices

1.0 INTRODUCTION

This nexAir, LLC (nexAir) Storm Water Pollution Prevention Plan (SWPPP) has been prepared with the goal of improving water quality by preventing and/or reducing pollutants contained in storm water discharges. Meeting this goal can be a difficult challenge for many reasons. For example, the original sources of pollutants transported in storm water can be diffused or spread out over a wide area. Small oil and grease spills at hundreds of different activities within a single facility can collectively represent a major pollution problem. In addition, the nature of storm water is such that the amount of pollutants that enter the receiving waters will vary in accordance with the frequency, intensity, and duration of rainfall and the nature of the drainage patterns.

The pollution prevention approach in this SWPPP focuses on three major objectives:

- Identifying sources of pollution associated with industrial activities that are potentially affecting the quality of storm water discharges from the facility.

- Describing and ensuring implementation of practices to minimize and control pollutants associated with industrial activities that are entering storm water discharges from the facility.

- Ensuring compliance with the terms and conditions of the facility's National Pollutant Discharge Elimination System (NPDES) permit.

This SWPPP addresses areas at the facility where storm water discharges exposed to source materials can be practicably prevented or eliminated and identifies potential sources of pollution that may be reasonably expected to affect the quality of storm water discharges.

This SWPPP describes the implementation of best management practices (BMPs) at the facility to eliminate or reduce the amount of pollutants in storm water runoff from industrial activity areas to the maximum extent practicable (MEP). BMPs include both structural and nonstructural (operational) practices. Structural practices include secondary containment basins, storm water diversionary curbing, drain plugs, and similar items constructed or installed to eliminate or reduce the amounts of pollutants in storm water runoff. Nonstructural (operational) practices are also referred to as source controls and include standard operating procedures, schedules of activities, prohibitions on practices, and other management actions that are intended to eliminate or reduce the amount of pollutants in storm water runoff.

1.1 Regulatory Drivers

40 CFR 122.26(b)(14): ***Stormwater discharge associated with industrial activity.*** Means the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under this part. For the categories of industries identified in this section, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product, or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots, as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are federally-, state-, or municipally-owned or operated that meet the description of the facilities listed in paragraphs (b)(14)(i) through (xi) of this section) include those facilities designated under the provisions of paragraph (a)(1)(v) of this section.

nexAir has the potential to discharge storm water associated with industrial activity as defined in the United States Environmental Protection Agency (U.S. EPA) NPDES program established pursuant to the Federal Water Pollution Control Act, as amended by the Clean Water Act (33 U.S.C. 1251 et seq.), and codified in 40 Code of Federal Regulations (CFR) Part 122. Tennessee is a delegated state with NPDES permitting authority. The Tennessee Department of Environment and Conservation (TDEC) Tennessee Water Quality Control Act (T.C.A. 69-3-101) administers the state's NPDES program.

This SWPPP is written in accordance with the regulations governing the NPDES and the Tennessee Storm Water Multi-Sector General Permit for Industrial Activities (TMSP) for operations of facilities discharging storm water associated with industrial activity (TNR05000). nexAir is a manufacturer of industrial gases, as defined by Standard Industrial Classification (SIC) Code 2813 and is covered under Sector C of the TMSP TNR050000 (Appendix A). Once coverage under the TMSP is issued, nexAir must maintain a copy of the facility's Notice of Coverage with this SWPPP. Table 1-1 summarizes the permit requirements.

Table 1-1
Permitted Storm Water Discharges

Discharges Covered	Permit No.	Effective Permit Date	Permit Expiration Date	Permit Required Activities	Reporting Required
Storm Water Associated with Industrial Activity					
Industrial Activities associated with SIC Code 2813	Sector C of TNR050000	04/15/2015	04/14/2020	Annual analytical monitoring of ammonia, total recoverable aluminum, copper, iron, magnesium, ammonia, and nitrate plus nitrite nitrogen; monthly facility inspections; quarterly visual examinations; annual compliance evaluation	Quarterly visual examination; annual compliance evaluation
Non-Storm Water Discharges					
There are no permitted non-storm water discharges at this facility.					

Note:
SIC = Standard Industrial Classification

1.2 Storm Water Pollution Prevention Plan Requirements

U.S. EPA MSGP 2015 5.0: ***Preparedness Prevention and Contingency Plan Requirements.*** You must prepare a SWPPP for your facility before submitting your Notice of Intent (NOI) for permit coverage. If you prepared a SWPPP for coverage under a previous version of this NPDES permit, you must review and update the SWPPP to implement all provisions of this permit prior to submitting your NOI. The SWPPP does not contain effluent limitations; such limitations are contained in Part 2, 8, and 9 of the permit. The SWPPP is intended to document the selection design and installation of control measures to meet the permit's effluent limits. As distinct from the SWPPP the additional documentation requirements (see Part 5.5) are intended to document the implementation (including inspection, maintenance, monitoring, and corrective action) of the permit requirements.

The TMSP, located in Appendix A, requires nexAir to develop and implement a SWPPP. In general, this SWPPP follows the sequence of the regulatory requirements for SWPPPs outlined in 40 CFR 122.26, the U.S. EPA Multi-sector General Permit (U.S. EPA 2015), and TNR050000. The SWPPP discusses the facility's conformance to the applicable regulatory requirements of that section. In general, the federal regulations are cited at the beginning of each appropriate section. If state regulations or individual permits are different from federal requirements, they are discussed in the applicable section.

1.3 Pollution Prevention Team

U.S. EPA MSGP 2015 5.2.1: ***Stormwater Pollution Prevention Team.*** You must identify the staff members (by name or title) that comprise the facility's stormwater pollution prevention team as well as their individual responsibilities. Your stormwater pollution prevention team is responsible overseeing development of the SWPPP, any modifications to it, and for implementing and maintaining control measures and taking corrective actions where required. Each member of the stormwater pollution prevention team must have ready access to either an electronic or paper copy of applicable portions of the permit, the most updated copy of your SWPPP, and other relevant documents or information that must be kept with the SWPPP.

It is required that each SWPPP identify a specific individual(s) within the organization as a member of the Storm Water Pollution Prevention Team (SWPPT), organized to implement an effective storm water management program.

The SWPPT is responsible for developing and implementing the storm water management controls that will minimize the discharge of pollutants to the environment. The SWPPT has the overall responsibility for the program and for instituting revisions when necessary. The responsibility for storm water pollution prevention for the site lies with nexAir's Plant Manager, Brad Johnston. The Plant Manager, or trained designee, directs the efforts of the SWPPT to ensure the actions required by the SWPPP will be implemented. Table 1-2 lists the lead members of the SWPPT and their responsibilities are presented in Table 1-3.

Table 1-2
Storm Water Pollution Prevention Team

Storm Water Pollution Prevention Team Members	Phone Number
Brad Johnston, Plant Manager	24 Hour (901) 326-0198
Eugene Stepp, Plant Operator	24 Hour (901) 605-3144
Darryl Bledsoe, Plant Operator	24 Hour (901) 268-6490

Table 1-3
Responsibilities of SWPPT Members

SWPPT Member	Duties
SWPPT Leader	• Implement this SWPPP at the facility. • Ensure compliance with the facility's NPDES storm water discharge permit and this SWPPP. • Certify this SWPPP and approve revisions based upon annual reviews and evaluations. • Serve as the chairperson of the SWPPT. • Coordinate with the SWPPT members to verify compliance with NPDES permit conditions and SWPPP requirements. • Coordinate with the SWPPT members to verify that qualified personnel conduct reviews and evaluations at appropriate intervals as specified in this SWPPP. • Verify the adequacy of SWPPT member response actions for spills, leaks, or other discharges addressed by this SWPPP. • Verify that SWPPT members use proper records maintenance and retention practices within their area of responsibility as required by this SWPPP. • Monitor the activities of facility personnel on a random basis as needed to assure compliance with SWPPP implementation and operating requirements. • Coordinate the annual compliance evaluation and revision of this SWPPP based upon SWPPT member recommendations. • Review the annual compliance evaluation of this SWPPP. Annual updates must address all incidents of noncompliance. If there are no incidents of noncompliance during a review period, a certification statement that the site is in compliance shall be included in the review. • Prepare and forward to SWPPT members a report summarizing the results of each annual review and evaluation. • Assure proper implementation of a storm water monitoring program in accordance with the site's NPDES permit. • Review plans and drawings related to industrial facilities for new construction or renovation for erosion control measures and other recommended BMPs, to determine if a revision to this SWPPP is required. • Implement modifications required to achieve compliance with this SWPPP to the extent possible after a change in design, construction operations, or maintenance at the facility. • Provide technical guidance for training in storm water pollution prevention. • Identify and coordinate the number and types of personnel requiring storm water pollution prevention training. Assure that new personnel are trained within three months from the initial date of personnel assuming responsibilities.

Table 1-3
Responsibilities of SWPPT Members

SWPPT Member	Duties
SWPPT Members	• Implement the SWPPP requirements within designated area of responsibility. • Ensure compliance with this SWPPP within designated area of responsibility. • Perform or direct qualified implementing personnel to complete reviews and evaluations as required by this SWPPP within designated area of responsibility. • Oversee implementing personnel to ensure SWPPP implementation and compliance with the facility's NPDES permit within designated area of responsibility. • Provide recommendations for SWPPP revisions to the SWPPT leader based upon reviews and evaluations. Focus recommendations on pollution prevention and environmental protection. • Designate and direct qualified personnel to conduct and document appropriate response action for spills, leaks, or other discharges as addressed by this SWPPP. • Ensure that proper records maintenance and retention practices are implemented at the site within designated area of responsibility. • Provide training and technical guidance to implementing personnel within designated area of responsibility to ensure SWPPP implementation.
Implementing Site Personnel	• Understand and implement this SWPPP as directed by SWPPT members. • Properly handle all materials and wastes to ensure that pollutants are not allowed to contaminate storm water runoff or enter the storm water system. • Ensure that daily operations comply with this SWPPP and the facility's NPDES permit. • Assist with reviews and evaluations and implement corrective actions as deemed necessary to ensure continued compliance with this SWPPP. • Prepare and forward to the appropriate SWPPT member an after-action report summarizing the pertinent details of any spills, leaks, or other discharges. • Maintain and retain records of all relevant aspects of daily operations as required by this SWPPP and provide copies upon request to SWPPT members and/or the SWPPT leader.

Notes:

SWPPT = Storm Water Pollution Prevention Team
SWPPP = Storm Water Pollution Prevention Plan
NPDES = National Pollutant Discharge Elimination System
BMPs = best management practices

2.0 FACILITY INFORMATION

Facility Owner:	nexAir, LLC
Mailing Address:	5808 Old Millington Road Millington, Tennessee 38053
Location:	5808 Old Millington Road Millington, Tennessee 38053
Latitude/Longitude	35°17'4.80"N/-89°57'51.16"W
Telephone:	(901) 357-7333
Contact:	Brad Johnston, Plant Manager (901) 326-0198
TMSP Tracking No:	TNR050000/Pending
SIC Code:	2813 (Industrial Gases)
Receiving Water:	Loosahatchie River

2.1 Facility Location

U.S. EPA MSGP 2015 5.2.2: ***General Location Map.*** General location map. Provide a general location map (e.g., U.S. Geological Survey (USGS) quadrangle map) with enough detail to identify the location of your facility and all receiving waters for your stormwater discharges.

nexAir is located at 5808 Old Millington Road in Millington, Tennessee, in Shelby County. The facility location is shown on the U.S. Geological Survey map, presented as Figure 1 in Appendix B. The facility is comprised of approximately 6.6 acres of land, located one-third of a mile east of Highway 51. Buildings and pavement cover approximately 95% of the property.

2.2 Activities at Facility

U.S. EPA MSGP 2015 5.2.2. ***Activities at Facility.*** Your SWPPP must include a description of the nature of the industrial activities at your facility.

The facility has seven buildings and produces dry ice in various forms for industrial and commercial use. The equipment and accompanying oils used for this process are housed in Plant A which has a 1,376 gallon floor drain sump to capture any spills. Other buildings include Plant B, a garage, an office, and a receiving and distribution area.

2.3 Site Map

U.S. EPA MSGP 2015 5.1.2: ***Site Map.*** Your SWPPP site map must include the following:

- Boundaries of the property and the size of the property in acres
- Location and extent of significant structures and impervious surfaces
- Directions of stormwater flow (use arrows)
- Locations of all stormwater control measures
- Locations of all receiving waters, including wetlands, in the immediate vicinity of your facility. Indicate which waterbodies are listed as impaired and which are identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 waters
- Locations of all stormwater conveyances including ditches, pipes, and swales
- Locations of potential pollutant sources identified under Part 5.2.3.2
- Locations where significant spills or leaks identified under Part 5.2.3.3 have occurred
- Locations of all stormwater monitoring points
- Locations of stormwater inlets and outfalls, with a unique identification code for each outfall (e.g., Outfall 001, 002), indicating if you are treating one or more outfalls as "substantially identical" under Parts 3.2.3, 5.2.5.3, and 6.1.1, and an approximate outline of the areas draining to each outfall
- If applicable, municipal separate storm sewer systems (MS4s), where your stormwater discharges to them
- Areas of designated critical habitat for endangered or threatened species, if applicable
- Locations of the following activities where such activities are exposed to precipitation:
  - fueling stations
  - vehicle and equipment maintenance and/or cleaning areas
  - loading/unloading areas
  - locations used for the treatment, storage, or disposal of wastes
  - liquid storage tanks
  - processing and storage areas
  - immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility
  - transfer areas for substances in bulk
  - machinery
- locations and sources of run-on to your site from adjacent property that contains significant quantities of pollutants

The Site Map (Figure 2 in Appendix B) details potential pollutant sources from nexAir and includes the items detailed in the regulations cited above, and can be used to estimate the predicted flow of potential pollutants. The figure also identifies storm water drainage patterns and the drainage basin boundaries.

2.4 Description of Drainage Basins

The facility has two storm water outfalls that flow from the facility to an unknown tributary of the Loosahatchie River. The property is engineered so that a single drainage basin (DB #1) encompasses the entire facility and discharges at one of two outfalls (001 and 002), both on the southeastern side of the property. Storm water then discharges towards the Loosahatchie River, via the unnamed tributary.

2.5 Discharges to Water Quality Impaired/Water Quality Limited Waters

U.S. EPA MSGP 2015 2.2.2: ***Discharges to Water Quality-Impaired Waters:*** You are considered to discharge to an impaired water if the first water of the U.S. to which you discharge is identified by a state, tribe or EPA as not meeting an applicable water quality standard, and:

- Requires development of a TMDL (pursuant to section 303(d) of the CWA);
- Is addressed by an EPA-approved or established TMDL; or

Is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1).

All surface drainage from the site discharges an unnamed tributary, then to Loosahatchie River. Loosahatchie River is on TDEC's 2014 list of 303(d) streams. The TMSP requires that any additional permit requirements must be satisfied if they are put forth. At this time, there are no additional permit requirements for this receiving stream. The 303(d) information for the affected segment of the unnamed tributary of the Loosahatchie River, as included in the final approved 2014 list of 303(d) streams, are shown below. During annual site compliance evaluations, the 303(d) list should be reviewed for the addition of requirements that could affect nexAir, see Table 2-1.

Table 2-1
303(d) Streams

Water Body ID	Impacted Water Body	County	Miles/Acres Impaired	Cause/TMDL Priority	Pollutant Source	Comments
TN08010209002_0100	Unnamed Tributary of Loosahatchie River	Shelby	4.95	Escherichia coli (NA)	Discharges from Municipal Separate Storm Sewer Systems (MS4)	Category 4a. U.S. EPA approved a pathogen TMDL that addresses the known pollutant.

Notes:
TMDL = Total Maximum Daily Load
NA = Not Applicable
U.S. EPA = United States Environmental Protection Agency

2.6 EPCRA Section 313 Reporting Requirements

TNR05000 4.5.2. ***Additional Requirements for Stormwater Discharges Associated With Industrial Activity from Facilities Subject to Emergency Planning and Community Right to Know Act (EPCRA) Section 313 Requirements:*** Potential pollutant sources for which you have reporting requirements under EPCRA 313 must be identified in your risk identification and summary of potential pollutant sources determination as required under each industrial sector in this permit. Note this requirement only applies to you if you are subject to reporting requirements under EPCRA 313.

Tennessee has special requirements for facilities that have "Water Priority Chemicals" from Section 313 of the Superfund Amendments and Reauthorization Act. nexAir currently does not store any chemicals listed on the "Water Priority Chemicals" list in the TMSP permit under Addendum A: Pollutants Identified in Tables II and III of Appendix D of 40 CFR Part 122, in amounts

that trigger threshold quantities to require reporting under Superfund Amendments and Reauthorization Act 313; therefore, this section is not applicable.

2.7 Existing Environmental Management Plans

TNR05000 4.5.4. ***Consistency with Other Plans*****:** SWPPPs may reference the existence of other plans for Spill Prevention Control and Countermeasure (SPCC) plans developed for the facility under Section 311 of the CWA or Best Management Practices (BMP) Programs otherwise required by an NPDES permit for the facility as long as such requirement is incorporated into the SWPPP.

nexAir does not have an additional environmental management plans; therefore, this section is not applicable.

2.8 National Environmental Policy Act Compliance

2.8.1 Threatened and Endangered Species

TNR050000 1.2.5: ***Threatened and Endangered Species Protection.*** a) Issuance of a Notice of Coverage (NOC) under this permit will constitute confirmation of the division's finding that, with properly developed and implemented SWPPP, the discharges authorized hereunder are not likely to result in the taking of threatened and endangered species. b) Should the division later determine that the discharges covered by this permit would result in the taking of threatened or endangered species, or are otherwise not in compliance with the Endangered Species Act, the director, after written notification to the permittee, shall either:

i. Notify the permittee that it is no longer eligible for coverage under this permit and require coverage under an individual NPDES permit. The permittee will continue to be covered under this permit until the division issues an individual NPDES permit, provided a timely application for an individual permit is made. A timely application is defined as submitting to the division a complete permit application, including sampling, within 90 days of the notice from the director requiring the application. A permittee may request a later date for the timely submission of an individual NPDES permit application for just cause; or
ii. Notify the permittee that it must modify its SWPPP such that as a consequence, the discharges authorized by this permit will not result in the taking of threatened and endangered species and otherwise be in compliance with the Endangered Species Act. The permittee shall have 60 days after such notice to make such modifications to the SWPPP, and then 12 weeks to implement these modifications, unless the permittee justifies to the division that a longer time is necessary for their implementation. Should a longer time be required, the permittee shall submit to the division's local Environmental Field Office (see list of EFOs under subpart 3.3 on page 14 of this permit) a brief summary of the proposed modifications of SWPPP, including a timetable for implementation.

The storm water discharges from nexAir are not likely to adversely affect legally protected listed or proposed threatened or endangered aquatic animals (or species proposed for such protection). Research on the federally listed species for Shelby County revealed six known endangered, threatened, proposed, or candidate species that could be adversely affected by storm water discharges. It is recommended that the U.S. Fish and Wildlife Service's Endangered Species register for Shelby County, Tennessee, be periodically checked to ensure that any listed species can be identified: https://www.fws.gov/endangered/

2.8.2 National Registry of Historic Properties

U.S. EPA MSGP 2015 5.2.6.2 ***Documentation of Permit Eligibility Related to Historic Places.*** You must keep with your SWPPP the documentation supporting your determination with regard to Part 1.1.4.6 (Historic Properties Preservation).

Storm water discharges at nexAir will not have the potential to affect historic properties, as there are no properties surrounding the facility registered with the National Registry of Historic Properties.

2.9 History of Spills and Leaks

TNR05000 Sector C 3.2.2.3 ***Spills and Leaks —*** A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at areas that are exposed to precipitation or that otherwise drain to a stormwater conveyance at the facility after the date of 3 years prior to the date of the submission of an NOI to be covered under this permit. Such list shall be updated as appropriate during the term of the permit.

No significant (reportable) spills or leaks of toxic or hazardous pollutants that involved contamination of storm water or that otherwise drained to a storm water conveyance have occurred at the nexAir facility in the past three years.

Any significant spills or leaks that contaminate storm water will be documented and included in the annual compliance evaluation as detailed in Section 5.

3.0 INVENTORY OF POTENTIAL POLLUTANT SOURCES AND CORRESPONDING BEST MANAGEMENT PRACTICES

U.S. EPA MSGP 2015 5.2.3: ***Summary of Potential Pollutant Sources.*** You must describe areas at your facility where industrial materials or activities are exposed to stormwater and from which allowable non-stormwater discharges originate. Industrial materials or activities include, but are not limited to material handling equipment or activities; industrial machinery; raw materials; industrial production and processes; and intermediate products, by-products, final products, and waste products. Material handling activities include, but are not limited to, the storage, loading and unloading, transportation, disposal, or conveyance of any raw material, intermediate product, final product or waste product. For structures located in areas of industrial activity, you must be aware that the structures themselves are potential sources of pollutants. This could occur, for example, when metals such as aluminum or copper are leached from the structures as a result of acid rain.

An inventory of materials and other miscellaneous outdoor storage items is included in sources of potential pollutants is included in Table 3-1 which provides detailed information on the potential pollutant sources identified at the facility. The table also includes the BMPs that prevent pollution at the facility.

Table 3-1
Facility Pollution Sources Inventory
Miscellaneous Outdoor Storage

Container Type	Location	Product Stored	Container Capacity	Container Material	Secondary Containment	Key Best Management Practices/ Deficiencies	Flow Direction and Distance/ Drainage Basin
General Trash Dumpster	Throughout the facility	General Trash	Varies	Steel	N	Covered lid / None	Sump or Sheet Flow to SW1 / All Basins
AST	South of Plant A	Diesel	300-gallons	Steel	Y	Containment dike / None	350 feet SE to 001
Transformer	South of Plant A	Dielectric Mineral Oil	728-gallons	Steel	N	None / None	300 feet SE to 001

Notes:
N — No
Y — Yes
001 — Storm Water Outfall 1
AST — Aboveground Storage Tank

3.1 Best Management Practices

U.S. EPA MSGP 2015 2.1: ***Control Measures.*** You must select, design, install, and implement control measures (including best management practices) to minimize pollutant discharges that address the selection and design considerations in Part 2.1.1, meet the non-numeric effluent limits in Part 2.1.2, meet limits contained in applicable effluent limitations guidelines in Part 2.1.3, and meet the water quality-based effluent limitations in Part 2.2. The selection, design, installation, and implementation of these control measures must be in accordance with good engineering practices and manufacturer's specifications. Note that you may deviate from such manufacturer's specifications where you provide justification for such deviation and include documentation of your rationale in the part of your SWPPP that describes your control measures, consistent with Part 5.2.4. If you find that your control measures are not achieving their intended effect of minimizing pollutant discharges, you must modify these control measures per the corrective action requirements in Part 4. Regulated stormwater discharges from your facility include stormwater run-on that commingles with stormwater discharges associated with industrial activity at your facility.

U.S. EPA emphasizes implementing pollution prevention measures and BMPs that reduce possible pollutant discharges at the source. Source reduction measures include, among others, preventive maintenance, chemical substitution, spill prevention, good housekeeping, training, and proper materials management. Where such practices are not appropriate to a particular source or do not effectively reduce pollutants in storm water discharges, U.S. EPA supports using source control measures and BMPs such as material segregation or covering, water diversion, and dust control. Like source reduction measures, source control measures, and BMPs are intended to keep pollutants out of storm water. The remaining classes of BMPs, which involve recycling or storm water treatment, allow reusing storm water or attempting to lower pollutant concentrations before discharge.

BMPs are to be implemented to the MEP. Due to changing technology, MEP is an ever-changing goal. The SWPPT will continue to review activities at nexAir and determine what additional BMPs should be implemented at the plant. Additional BMP needs could result from changes in activities performed in the building or outside areas. Personnel changes may result in some of the items on the existing BMP lists moving to the implementation BMP lists, if training is not performed regularly. Some of the recommended BMPs are structural (requiring construction), while others are nonstructural (source control). The SWPPT will review the recommended structural BMPs and provide an implementation period. Nonstructural BMPs can be implemented more easily, while structural BMPs require funding and a construction timetable. A BMP Manual is included in Appendix C of this SWPPP.

The following is a list of general BMPs implemented throughout the facility:

- Constantly improving machinery operation, maintenance, and processes.
- Maintaining current chemical and waste material inventory.

- Labeling all containers indicating name, type of substance, and handling hazards associated with that material.
- Maintaining well-organized work areas.
- Inspecting storage areas and properly removing and disposing of potential pollutants.
- Adhering to maintenance and inspection programs required at site.
- Training employees about good housekeeping practices and storm water pollution prevention.
- Maintaining records and properly reporting incidents.
- Reporting all spills to a single contact, the Plant Manager.
- Maintaining good housekeeping procedures throughout the facility.
- Minimizing exposure of pollutant sources to rainfall and/or runoff.
    - Using grading, berming, or curbing to prevent runoff of contaminated flows and diverting run-on away from these areas.
    - Locating materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confining storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas).
    - Cleaning up spills and leaks promptly using dry methods (e.g., absorbents) to prevent pollutant discharges.
    - Using drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible.

U.S. EPA MSGP 2015 2.1.2.1: ***Minimizing Exposure.*** You must minimize the exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff in order to minimize pollutant discharges by either locating these industrial materials and activities inside or protecting them with storm resistant coverings.

- Using spill/overflow protection equipment.
- Draining fluids from equipment and vehicles before onsite storage or disposal.
- Performing all cleaning operations indoors, under cover, or in bermed areas to prevent runoff and run-on and capture any overspray.
- Ensuring that all wash water drains to a proper collection system (i.e., not the storm water drainage system).
- Ensuring vehicles or equipment maintenance is performed under a roof whenever possible.

- Eliminating, to the MEP, authorized non-storm water discharges.
- Using proper security measures throughout the facility.
- Practicing good housekeeping (required by TNR050000) by keeping areas that may contribute pollutants to storm water discharges clean and orderly. Particular attention is paid to areas where materials are stockpiled or handled, storage areas, liquid storage tanks, and loading/unloading areas.
- Keeping spill kits readily available for all liquid storage areas, maintenance shop, and all receiving areas. The kits are clearly labeled and easily accessible.
- Floatable debris is swept from the ground on a routine basis.
- Any hazardous materials stored outside shall be in closed containers, stored under cover, and have proper secondary containment.
- Any hazardous and non-hazardous liquids shall be placed in or on secondary containment structures, spill pallets, etc.
- Drums, totes, and containers that are not empty are stored away from the direct flow of traffic.

3.2 Non-Storm Water Discharge Management

TMSP 2015 3.1.2: ***Allowable Non-Storm-Water Discharges.***
Discharges of material other than stormwater must be in compliance with an NPDES permit (other than this permit and as listed below) issued for the discharge. This permit authorizes the following non-stormwater discharges:

- Fire hydrant flushings;
- Potable water including water line flushings;
- Uncontaminated air conditioning or compressor condensate;
- Irrigation drainage;
- Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with manufacturer's instructions;
- Washing of sidewalks, buildings, etc. to which no detergents have been added; wash water should also be free of any other pollutants such as sediment, debris, etc.
- Uncontaminated ground water or spring water;
- Foundation or footing drains where flows are not contaminated with process materials such as solvents;
- Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of your facility, but NOT intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains).
- Discharges from wet deck storage areas, which are authorized only if no chemical additives are used in the spray water or applied to the logs.

Permit TNR050000 requires that the SWPPP include a certification that storm water discharges have been tested or evaluated for the presence of non-storm water discharges. nexAir currently has no non-storm water discharges. However, allowable non-storm water discharges, which are standard discharges per TDEC and U.S. EPA, include firefighting activities, leaking potable water pipes, and air-conditioning condensate.

3.3 Good Housekeeping

The good housekeeping practices that will be implemented at this facility are detailed in Table 3-1 , and include all possible operations exposed to storm water.

Good engineering controls to prevent leaks, spills, and overfilling, and site-specific BMPs for each item are detailed above in Section 3.1. The following BMPs are recommended for the facility's outdoor storage areas to increase prevention of leaks and spills.

Best Management Practices for Miscellaneous Outdoor Storage
• Spill kits are in the area.
• Areas will be well-maintained and clean, with visual inspections routinely conducted.
• Employees are trained in spill prevention measures and techniques.
• Items are cleaned of solids and oils before storing outdoors. Any items to be placed in the storage areas are evaluated for disposal and secondary containment requirements. In addition, any liquid storage compartments are emptied and cleaned.

3.4 Preventive Maintenance

nexAir has a preventive maintenance program that includes timely inspection and maintenance of storm water management devices, as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures that would result in discharges of pollutants to the surface waters. The preventive maintenance program ensures appropriate maintenance of such equipment and systems.

4.0 ANALYSIS OF HISTORICAL AND POTENTIAL POLLUTANTS

4.1 Sampling Data

U.S. EPA MSGP 2015 5.2.3.6: ***Sampling Data.*** Existing discharges must summarize all stormwater discharge sampling data collected at the facility during the previous permit term. The summary shall include a narrative description (and may include data tables/figures) that adequately summarizes the collected sampling data to support identification of potential pollution sources at your facility. New dischargers and new sources must provide a summary of any available stormwater runoff data they may have.

Annual storm water monitoring has been conducted and tested for the following parameters: ammonia, total recoverable aluminum, copper, iron, mangnesium, and nitrate plus nitrite nitrogen. Results from previous storm water sampling events (2008 – 2015) are summarized in Appendix D.

4.2 Pollutants

U.S. EPA MSGP 2015 5.2.3.2: ***Pollutants.*** A list of the pollutant(s) or pollutant constituents (e.g., crankcase oil, zinc, sulfuric acid, and cleaning solvents) associated with each identified activity, which could be exposed to rainfall or snowmelt and could be discharged from your facility. The pollutant list must include all significant materials that have been handled, treated, stored, or disposed, and that have been exposed to stormwater in the three years prior to the date you prepare or amend your SWPPP.

nexAir potential pollutant sources are identified on Figure 2 in Appendix B. Table 4-1 presents the plant's associated pollutant risks.

Table 4-1
Risk Identification and Summary of Potential Pollutant Sources

	Oil and Grease	Organic Material/TSS	Metals	Oxygen Demand
Oil storage	X		X	
Scrap metal exposed to rain	X	X	X	X
Garbage roll-off bins		X		X
Filled gas/liquid tanks, cylinders, and trucks			X	X
Empty trailer/cylinder storage		X		X
Dimethylformamide (DMF) Tote storage	X			
Loading/unloading of trucks	X	X	X	X

Note:
TSS = Total Suspended Solids

5.0 STORM WATER INSPECTION AND EVALUATION PROGRAM

TNR050000 requires developing and implementing a storm water inspection and evaluation program. The program must include monthly facility inspections, quarterly visual examinations of storm water discharge, annual analytical monitoring of storm water discharge, and annual comprehensive site compliance evaluations.

The objectives of this program are to:

- Demonstrate compliance with the permit.
- Demonstrate compliance with implementing the SWPPP.
- Measure the effectiveness of BMPs in eliminating pollutants in industrial storm water discharges.

The program also contains the following:

- Rationale for selecting sample locations.
- Sampling techniques, schedule, and reporting requirements.
- Procedures and schedules for evaluating the effectiveness of the monitoring program in achieving program objectives.

Appendix E contains the following blank forms that can be used to comply with these requirements: Monthly Facility-Wide Environmental form, Quarterly Visual Examination Report, Storm Water Inspection Checklist Corrective Action Form, and Annual Comprehensive Site Compliance Evaluation form. Facility and equipment inspections are documented and inspection records are maintained in the nexAir files in Appendix E of this SWPPP.

5.1 Monthly Facility Inspections

U.S. EPA MSGP 2015 3.1.2: ***Routine Facility Inspection Documentation.*** You must document the findings of your facility inspections and maintain this report with your SWPPP as required in Part 5.5. Do not submit your routine facility inspection report to EPA, unless specifically requested to do so. However, you must summarize your findings in the annual report per Part 7.5. Documental all findings, including but not limited to, the following information:

- The inspection date and time;
- The name(s) and signature(s) of the inspector(s)
- Weather information
- All observations relating to the implementation of control measures at the facility, including:
  - A description of any discharges occurring at the time of the inspection
  - Any previously unidentified discharges from and/or pollutants at the site
  - Any evidence of, or the potential for, pollutants entering the drainage system
  - Observations regarding the physical condition of and around all outfalls, including any flow dissipation devices and evidence of pollutants in discharges and/or the receiving water
  - Any control measures needing maintenance, repairs, or replacement
- Any additional control measures needed to comply with the permit requirements
- Any incidents of noncompliance observed
- A statement, signed and certified in accordance with Appendix B, Subsection 11.

TNR050000 requires routine inspection of designated equipment and areas of the facility for BMP deficiencies or other incidences of noncompliance. Monthly facility inspections should be performed under the supervision of the Plant Manager using the Monthly Facility Inspection Form in Appendix E. Tracking procedures are used to ensure that appropriate actions are taken in response to inspection.

The monthly inspection reports include date, time, name of inspector, weather conditions, and follow-up action needed. Before each inspection, the SWPPP and previous inspection reports will be reviewed to ensure that adequate response and corrective actions have been taken in response to previous inspections.

Qualified personnel, who use equipment, perform inspections of equipment each workday. Material handling areas and equipment are inspected for evidence of, or the potential for, pollutants entering the drainage system on an ongoing basis. Necessary adjustments, replacements, maintenance, and repairs are made as soon as feasible, with precautionary measures taken promptly to avoid or halt the entrance of pollutants into the drainage system.

All areas exposed to precipitation at the facility are visually inspected for evidence of, or the potential for, pollutants to enter the drainage system. Measures to reduce pollutant loadings are evaluated to determine whether they are adequate and properly implemented or whether additional control measures are needed. Structural storm water management measures required under this section are observed to ensure that they are operating correctly. Visual equipment inspections needed to implement the SWPPP, such as spill response equipment, are also included.

5.2 Storm Water Sampling

TMSP 5.1.4 ***Representative Discharge.*** When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan. The permittee shall include the description of the location of the outfalls, explanation of why outfalls are expected to discharge substantially identical effluents, and estimate of the size of the drainage area and runoff coefficient with the TMSP Storm Water Monitoring Report.

The facility has been engineered to drain into one drainage basin which discharges into one of two outfalls, 001 or 002. Outfall 001 has been chosen as a representative outfall due to the close proximity (approximately 80 feet apart) of the outfalls and the fact that the facility discharges all flow to a single drainage basin.

5.2.1 Quarterly Visual Monitoring of Storm Water Discharge

nexAir shall perform and document a visual examination of storm water discharge from Outfall 001. The examination should be done once during daylight hours during each of the following periods: January through March, April through June, July through September, and October through December. Examinations will be made of samples collected during the first 30 minutes (or as soon thereafter as practical, but not to exceed one hour) of when runoff begins discharging. The examinations shall document observations of color, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other indicators of storm water pollution. The samples inspected will be collected from a storm water event that is greater than 0.1 inch in magnitude and which occurs at least 72 hours after a previously measurable (greater than 0.1 inch) storm event. Visual examination reports will be maintained in Appendix E.

If storm water visual inspection samples cannot be collected during the designated periods, nexAir must document the reason for not performing the inspection. The visual examination should include observations of the parameters identified in Table 5-1. The information to be reported includes the inspection date, the inspection personnel, the visual quality of the storm water discharge, and probable sources of any observed storm water contamination. No analytical tests will be performed on visual samples.

Table 5-1 **Visual Monitoring Parameters**	
Color	Oil sheen
Odor	Floating solids
Settled Solids	Suspended Solids
Turbidity (clarity)	Foam
Other obvious indicators of storm water pollution.	

Visual observation reports should be maintained in Appendix E of this SWPPP. The report will include the examination date and time, personnel, the nature of the discharge, visual quality of the storm water discharge, presence of suspected non-storm water discharges, and probable sources of any observed storm water contamination.

The results of the visual monitoring will be used to determine the effectiveness of the BMPs that have been implemented as a part of the SWPPP. Visual examinations will not assess chemical properties of the storm water; however, they will provide results on which nexAir can react quickly. If either the visual inspections and/or the visual monitoring indicate the presence of significant sources of non-storm water discharges, the SWPPP will need to be amended and corrective actions implemented as soon as practical.

5.2.2 Annual Analytical Monitoring Requirements

TNR050000 requires that nexAir monitor storm water discharge from Outfall 001 once per calendar year. The industry monitoring requirements for industrial gas facilities include the parameters listed in Table 5-2.

Table 5-2 **TMSP Analytical Monitoring Requirements**	
Pollutants of Concern	**Benchmark (mg/L)**
Nitrate plus Nitrite Nitrogen	0.68
Total Recoverable Aluminum	0.75
Total Recoverable Copper	0.018
Total Recoverable Magnesium	0.064
Total Recoverable Iron	5.0
Ammonia	4.0

Note:
mg/L = Milligrams per Liter

A minimum of one grab sample will be collected. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inch in magnitude and that occurs at least 72 hours after the previously measurable (greater than 0.1 inch) storm event. In addition to the parameters above, nexAir will record the duration (in hours) of the storm, the duration from the last measurable (greater than 0.1 inch) storm event, and an estimate of the total volume (in gallons) of the discharge sampled. The grab sample shall be taken during the first 30 minutes of the discharge.

TNR050000 has designated benchmark concentrations for Sector C parameters. If, for any reason, nexAir's annual monitoring results exceed a benchmark concentration, nexAir must notify the TDEC Division of Water Pollution, Environmental Assistance Center in writing within 30 days from the time the monitoring results are received, describing the likely cause of the exceedance(s). Furthermore, within 60 days from the time the monitoring results are received, nexAir must review its SWPPP and make any necessary modifications or changes that would assist in reducing effluent concentrations to less than the monitoring benchmark concentration. A brief summary of the proposed SWPPP modifications will be submitted to TDEC's Division of Water Pollution local Environmental Field Office, along with a timetable for implementation:

TDEC Memphis Field Office
8383 Wolf Lake Drive
Bartlett, Tennessee 38133-4119

5.2.3 General Monitoring Waivers

TNR050000, 5.1.3.1 Adverse Conditions Waiver: When a discharger is unable to collect samples within a specified sampling period due to adverse climatic conditions, the discharger shall collect a substitute sample from a separate qualifying event in the next monitoring period and submit the data along with the data for the routine sample in that period. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous or inaccessible conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.), or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

In the event nexAir is unable to collect samples within the sampling period due to adverse weather conditions, nexAir should collect a substitute sample from a separate qualifying event in the following monitoring period.

5.2.4 Reporting Requirements

nexAir will submit results for each annual monitoring sample collected to the state 30 days after the sampling results are obtained, but no later than the March 31st of the following calendar year. Results will be entered on a Storm Water Monitoring Report Form (Appendix E) and submitted electronically to **Water.Permits@tn.gov**. Keep a copy of the completed form in Appendix E of the SWPPP.

5.3 Annual Comprehensive Site Compliance Evaluation

TMSP Sector C 3.2.4 & 3.2.4.1 ***Comprehensive Site Compliance Evaluation***: Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the SWPPP, but in no case less than once a year. Evaluations shall be conducted at least once at portable plant locations that are not in operation for a complete year. Such evaluations shall provide: (3.2.4.1) Areas contributing to a stormwater discharge associated with industrial activity including; material storage and handling areas, liquid storage tanks, hoppers or silos, vehicle and equipment maintenance, cleaning, and fueling areas, material handling vehicles, equipment and processing areas, and areas where aggregate is stockpiled outdoors shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system (and potentially waters of the state). Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural stormwater management measures, (e.g., oil/water separators, detention ponds, sedimentation basins or equivalent measures) sediment and erosion control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as dust collection equipment and spill response equipment, shall be made.

The annual comprehensive site inspection is conducted to achieve a "big picture" look at the facility's permit compliance. The annual site comprehensive compliance evaluation will be conducted by reviewing all forms for the year: the monthly facility inspections, quarterly visual outfall examinations, spill reports, non-storm water evaluation reports, etc. The results of this evaluation will be used to update the SWPPP, if necessary.

This inspection will also evaluate all current practices for reducing pollutants in storm water to determine whether these practices are effective, or if further controls are necessary. Structural control measures such as berms and piping will also be inspected and all necessary repairs or problems with these systems will be documented. Inspection areas shall include, at minimum, all storm water outfalls; exterior equipment; spill prevention and containment equipment; and all loading/unloading, storage, parking, and waste management areas.

Inspections must evaluate all areas contributing to storm water discharges associated with industrial activity to determine whether the SWPPP adequately minimizes pollutant loadings. Inspections will also ensure that the SWPPP is properly implemented in accordance with the terms of TMSP or if additional control measures are needed.

A report summarizing the scope of the evaluation, the personnel making the evaluation, the date of the evaluation, observations made during the evaluation, and any actions taken shall be recorded on an Annual Comprehensive Site Compliance Evaluation form (in Appendix E). The completed annual inspection form must be retained as a part of the SWPPP (records are kept in Appendix E) for at least three years after the date of the evaluation. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the

SWPPP. Where the compliance evaluation overlaps with a required (quarterly) inspection, the compliance evaluation may be conducted in place of such inspection.

5.3.1 Follow-Up Actions

U.S. EPA MSGP 2015 4.4: ***Corrective Action Documentation***. You must document the existence of any of the conditions listed in Parts 4.1 or 4.2 within 24 hours of becoming aware of such condition. You are not required to submit your corrective action documentation to EPA, unless specifically requested to do so. However, you must summarize your findings in the annual report per Part 7.5. Include the following information in your documentation:

- Description of the condition triggering the need for corrective action review. For any spills or leaks, include the following information: a description of the incident including material, date/time, amount, location, and reason for spill, and any leaks, spills or other releases that resulted in discharges of pollutants to water of U.S., through stormwater or otherwise
- Date the condition was identified
- Description of immediate actions taken pursuant to part 4.3.1 to minimize or prevent the discharge of pollutants. For any spills or leaks, include response actions, the date/time clean-up completed, notifications made, and staff involved. Also include any measures taken to prevent the reoccurrence of such releases (Part 2.1.2.4)
- A statement, signed and certified in accordance with Appendix B, Subsection 11

You must also document the corrective actions taken or to be taken as a result of the conditions listed in Part 4.1 or 4.2 (or, for triggering events in Part 4.2 where you determine that corrective action is not necessary, the basis for this determination) within 14 days from the time of discovery of any of those conditions. Provide the dates when each corrective action was initiated and completed (or is expected to be completed). If applicable, document why it is infeasible to complete the necessary installations or repairs within the 14-day timeframe and document your schedule for installing the controls and making them operational as soon as practicable after the 14-day timeframe. If you notified EPA regarding an extension of the 45 day timeframe, you must document your rationale for an extension.

Within 24 hours of discovery of conditions requiring review and revision to eliminate a problem or conditions requiring review to determine whether modifications are necessary, nexAir will document the conditions. Within 14 days of the discovery, nexAir will document corrective actions to be taken or provide the basis for determination that corrective action is not needed.

Corrective actions will be implemented before the next storm event, if possible, or as soon as practicable following the next storm event.

5.3.2 Compliance Evaluation Report

The annual Comprehensive Site Compliance Evaluation (use form included in Appendix E) shall be completed and retained with this Plan for at least 3 years. The report will summarize the scope of the inspection, personnel making the inspection, the date of the inspection, major observations, and actions taken. This report must be reviewed and signed in accordance with the regulatory citation in Section 9.

All documentation associated with noncompliance activities will be retained with the SWPPP for at least 3 years after the date of evaluation.

6.0 EMPLOYEE TRAINING

U.S. EPA MSGP 2015 2.1.2.8: ***Employee Training.*** You must train all employees who work in areas where industrial materials or activities are exposed to stormwater, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of your storm water pollution prevention team. You must ensure the following personnel understand the requirements of this permit and their specific responsibilities with respect to those requirements:

- Personnel who are responsible for the design, installation, maintenance, and/or repair of controls (including pollution prevention measures)
- Personnel responsible for the storage and handling of chemicals and materials that could become contaminants in stormwater discharges
- Personnel who are responsible for conducting and documenting monitoring and inspections as required in Parts 3 and 6
- Personnel who are responsible for taking and documenting corrective actions as required in Part 4

Personnel must be trained in at least the following if related to the scope of their job duties (e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections):

- An overview of what is in the SWPPP
- Spill response procedures, good housekeeping, maintenance requirements, and material management practices
- The location of all controls on the site required by this permit and how they are to be maintained
- The proper procedures to follow with respect to the permit's pollution prevention requirements

When and how to conduct inspections, record applicable findings, and take corrective actions

A personnel training program is essential to effectively implement the SWPPP. Personnel at all levels of responsibility will be trained in the components and goals of the NPDES permit and the SWPPP. Training will address each component of the SWPPP; including how and why tasks are to be implemented.

At a minimum, the following will be part of the training program:

1. Storm water control training appropriate to personnel job function shall be provided for the SWPPT, supervisors, and other operating personnel. A training and educational program for employees shall be developed for implementing appropriate activities identified in the SWPPP.

2. Personnel will be trained to **identify and manage potential spills** that can occur from equipment and containers of petroleum products (i.e., diesel fuel, oil, lubricating grease, hydraulic fluids, etc.), coatings, and thinners. Employees must report incidents of leaking fluids to management.

3. All employees will be trained in **inspection and good housekeeping practices,** which include the following:

    - Proper container and scrap inspection, handling, and storage procedures

- Cleaning up spilled materials
- Identifying where brooms, vacuums, sorbents, foams, neutralizing agents, and other good housekeeping and spill response equipment are located
- Instruction on securing drums and containers
- Frequently checking for leaks and spills of various materials

4. All personnel will be trained to **recognize toxic and hazardous substances** at the facility. Personnel training will include the following:

    - Proper materials organization and storage
    - Appropriate identification of toxic and hazardous substances stored, handled, and produced onsite
    - Proper inspection and acceptance of inbound containers and of scrap metal prior to placement in dumpster.

Personnel refresher training will be held annually. New personnel will receive training within 3 months of assignment. All personnel training will be documented on the Training Sign-In Sheet in Appendix F and maintained as part of this SWPPP. The SWPPT Leader will coordinate training for all SWPPT members in the elements of the SWPPP. The SWPPT members will coordinate training on the proper implementation of BMPs for all personnel within their jurisdiction. Training records will be kept with this SWPPP.

7.0 SPILL PREVENTION AND RESPONSE

U.S. EPA MSGP 2015 2.1.2.4: ***Spill Prevention and Response Procedures.*** You must minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur in order to minimize pollutant discharges. You must conduct spill prevention and response measures, including but not limited to the following:

- Plainly label containers (e.g., "Used Oil," "Spent Solvents," "Fertilizers and Pesticides") that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur.
- Implement procedures for material storage and handling, including the use of secondary containment and barriers between material storage and traffic areas, or a similarly effective means designed to prevent the discharge of pollutants from these areas.
- Develop training on the procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. As appropriate, execute such procedures as soon as possible.
- Keep spill kits on-site, located near areas where spills may occur or where a rapid response can be made.
- Notify appropriate facility personnel when a leak, spill, or other release occurs.
- Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period, you must notify the National Response Center (NRC) at (800) 424-8802 or, in the Washington, DC, metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117, and 40 CFR Part 302 as soon as you have knowledge of the discharge. State or local requirements may necessitate reporting spills or discharges to local emergency response, public health, or drinking water supply agencies. Contact information must be in locations that are readily accessible and available.

Table 3-1 details the spill prevention and response for each potential pollutant source at nexAir. In the event of a spill or release of oil, hazardous material, waste and/or other potential pollutant that could affect storm water quality, the person discovering the spill or leak shall immediately notify the Plant Manager and/or immediate Supervisor.

The Plant Manager or designee, with the assistance of environmental personnel, shall immediately assess the nature, amount, and extent of the release; and shall identify the source. The Plant Manager will then coordinate the mobilization of the necessary personnel and resources for the spill or leak cleanup. An area of isolation shall be established around the release to prevent personnel exposure. Only personnel involved in the emergency operations shall be allowed within the designated and marked area. Further actions will include:

- Ensuring that all required steps have been taken to clean up the spill
- Reporting the spill to the appropriate regulatory agencies
- Reviewing and revising the measures and controls to prevent the recurrence of such an event

Leaks and spills should be contained and cleaned up as soon as possible. If malfunctioning equipment is the cause of the spill or leak, repairs should also be conducted as soon as possible. Cleanup procedures include using dry absorbent materials or other cleanup methods. Spill kits are maintained at appropriate locations throughout the plant. Used absorbent material will be disposed of properly.

If spill is inside the building:

- If a container is leaking, do not take the container outside the building.
- Make every reasonable attempt to keep the material from leaving the building. This includes diking doorways, using material such as, but not limited to, oil dry, straw, sand bags, or saw dust. The spilled material would then be absorbed and placed in drums for offsite shipment to a disposal facility.

Outside of building:

- If a container is leaking, do not move the container.
- If possible, rotate the container to a position so the leak stops.
- Dike the area around the spill and container and start clean up procedure.
- Clean up procedures include but are not limited to, solidifying, vacuuming, or transferring the material to another container for safe movement and disposal.

If a spill cleanup is outside the capabilities of nexAir personnel, an outside contractor would be hired to do the work.

8.0 MANAGEMENT OF RUNOFF

U.S. EPA MSGP 2015 2.1.2.6: ***Management of Runoff.*** You must divert, infiltrate, reuse, contain, or otherwise reduce stormwater runoff to minimize pollutants in your discharges. In selecting, designing, installing, and implementing appropriate control measures, you are encouraged to consult with EPA's internet-based resources relating to runoff management, including the sector-specific Industrial Stormwater Fact Sheet Series, (http://water.epa.gov/polwaste/npdes/stormwater/EPA-Multi-Sector-General-Permit-MSGP.cfm), National Menu of Stormwater BMPs (http://water.epa.gov/polwaste/npdes/swbmp/index.cfm), and National Management Measures to Control Nonpoint Source Pollution from Urban Areas (http://water.epa.gov/polwaste/nps/urban/), and any similar state or tribal resources.

The nexAir BMP Manual is in Appendix C. These BMPs may be used to troubleshoot new BMPs needed at the plant. All BMPs that are in place will be maintained to ensure that they function as designed. BMPs should be designed to minimize pollution.

The term "minimize" means reduce and/or eliminate to the extent achievable using control measures (including BMPs) that are technologically available and economically practicable and achievable in light of best industry practice. nexAir management should consider the following when selecting and designing control measures:

U.S. EPA MSGP 2015 2.1.2.3: ***Maintenance.*** You must maintain all control measures that are used to achieve the effluent limits required by this permit in effective operating condition, as well as all industrial equipment and systems, in order to minimize pollutant discharges. This includes:

- Performing inspections and preventive maintenance of storm water drainage, source controls, treatment systems, and plant equipment and systems that could fail and result in contamination of storm water.
- Diligently maintaining non-structural control measures (e.g., keep spill response supplies available, personnel appropriately trained).
- Inspecting and maintaining baghouses at least quarterly to prevent the escape of dust from the system and immediately removing any accumulated dust at the base of the exterior baghouse.

Cleaning catch basins when the depth of debris reaches two-thirds (2/3) of the sump depth and keeping the debris surface at least six inches below the lowest outlet pipe.

- Preventing storm water from coming into contact with polluting materials is generally more effective, and less costly, than trying to remove pollutants from storm water.

- Using control measures in combination is more effective than using control measures in isolation for minimizing pollutants for storm water discharge.

- Assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective control measures.

- Attenuating flow using open vegetated swales and natural depressions can reduce in-stream impacts of erosive flows.

- Conserving and/or restoring riparian buffers will help protect streams from storm water runoff and improve water quality.

8.1 Sediment and Erosion Control

U.S. EPA MSGP 2015 2.1.2.5: ***Erosion and Sediment Controls.*** You must minimize erosion by stabilizing exposed soils at your facility in order to minimize pollutant discharges and placing flow velocity dissipation devices at discharge locations to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points. You must also use structural and non-structural control measures to minimize the discharge of sediment. If you use polymers and/or other chemical treatments as part of your controls, you must identify the polymers and/or chemicals used and the purpose in your SWPPP. There are many resources available to help you select appropriate BMPs for erosion and sediment control, including EPA's Stormwater Discharges from Construction Activities website at: http://water.epa.gov/polwaste/npdes/stormwater/EPA-Construction-General-Permit.cfm.

nexAir management must provide appropriate source control, stabilization measures, nonstructural and structural controls, or an equivalent for erosion and sediment control. All surfaces at the facility (including those that are routinely driven on by forklifts and other heavy equipment) are paved to prevent erosion. If erosion becomes a problem in the future, nexAir Management should consider, either individually or in combination, the following erosion and sediment control measures:

- Filtering or diversion practices, such as filter fabric fence, sediment filter boom, earthen or gravel berms, curbing, or other equivalent measure.

- Catch basin filters, filter fabric fence, or equivalent measure, placed in or around inlets or catch basins that receive runoff from poorly stabilized areas.

- Sediment traps, vegetative buffer strips, or equivalent, to remove sediment before discharge through an inlet or catch basin.

- Detention or retention basin or other equivalent structural control.

Use the BMP Manual in Appendix C as a resource when determining new BMPs to be used at the facility.

9.0 PERMIT AND STORM WATER POLLUTION PREVENTION PLAN ADMINISTRATION

9.1 Copy of Permit Requirements

U.S. EPA MSGP 2015 5.5: ***Additional Documentation Requirements.*** You are required to keep the following inspection, monitoring, and certification records with your SWPPP that together keep your records complete and up-to-date, and demonstrate your full compliance with the conditions of this permit:

- A copy of the NOI submitted to EPA along with any correspondence exchanged between you and EPA specific to coverage under this permit.
- A copy of the acknowledgment letter you receive from the EPA assigning your NPDES ID.
- A copy of this permit (an electronic copy easily available to SWPPP personnel is also acceptable).
- Documentation of maintenance and repairs of control measures, including the date(s) of regular maintenance, date(s) of discovery of areas in need of repair/replacement, and for repairs, date(s) that the control measure(s) returned to full function, and the justification for any extended maintenance/repair schedules (see Part 2.1.2.3)
- All inspection records, including the Routine Facility Inspection Reports (see Part 3.1.2) and Quarterly Visual Assessment Reports (see Part 3.2.2)
- Description of any deviations from the schedule for visual assessments and/or monitoring, and the reason for the deviations (e.g., adverse weather or it was impracticable to collect samples within the first 30 minutes of a measurable storm event) (see Parts 3.2.3 and 6.1.5)
- Corrective action documentation required per Part 4.4
- Documentation of any benchmark exceedances and the type of response to the exceedance you employed, including:
  - the corrective action taken
  - a finding that the exceedance was due to natural background pollutant levels
  - a determination from EPA that benchmark monitoring can be discontinued because the exceedance was due to run-on
  - a finding that no further pollutant reductions were technologically available and economically practicable and achievable in light of best industry practice consistent with Part 6.2.1.2.
- Documentation to support any determination that pollutants of concern are not expected to be present above natural background levels if you discharge directly to impaired waters, and that such pollutants were not detected in your discharge or were solely attributable to natural background sources (see Part 6.2.4.1)
- Documentation to support your claim that your facility has changed its status from active to inactive and unstaffed with respect to the requirements to conduct routine facility inspections (see Part 3.1.1), quarterly visual assessments (see Part 3.2.3), benchmark monitoring (see Part 6.2.1.3), and/or impaired waters monitoring (see Part 6.2.4.2)

A copy of the NDPES general permit TNR050000 for Storm Water Discharges Associated with Industrial Activities for Sector C of the TMSP is in Appendix A. Once coverage under the TMSP is issued, nexAir must maintain a copy of the facility's Notice of Coverage with this SWPPP.

9.2 Applicable State, Tribal, or Local Plans

This SWPPP is consistent with the State of Tennessee permit in Appendix A. There are no other applicable plans.

9.3 Maintaining Updated Storm Water Pollution Prevention Plan

U.S. EPA MSGP 2015 5.3: ***Required SWPPP Modifications.*** You must modify your SWPPP based on the corrective actions and deadlines required under Part 4.3 and that you documented under Part 4.4. SWPPP modifications must be signed and dated in accordance with Appendix B, Subsection 11.

nexAir will update the SWPPP when there is a change at the facility that has a significant effect on the discharge or potential of pollutants from the facility.

9.4 Signature, Plan Review, and Making Plans Available

U.S. EPA MSGP 2015 5: ***Signature, Plan Review and Making Plans Available.*** 5.2.7 — You must sign and date your SWPPP in accordance with Appendix B, Subsection 11. 5.4 — You must retain a complete copy of your current SWPPP required by this permit at the facility in any accessible format. A complete SWPPP includes any documents incorporated by reference and all documentation supporting your permit eligibility pursuant to Part 1.1 of this permit, as well as your signed and dated certification page. Regardless of the format the SWPPP must be immediately available to facility employees, EPA, a state or tribe, the operator of an MS4 into which you discharge, and representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) at the time of an onsite inspection. Your current SWPPP or certain information from your current SWPPP described below must also be made available to the public (except any confidential business information (CBI) or restricted information [as defined in Appendix A]), but you must clearly identify those portions of the SWPPP that are being withheld from public access; to do so, you must comply with one of the following two options.

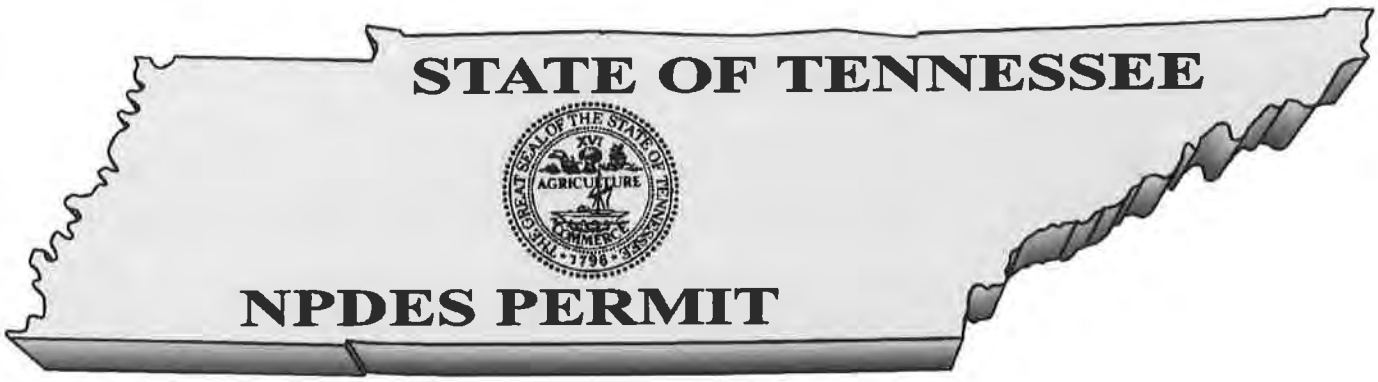
Certifications and reports must be signed as follows: For a corporation: by a responsible corporate officer. For purposes of this section, a responsible corporate officer means (a) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or (b) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

9.5 Record Keeping

The SWPPP, all records and pertinent information resulting from the activities described in this SWPPP, standard operating procedures, review documentation, SWPPP changes, inspection reports, other pertinent examination information, and training/briefing records shall be maintained in a central location and retained by nexAir for a least three years after coverage of this permit terminates. All observations will be documented in a log or a storm event data sheet and maintained onsite with the SWPPP. These reports will be reviewed and initialed by the Plant Manager who will then contact the appropriate personnel if contamination is observed and/or if further action regarding compliance with the SWPPP or improvement of BMPs is required.

The SWPPP must be signed by the Responsible Official and retained until a date three years after the last modification or amendment is made to the SWPPP, and at least one year after coverage under this permit is terminated.

Appendix A
Tennessee Storm Water Multi-Sector General Permit (TNR050000)



TENNESSEE STORM WATER MULTI-SECTOR GENERAL PERMIT FOR INDUSTRIAL ACTIVITIES

PERMIT NO. TNR050000

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the delegation of authority from the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.) and the Water Quality Act of 1987, P.L. 100-4, except as provided in section 1.2.3 below of this stormwater multi-sector general permit, operators of point source discharges of stormwater associated with industrial activity that discharge into waters of the state of Tennessee, represented by the industry sectors identified in part 11 of this permit, are authorized to discharge stormwater runoff associated with industrial activity in accordance with the following stormwater pollution prevention plan requirements, effluent limitations, monitoring and reporting requirements and other provisions as set forth in parts 1 through 11 herein, from the subject facility to waters of the state of Tennessee.

This permit is issued on: **April 14, 2015**

This permit is effective on: **April 15, 2015**

This permit expires on: **April 14, 2020**

Tisha Calabrese Benton
Director

CN-0759

RDA 2366

NPDES GENERAL PERMIT
FOR
STORM WATER DISCHARGES FROM INDUSTRIAL ACTIVITIES

TABLE OF CONTENTS

1. COVERAGE UNDER THIS PERMIT

1.1. Permit Area

The permit is being issued for the State of Tennessee.

1.2. Eligibility

1.2.1. Discharges Covered

Except for stormwater discharges identified under section 1.2.3 below, this permit may cover all new and existing point source discharges of stormwater to waters of the state of Tennessee that are associated with industrial activity identified under the coverage sections contained in part 11. (see Table 1). Military installations must comply with the permit and monitoring requirements for all sectors that describe industrial activities that such installations perform. Similarly, facilities that have "co-located" activities, see subpart 3.4 below, that are described in more than one sector need to comply with applicable conditions of each sector.

Table 1

Stormwater Discharges From:	SIC Codes:	Are Listed in Part:
Timber Products Facilities	2411, 2421, 2426, 2429, 2431- 2439 (except 2434), 2441-2449, 2451, 2452, 2491- 2499	11.A.1.
Paper and Allied Products Manufacturing Facilities	2611, 2621, 2631, 2652 - 2657, 2671, 2672- 2679	11.B.1.
Chemical and Allied Products Manufacturing Facilities	2812- 2819, 2821- 2824, 2841, 2833- 2836, 2842- 2844, 2851, 2861- 2869, 2873- 2879, 2891- 2899. 2911, 3952	11.C.1.
Asphalt Paving, Roofing Materials, and Lubricant Manufacturing Facilities	2951, 2952, 2992	11.D.1.
Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities	3211, 3221, 3229, 3231, 3241, 3251, 3252, 3255, 3259, 3261, 3262, 3263, 3264, 3269, 3271, 3272, 3273, 3274, 3275, 3281, 3285, 3291, 3292, 3295, 3296, 3297, 3299	11.E.1.
Primary Metals Facilities	3312- 3317, 3321-3325, 3331, 3334, 3339, 3341, 3351-3357, 3363 - 3369, 3398, 3399	11.F.1.
Metal Mines (Ore Mining and Dressing) (RESERVED)	(RESERVED)	11.G.1.
Inactive Coal Mines and Inactive Coal Mining-Related Facilities	1221, 1222, 1231, 1241	11.H.1.

Stormwater Discharges From:	SIC Codes:	Are Listed in Part:
Oil or Gas Extraction Facilities	1311, 1321, 1381, 1382, 1389	11.I.1.
Construction Sand and Gravel Mining and Processing and Dimension Stone Mining and Quarrying Facilities	1411, 1422, 1423, 1429, 1442, 1446, 1455, 1459, 1474- 1479, 1481, 1499	11.J.1.
Hazardous Waste Treatment Storage or Disposal Facilities	4953, however, may use main facility's SIC code	11.K.1.
Landfills and Land Application Sites	4953, except for hazardous waste TSD facilities	11.L.1.
Automobile Salvage Yards	5015	11.M.1.
Scrap Recycling and Waste and Recycling Facilities	5093	11.N.1.
Steam Electric Power Generating Facilities	4911	11.O.1.
Vehicle Maintenance or Equipment Cleaning areas at Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, the United States Postal Service, or Railroad Transportation Facilities	4011, 4013, 4111, 4119, 4121, 4131, 4141, 4142, 4151, 4173, 4212, 4213, 4214, 4215, 4221, 4222, 4225, 4226, 4231, 4311, 5171	11.P.1.
Vehicle Maintenance Areas and Equipment Cleaning Areas of Water Transportation Facilities	4412, 4424, 4432, 4449, 4481, 4482, 4489, 4491, 4492, 4493, 4499	11.Q.1.
Ship or Boat Building and Repair Yards	3731, 3732	11.R.1.
Vehicle Maintenance Areas, Equipment Cleaning Areas or From Airport Deicing Operations located at Air Transportation Facilities	4512, 4513, 4522, 4581	11.S.1.
Wastewater Treatment Works	4952	11.T.1.
Food and Kindred Products Facilities	2011, 2013, 2015, 2021, 2022, 2023, 2024, 2026, 2032, 2033, 2034, 2035, 2037, 2038, 2041, 2043, 2044, 2045, 2046, 2047, 2048, 2051, 2052, 2053, 2061, 2062, 2063, 2064, 2066, 2067, 2068, 2074, 2075, 2076, 2077, 2079, 2082, 2083, 2084, 2085, 2086, 2087, 2091, 2092, 2095, 2096, 2097, 2098, 2099, 2111, 2121, 2131, 2141	11.U.1.

Stormwater Discharges From:	SIC Codes:	Are Listed in Part:
Textile Mills, Apparel and other Fabric Product Manufacturing Facilities	2211, 2221, 2231, 2241, 2251, 2252, 2253, 2254, 2257, 2258, 2259, 2261, 2262, 2269, 2273, 2281, 2282, 2284, 2295, 2296, 2297, 2298, 2299, 2311, 2321, 2322, 2323, 2325, 2326, 2329, 2331, 2335, 2337, 2339, 2341, 2342, 2353, 2361, 2369, 2371, 2381, 2384, 2385, 2386, 2387, 2389, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2399, 3131, 3141, 3143, 3144, 3149, 3151, 3161, 3171, 3172, 3199	11.V.1.
Furniture and Fixture Manufacturing Facilities	2434, 2511, 2512, 2514, 2515, 2517, 2519, 2521, 2522, 2531, 2541, 2542, 2591, 2599	11.W.1.
Printing and Platemaking Facilities	2721, 2732, 2741, 2752, 2754, 2759, 2761, 2771, 2782, 2789, 2791, 2796	11.X.1.
Rubber and Miscellaneous Plastic Product Manufacturing Facilities	3011, 3021, 3052, 3053, 3061, 3069, 3081, 3082, 3083, 3084, 3085, 3086, 3087, 3088, 3089, 3931, 3942, 3944, 3949, 3951, 3952, 3953, 3955, 3961, 3965, 3991, 3993, 3995, 3996, 3999	11.Y.1.
Leather Tanning and Finishing Facilities	3111, 3143	11.Z.1.
Facilities That Manufacture Metal Products including Jewelry, Silverware and Plated Ware	3441, 3412, 3421, 3423, 3425, 3429, 3431, 3432, 3433, 3441, 3442, 3443, 3444, 3446, 3448, 3449, 3451, 3452, 3463, 3465, 3466, 3469, 3471, 3479, 3482, 3483, 3484, 3489, 3491, 3492, 3493, 3494, 3495, 3496, 3497, 3498, 3499, 3911, 3914, 3915	11.AA.1.

Stormwater Discharges From:	SIC Codes:	Are Listed in Part:
Facilities That Manufacture Transportation Equipment, Industrial or Commercial Machinery	3511, 3519, 3523, 3524, 3531, 3532, 3533, 3534, 3535, 3536, 3537, 3541, 3542, 3543, 3544, 3545, 3546, 3547, 3548, 3549, 3552, 3553, 3554, 3555, 3556, 3559, 3561, 3562, 3563, 3564, 3565, 3566, 3567, 3568, 3569, 3581, 3582, 3585, 3586, 3589, 3592, 3593, 3594, 3596, 3599, 3711, 3713, 3714, 3715, 3716, 3721, 3724, 3728, 3743, 3751, 3761, 3764, 3769, 3792, 3795, 3799	11.AB.1.
Facilities That Manufacture Electronic and Electrical Equipment and Components, Photographic and Optical Goods	3571, 3572, 3575, 3577, 3578, 3579, 3612, 3613, 3621, 3624, 3625, 3629, 3631, 3632, 3633, 3634, 3635, 3639, 3641, 3643, 3644, 3645, 3646, 3647, 3648, 3651, 3652, 3661, 3663, 3669, 3671, 3672, 3674, 3675, 3677, 3678, 3679, 3691, 3692, 3694, 3695, 3699, 3812, 3813, 3821, 3822, 3823, 3824, 3825, 3826, 3827, 3829, 3841, 3842, 3843, 3844, 3851, 3861, 3873	11.AC.1.
Facilities That Are Not Covered Under Sectors A Thru AC (Monitoring Required)	Varies, may include 9999	11.AD.1.
Facilities That Are Not Covered Under Sectors A Thru AC (Monitoring **Not** Required)	Varies, may include 9999	11.AE.1.
Stormwater Discharges Associated With Industrial Activity From Borrow Pits, Soil Harvesting Sites and Spoil Piles	Varies, may include 9999	11.AF.1.

Although the Office of Management and Budget's North American Industry Classification System is intended to replace the 1987 Standard Industrial Classification (SIC) Code, the EPA decided to continue using the 1987 SIC code system as the primary classification system under this permit because the stormwater regulations (40 CFR 122.26(b) (14)) refer to these codes and because this code system adequately identifies the facilities.

1.2.2. Construction

This permit may authorize stormwater discharges associated with industrial activity that are mixed with stormwater discharges associated with industrial activity from construction

activities, provided that the stormwater discharge from the construction activity is authorized by and in compliance with the terms of a different NPDES (National Pollutant Discharge Elimination System) general permit or individual permit authorizing such discharges.

1.2.3. Limitations on Coverage

The following stormwater discharges associated with industrial activity are not authorized by this permit:

- Storm water discharges associated with industrial activities that are not listed under the coverage sections contained in part 11 (see Table 1 above).
- Storm water discharges associated with industrial activity that are mixed with sources of non-stormwater other than non-stormwater discharges that are:
  - In compliance with a different NPDES permit; or
  - Identified by and in compliance with subpart 3.1 (Prohibition of Non-stormwater Discharges) of this permit.
- Storm water discharges associated with industrial activity that are subject to an existing NPDES individual or general permit.
- Are located at a facility where an NPDES permit has been issued in accordance with subpart 7.11 (Requiring an Individual Permit or an Alternative General Permit) of this permit.
- Storm water discharges associated with industrial activity that the Division of Water Resources (the division) has determined to be or may reasonably be expected to be contributing to a violation of a water quality standard.
- Discharges subject to stormwater effluent guidelines, not described under part 11.
- Storm water discharges associated with industrial activity from inactive mining, inactive landfills, or inactive oil and gas operations occurring on Federal lands where an operator cannot be identified.
- Discharges Negatively Affecting a Property on the National Historic Register – Industrial stormwater discharges that would negatively affect a property that is listed or is eligible for listing in the National Historic Register maintained by the Secretary of Interior.
- Discharges into Outstanding National Resource Waters – The director shall not grant coverage under this permit for discharges into waters that are designated by the Water Quality Control Board as Outstanding National Resource Waters (ONRWs) Designation of ONRWs are made according to TDEC Rules, Chapter 0400-40-3-.06.
- Discharges into Exceptional Tennessee Waters – The director shall not grant coverage under this permit for potential discharges of pollutants, which would cause degradation to waters designated by TDEC as Exceptional Tennessee waters. Identification of Exceptional Tennessee waters is made according to TDEC Rules, Chapter 0400-40-3-.06.
- Discharges to waters with unavailable parameters:

  Any operator who intends to obtain authorization under the TMSP for all new and existing stormwater discharges to waters with unavailable parameters, or discharges upstream of waters impaired by the same parameter, that may affect the waters with unavailable parameters, from facilities where there is a reasonable potential to contain pollutants for which the receiving water is impaired, must satisfy the following conditions prior to the authorization:

1 Requirements for New Discharges or Existing Discharges Proposing an Increase of Pollutant Loading

Prior to the division's granting coverage under the TMSP, the operator shall provide an estimate of pollutant loads in stormwater discharges from the facility to the division. This estimate shall include the documentation upon which the estimate is based (e.g., sampling data from the facility, sampling data from substantially identical outfalls at similar facilities, modeling, etc.). Existing facilities should base this estimate on actual analytical data, if available. This information shall be submitted in writing to the division (see subpart 2.3: Where to Submit) at least 90 days prior to commencement of proposed industrial activities at the site.

If a Total Maximum Daily Load (TMDL) has been approved, permit coverage is available only if the operator has received notice from the division confirming eligibility.

Following receipt of the information regarding an estimate of pollutant loads, the division anticipates using the following process in making eligibility determinations for new discharges into waters that do not meet their designated classified use where a TMDL has been developed:

- The division will notify the facility operator that the estimated pollutant load is consistent with the TMDL and that the proposed stormwater discharges meet the eligibility requirements of the TMSP and may be authorized under this permit; or
- The division will notify the facility operator and EPA that the estimated pollutant load is not consistent with the TMDL and that the proposed stormwater discharges do not meet the eligibility requirements of the TMSP and cannot be authorized under this NPDES permit.

If a Total Maximum Daily Load (TMDL) has not been approved, permit coverage for new discharges or existing discharges proposing an increase of pollutant loading is not available under this permit for discharges to waters with unavailable parameters and the operator must seek coverage under a separate (individual) permit.

2 Requirements for Existing Discharges

If a Total Maximum Daily Load (TMDL) has been approved, permit coverage is available only if the operator has received notice from the division confirming eligibility.

If a TMDL has been approved, the division will require the operator to provide an estimate of pollutant loads in stormwater discharges from the facility. This estimate must include the documentation upon which the estimate is based (e.g., sampling data from the facility, sampling data from substantially identical outfalls at similar facilities, modeling, etc.). Facilities with existing discharges must base this estimate on actual analytical data, if available.

The division anticipates using the following process in making eligibility determinations for existing discharges into waters with unavailable parameters where a TMDL has been approved:

- the division will notify the facility operator that the estimated pollutant load is consistent with the TMDL and that the proposed stormwater discharges meet the eligibility requirements of the TMSP and may be authorized under this NPDES permit; or
- the division will notify the facility operator that the estimated pollutant load is not consistent with the TMDL and that the proposed stormwater discharges do not meet the eligibility requirements of the TMSP and cannot be authorized under this NPDES permit.

If a Total Maximum Daily Load (TMDL) has not been approved at the time of permit authorization, coverage under this permit is available only if the pollutant loading from existing facilities remains unchanged or is reduced as a result of additional pollution prevention measures as identified in the facility's Stormwater Pollution Prevention Plan (SWPPP).

If a TMDL is approved during the term of this permit and identifies existing permitted discharges as having a reasonable potential to contain pollutants for which the receiving water has unavailable parameters, these discharges shall no longer be authorized by this permit unless, following notification by the division:

- The operator completes revisions to the Stormwater Pollution Prevention Plan (SWPPP) to include additional and/or modified Best Management Practices (BMPs) designed to comply with any applicable Waste Load Allocation (WLA) established for facility discharges within 30 calendar days following notification by the division; and
- The operator implements the additional and/or modified BMPs not requiring construction within 60 days;
- In cases where construction is necessary, the SWPPP shall contain a schedule that provides compliance with the SWPPP as expeditiously as practicable, but no later than 1 years following notification by the division; and
- A report is submitted to the division, which documents actions taken to comply with this condition, including estimated pollutant loads, within 90 calendar days following implementation of the additional and/or modified BMPs.

Additional Monitoring for Existing Discharges to Waters with Unavailable Parameters

The permittee shall perform analytical monitoring for each outfall at least quarterly for any pollutant(s) for which the water has unavailable parameters where there is a reasonable potential for discharges to contain any or all of these pollutants (i.e. the pollutant is listed in the Monitoring and Reporting Requirements part of the applicable sector or the facility has knowledge that a pollutant of concern is present at the facility and exposed to stormwater). Monitoring results should be submitted to the division using the stormwater

monitoring report (see Reporting: Where to Submit) within 45 calendar days following sample collection. These monitoring requirements are not eligible for any waivers listed elsewhere in the permit.

1.2.4. Stormwater Not Associated With Industrial Activity

Storm water discharges associated with industrial activity that are authorized by this permit may be combined with other sources of stormwater that are not classified as associated with industrial activity pursuant to 40 CFR 122.26(b)(14).

1.2.5. Threatened and Endangered Species Protection

a) Issuance of a Notice of Coverage (NOC) under this permit will constitute confirmation of the division's finding that, with properly developed and implemented SWPPP, the discharges authorized hereunder are not likely to result in the taking of threatened and endangered species.

b) Should the division later determine that the discharges covered by this permit would result in the taking of threatened or endangered species, or are otherwise not in compliance with the Endangered Species Act, the director, after written notification to the permittee, shall either:

i. Notify the permittee that it is no longer eligible for coverage under this permit and require coverage under an individual NPDES permit. The permittee will continue to be covered under this permit until the division issues an individual NPDES permit, provided a timely application for an individual permit is made. A timely application is defined as submitting to the division a complete permit application, including sampling, within 90 days of the notice from the director requiring the application. A permittee may request a later date for the timely submission of an individual NPDES permit application for just cause; or

ii. Notify the permittee that it must modify its SWPPP such that as a consequence, the discharges authorized by this permit will not result in the taking of threatened and endangered species and otherwise be in compliance with the Endangered Species Act. The permittee shall have 60 days after such notice to make such modifications to the SWPPP, and then 12 weeks to implement these modifications, unless the permittee justifies to the division that a longer time is necessary for their implementation. Should a longer time be required, the permittee shall submit to the division's local Environmental Field Office (see list of EFOs under subpart 3.3 on page 14 of this permit) a brief summary of the proposed modifications of SWPPP, including a timetable for implementation.

1.3. Authorization

Dischargers of stormwater associated with industrial activity must submit a complete Notice of Intent (NOI) in accordance with the requirements of part 2 of this permit, using a NOI form as found in **Addendum B** (or a copy thereof), to be authorized to discharge under this general permit. The division will send to the permittee a written Notice of Coverage (NOC), informing the permittee that the NOI was received and stormwater discharges from the industrial activity have been approved under this general permit. The operator is authorized to discharge stormwater associated with the industrial activity as of the effective date on the

division prepared NOC. A copy of the NOC shall be kept on site. The division may deny coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI or other information.

Assigning a permit tracking number by the division to a proposed stormwater discharge does not confirm or imply an authorization to discharge under this permit. Correspondence with the permittee is maintained through the primary contact person listed on the NOI.

1.4. Permit Eligibility Regarding Protection of Water Quality Standards and Compliance with State Anti-degradation Requirements

Pursuant to the Rules of the Tennessee Department of Environment and Conservation (the department), Chapter 0400-40-3-.06, titled "Tennessee Antidegradation Statement," and in consideration of the department's directive in attaining the greatest degree of effluent reduction achievable in municipal, industrial, and other wastes, the permittee shall further be required, pursuant to the terms and conditions of this permit, to comply with any applicable Waste Load Allocations (WLA), effluent limitations, and schedules of compliance, required to implement applicable water quality standards, to comply with a State Water Quality Plan or other State or Federal laws or regulations, or where practicable, to comply with a standard permitting no discharge of pollutants. Additional Stormwater Pollution Prevention Plan (SWPPP) requirements, as described in subpart 4.6, are applicable to new discharges and discharges which constitute an increase of pollutant loading for discharges to waters identified by the department as Exceptional Tennessee waters, or discharges upstream of Exceptional Tennessee waters, that may affect the Exceptional Tennessee waters.

1.5. Overview of the Multi-Sector General Permit

Parts 1 through 10 of this general permit apply to all industrial facilities. Parts 1 and 2 describe eligibility requirements and the process for obtaining permit coverage. Parts 3 through 10 contain "basic" permit requirements.

part 11 provides additional requirements for particular sectors of industrial activity. For example, primary metal facilities adds subpart 11.F. to the "universal" parts 1 through 10 requirements.

Some facilities may have "co-located" activities that are described in more than one sector and need to comply with applicable conditions of each sector. For example, a chemical manufacturing facility could have a land application site and be subject to subpart 11.C. - Chemical and Allied products Manufacturing sector (primary activity), with runoff from the land application site (co-located activity) also subject to conditions in subpart 11.L. - Landfills and Land Application Sites.

2. NOTIFICATION REQUIREMENTS

2.1. Deadlines for Notification

2.1.1. Existing Facility

Except as provided in sections 2.1.4 (New Operator), and 2.1.5 (Late Notification), individuals who intend to obtain coverage for an existing stormwater discharge associated

with industrial activity under this general permit shall submit an NOI in accordance with the requirements of this part not more than 30 days following the effective date of this permit.

2.1.2. New Facility

For a new facility, an NOI shall be submitted at least 7 days prior to the commencement of any industrial activity, except as provided in sections 2.1.3 (Oil and Gas Operations), 2.1.4 (New Operator), and 2.1.5 (Late Notification).

2.1.3. Oil and Gas Operations

Operators of oil and gas exploration, production, processing, or treatment operations or transmission facilities, that were not required to submit a permit application as of May 31, 1997 in accordance with 40 CFR 122.26(c)(1)(iii), but that after May 31, 1997 have a discharge of a reportable quantity of oil or a hazardous substance for which notification is required pursuant to either 40 CFR 110.6, 40 CFR 117.21, or 40 CFR 302.6, must submit an NOI in accordance with the requirements of this permit within 14 calendar days of the first knowledge of such release.

2.1.4. New Operator

Where the operator of a facility with a stormwater discharge associated with industrial activity that is covered by this permit changes, the new operator of the facility must submit an NOI in accordance with the requirements of this part at least 5 days prior to the change.

2.1.5. Late Notification

An operator of a stormwater discharge associated with industrial activity is not precluded from submitting an NOI in accordance with the requirements of this part after the dates provided in sections 2.1.1, 2.1.2, 2.1.3, or 2.1.4 of this permit.

2.2. Contents of Notice of Intent

The NOI shall be signed in accordance with subpart 7.7 (Signatory Requirements) of this permit and shall include the following information:

2.2.1. Change of Operator

Whether this NOI is being submitted due to a change in the operator or to update facility information (such as a name of facility, new contact, E-mail address, etc.) of a facility which is currently covered under the Tennessee Stormwater Multi-Sector General Permit for Industrial Activities, the former or the current operator’s permit tracking number;

2.2.2. Facility Identification and Location Information

The legal and official name of the facility, and the address or description of location of the facility, the name of county the facility is located, facility latitude and longitude, as well as a copy of a U.S.G.S. topographical map, a city map, or a county map, identifying the location of the facility;

2.2.3. Facility Operator

The name of the person, firm, organization, or other entity, which owns and/or operates the subject facility; the name, title or position, mailing address and E-mail of an official contact person, as well as the facility contact person (i.e. local contact, if applicable) and an indication of the mailing address where correspondence should be sent;

2.2.4. Receiving Water and Outfall Information

Number of stormwater outfalls at the facility; for each outfall, names and stream miles or location(s) of the receiving stream(s) and/or lake(s);

2.2.5. Industrial Information

The SIC (Standard Industrial Classification) code(s) for the facility (primary, secondary-if applicable-etc.), a brief description of the nature of the business at the facility, and an indication of which activities are occurring at the facility; area of property associated with industrial activity in acres (Please note that area of facility property should not include recreation areas, landscaping, lawns, greenfields, forest, office buildings, employee parking lots, etc.);

2.2.6. Certification and Signature

The following certification shall be signed in accordance with subpart 7.7:

> *I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the site, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.*

2.2.7. Pollution Prevention Plan Preparation and Implementation

All new and existing facilities that request coverage under this permit must have a stormwater pollution prevention plan (SWPPP) prepared and implemented in accordance with part 4 of this permit, prior to NOI submittal. For those permittees switching coverage from the expiring TMSP, existing SWPPPs will satisfy the requirement to have a plan developed before the NOI is signed, when modified as necessary in accordance with section 4.1.4. Do not include a copy of the SWPPP with the NOI submission, except as required by subpart 4.6 of this permit.

2.3. Where to Submit

Facilities that discharge stormwater associated with industrial activity must use an NOI form provided by the division (or a copy thereof). NOIs must be signed in accordance with subpart

7.7 below (Signatory Requirements) of this permit. NOIs are to be submitted to the division at the following address:

Stormwater NOI Processing
Division of Water Resources
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243

2.4. Electronic Submission of NOIs

The division supports and encourages submission of electronic documents (e.g., scanned NOIs submitted as PDF files) by using a dedicated email address:

Water.Permits@tn.gov

If the division notifies dischargers (directly by mail or E-mail, by public notice, or by making information available on the Internet) of other NOI form options that become available at a later date (e.g., direct online submission of forms), the permittees may take advantage of those options to satisfy the NOI notification requirements.

3. SPECIAL CONDITIONS

3.1. Prohibition of Non-stormwater Discharges

3.1.1. Stormwater Discharges

All discharges covered by this permit shall be composed entirely of stormwater except as allowed in section 3.1.2 below.

3.1.2. Allowable Non-Stormwater Discharges

Discharges of material other than stormwater must be in compliance with an NPDES permit (other than this permit and as listed below) issued for the discharge. This permit authorizes the following non-stormwater discharges:

- Fire hydrant flushings;
- Potable water including water line flushings;
- Uncontaminated air conditioning or compressor condensate;
- Irrigation drainage;
- Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with manufacturer's instructions;
- Washing of sidewalks, buildings, etc. to which no detergents have been added; wash water should also be free of any other pollutants such as sediment, debris, etc.
- Uncontaminated ground water or spring water;
- Foundation or footing drains where flows are not contaminated with process materials such as solvents;
- Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of your facility, but NOT intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains).

- Discharges from wet deck storage areas, which are authorized only if no chemical additives are used in the spray water or applied to the logs.

The facility's SWPPP shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the onsite drainage points that were directly observed during the test. Certifications shall be signed in accordance with subpart 7.7. of this permit.

3.2. Releases in Excess of Reportable Quantities

3.2.1. Hazardous Substances or Oil

The discharge of hazardous substances or oil in the stormwater discharge(s) from a facility shall be prevented or minimized in accordance with the applicable SWPPP for the facility. This permit does not relieve the permittee of the reporting requirements of 40 CFR Part 117 and 40 CFR Part 302. Except as provided in section 3.2.2 (Multiple Anticipated Discharges) of this permit, where a release containing a hazardous substance in an amount equal to or in excess of a reporting quantity established under either 40 CFR Part 117 or 40 CFR Part 302, occurs during a 24-hour period:

- The discharger is required to notify the National Response Center (NRC) at 1-800-424-8802, the Tennessee Emergency Management Agency (TEMA) at 1-800-262-3300 or (615) 741-0001, and the appropriate division's Environmental Field Office (see list of EFOs under subpart 3.3 on page 14 of this permit), in accordance with the requirements of 40 CFR Part 117 and 40 CFR Part 302, as soon as he or she has knowledge of the discharge;

- The SWPPP required under part 4 (Stormwater Pollution Prevention Plans) of this permit must be modified within 14 calendar days of knowledge of the release to provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the SWPPP must be reviewed by the permittee to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the SWPPP must be modified where appropriate; and

- The permittee shall submit within 14 calendar days of knowledge of the release a written description of the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, and steps to be taken in accordance with this section (3.2.1 above) of this permit to the appropriate division's Environmental Field Offices (see list of EFOs under subpart 3.3 on page 14 of this permit).

3.2.2. Multiple Anticipated Discharges

Facilities that have more than one anticipated discharge per year containing the same hazardous substance in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 117 or 40 CFR Part 302, that occurs during a 24-hour period, where

the discharge is caused by events occurring within the scope of the relevant operating system shall:

- Submit notifications in accordance with section (3.2.1 above) of this permit for the first such release that occurs during a calendar year (or for the first year of this permit, after submittal of an NOI); and

- Shall provide in the SWPPP required under part 4 (Stormwater Pollution Prevention Plans) a written description of the dates on which all such releases occurred, the type and estimate of the amount of material released, and the circumstances leading to the releases. In addition, the SWPPP must be reviewed to identify measures to prevent or minimize such releases and the SWPPP must be modified where appropriate.

3.2.3. Spills

This permit does not authorize the discharge of hazardous substances or oil resulting from an onsite spill.

3.3. List of the Division's Environmental Field Offices (EFOs) and Counties

EFO Name	EFO Address	List of Counties
Chattanooga	Division of Water Resources 1301 Riverfront Parkway, Suite #206 Chattanooga, TN 37402 (423) 634-5745	Bledsoe, Bradley, Grundy, Hamilton, McMinn, Marion, Meigs, Polk, Rhea, Sequatchie
Columbia	Division of Water Resources 1421 Hampshire Pike Columbia, TN 38401 (931) 380-3371	Bedford, Coffee, Franklin, Giles, Hickman, Lawrence, Lewis, Lincoln, Marshall, Maury, Moore, Perry, Wayne
Cookeville	Division of Water Resources 1221 South Willow Ave Cookeville, TN 38506 (931) 432-4015	Cannon, Clay, DeKalb, Fentress, Grundy, Jackson, Macon, Overton, Pickett, Putnam, Smith, Trousdale, Van Buren, Warren, White
Jackson	Division of Water Resources 1625 Hollywood Dr Jackson, TN 38305 (731) 512-1300	Benton, Carroll, Chester, Crockett, Decatur, Dyer, Gibson, Hardeman, Hardin, Haywood, Henderson, Henry, Lake, Lauderdale, McNairy, Madison, Obion, Weakly
Johnson City	Division of Water Resources 2305 Silverdale Rd Johnson City, TN 37601 (423) 854-5400	Carter, Greene, Hancock, Hawkins, Johnson, Sullivan, Unicoi, Washington Counties
Knoxville	Division of Water Resources 3711 Middlebrook Pike Knoxville, TN 37921 (865) 594-6035	Anderson, Blount, Campbell, Claiborne, Cocke, Cumberland, Grainger, Hamblen, Jefferson, Knox, Loudon, Monroe, Morgan, Roane, Scott, Sevier, Union
Memphis	Division of Water Resources 8383 Wolf Lake Drive Bartlett, TN 38133 (901) 371-3000	Fayette, Shelby, Tipton

EFO Name	EFO Address	List of Counties
Nashville	Division of Water Resources 711 R.S. Gass Boulevard Nashville, TN 37206 (615) 681-7000	Cheatham, Davidson, Dickson, Houston, Humphreys, Montgomery, Robertson, Rutherford, Stewart, Sumner, Williamson, Wilson

All Environmental Field Offices (EFOs) may be reached by telephone at the toll-free number 1-888-891-8332 (TDEC).

3.4. Co-located Industrial Activity

In the case where a facility has industrial activities occurring onsite which are described by any of the activities in other sections of part 11 of this permit, those industrial activities are considered to be co-located industrial activities. A facility with a primary industrial activity that is required to obtain coverage under TMSP is also required to comply with requirements that apply to other activities at the facility if those additional activities would require coverage if considered on their own. There may be specific monitoring and SWPPP requirements associated with each industrial sector. Permittees must comply with all requirements related to each activity. The operator of the facility shall determine which additional pollution prevention plan and monitoring requirements are applicable to the co-located industrial activity by examining the narrative descriptions of each coverage section (Discharges Covered Under This Section) in part 11 of this permit. Provisions under this part are applicable on an outfall-specific basis.

4. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A stormwater pollution prevention plan (SWPPP) shall be developed for each facility covered by this permit. SWPPPs shall be prepared in accordance with good engineering practices and in accordance with the factors outlined in 40 CFR 125.3(d)(2) or (3) as appropriate. The SWPPP shall identify potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges associated with industrial activity from the facility. In addition, the SWPPP shall describe and ensure the implementation of practices that are to be used to minimize the pollutants in stormwater discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. The term ‘minimize’ means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practice. Facilities must implement the provisions of the SWPPP required under this part as a condition of this permit. For additional information to assist permittees in complying with these permit conditions and in the preparation of the SWPPP, see Addendum C (List of Applicable References).

4.1. Deadlines for Plan Preparation and Compliance

4.1.1. Existing Facilities

Except as provided in sections 4.1.3, 4.1.4 and 4.1.5 (below), all facilities seeking coverage under the new TMSP who were previously covered by the expiring TMSP shall continue to implement the SWPPP developed under the expiring permit. The SWPPP shall be modified to address additional requirements in the new permit no later than 60 days following the effective date of this permit. The revisions made to the SWPPP shall be implemented within 180 days following the effective date of this permit, except where new construction is

required, in which case the construction must be completed within 1 year following the effective date of this permit.

4.1.2. New Facilities

Except as provided in sections 4.1.3, 4.1.4 and 4.1.5 (below), all new facilities shall prepare and implement their SWPPP prior to submitting the Notice of Intent. A copy of the SWPPP shall be submitted with the Notice of Intent, preferably in electronic format (PDF).

4.1.3. Oil and Gas Operations

Oil and gas exploration, production, processing or treatment operations or transmission facilities that are not required to submit a permit application on or before May 31, 1997, in accordance with 40 CFR 122.26(c)(1)(iii), but after May 31, 1997, have a discharge of a reportable quantity of oil or a hazardous substance for which notification is required pursuant to either 40 CFR 110.6, 40 CFR 117.21 or 40 CFR 302.6, shall prepare and implement the SWPPP on or before the date 60 calendar days after first knowledge of such release.

4.1.4. Facilities Switching from Coverage Under an Individual NPDES permit to this General Permit

Facilities previously subject to an individual NPDES permit that switch to coverage under this permit shall continue to implement the SWPPP required by that permit. The SWPPP shall be revised as necessary to address requirements under part 11 of this permit no later than 180 days following the switch to this general permit. The revisions made to the SWPPP shall be implemented on or before 1 year following the date of the switch. The antibacksliding provisions, as contained in Section 402(o) of the Clean Water Act and codified in the NPDES regulations at 40 CFR §122.44 (l) - *Reissued permits*, shall apply to the facilities previously subject to an individual NPDES permit that switch to coverage under this permit.

4.1.5. Measures That Require Construction

In cases where construction is necessary, the SWPPP shall contain a schedule that provides compliance with the SWPPP as expeditiously as practicable, but no later than 2 years following the effective date of this permit. Where a construction compliance schedule is included in the SWPPP, the schedule shall include appropriate non-structural and/or temporary controls to be implemented in the affected portion(s) of the facility prior to completion of the permanent control measure.

Operators of construction sites involving clearing, grading or excavation that results in an area of disturbance of one or more acres, and activities that result in the disturbance of less than one acre if it is part of a larger common plan of development or sale must obtain coverage under the Construction General Permit.

4.1.6. Extensions

Upon a showing of good cause, the division may establish a later date in writing for preparing and compliance with a SWPPP for a stormwater discharge associated with industrial activity.

4.2. Signature and Plan Review

4.2.1. Signature/Location

The SWPPP shall be signed in accordance with subpart 7.7 (Signatory Requirements), and be retained onsite at the facility that generates the stormwater discharge in accordance with section 7.14.2 (Retention of Records) of this permit. For inactive facilities, the SWPPP may be kept at the nearest office of the permittee.

4.2.2. Availability

Except as provided in section 4.1.2 – New Facilities (above), the permittee shall make the NOC, SWPPP, annual site compliance inspection report, or other information available upon request to the division; the EPA; the U.S. Fisheries and Wildlife Service Regional Director; the Tennessee Wildlife Resources Agency; or authorized representatives of these officials. A copy of these documents shall be located at the facility.

4.2.3. Required Modifications

The director of the Division of Water Resources, or authorized representative, may notify the permittee at any time that the SWPPP does not meet one or more of the minimum requirements of this part. Such notification shall identify those provisions of the permit that are not being met by the SWPPP, and identify which provisions of the SWPPP require modification in order to meet the minimum requirements of this part. Within 60 days of such notification from the director, (or as otherwise provided by the division), or authorized representative, the permittee shall make the required changes to the SWPPP and shall submit to the division a written certification that the requested changes have been made.

4.3. Keeping Plans Current

The permittee shall amend the stormwater pollution prevention plan (SWPPP) annually or as follows:

- Whenever there is a change in design, construction, operation, or maintenance, that has a significant effect on the potential for the discharge of pollutants to the waters of the state;
- If the SWPPP proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified under subpart 4.4 (Contents of the Plan) of this permit; or
- If the SWPPP proves to be ineffective in otherwise achieving the general objectives of controlling pollutants in stormwater discharges associated with industrial activity.

In addition, the permittee shall evaluate the results obtained from sampling and monitoring pursuant to the Monitoring and Reporting Requirements applicable to each sector of this permit. The evaluation should be done following the required annual sampling events to determine whether the facility is below, meets, or exceeds the monitoring benchmarks as shown in part 11 for that particular industry. If the results of annual stormwater runoff monitoring demonstrate that the facility has exceeded the benchmark(s), the permittee must inform the division's local Environmental Field Office (EFO) in writing, within 30 days from the time stormwater monitoring results were received, describing the likely cause of the exceedance(s). Furthermore, within 60 days from the time stormwater monitoring results were received, the facility must:

- Review its SWPPP, make any modifications or additions to the SWPPP which would assist in reducing specific effluent concentrations which are equal to less than the monitoring benchmarks for that facility, and
- Submit to the division's local EFO a brief summary of the proposed SWPPP modifications (including a timetable for implementation).

In the event of a repeated benchmark exceedance, the permittee can, in consultation with the division, make a determination that no further pollutant reduction is technologically available, economically practicable and achievable in light of best industry practices. The permittee must document the rationale for concluding that no further pollutant reductions are achievable, and retain all records related to this documentation with the SWPPP.

New owners shall review the existing SWPPP and make appropriate changes using the same timetable as described above. Amendments and modifications to the SWPPP may be reviewed by the division in the same manner as in subpart 4.2.

4.4. Contents of the Plan

The contents of the SWPPP shall comply with the requirements listed in the appropriate subpart (sector) of part 11 (Specific Requirements for Industrial Activities). These requirements are cumulative. If a facility has co-located activities that are covered in more than one subpart (sector) of part 11, that facility's SWPPP must comply with the requirements listed in all applicable subparts (sectors) of this permit.

4.5. Additional Pollution Prevention Plan Requirements

In addition to the minimum standards listed in part 11 of this permit (Specific Requirements for Industrial Activities), the SWPPP shall include a complete discussion of measures taken to conform with the following applicable guidelines, other effective stormwater pollution prevention procedures, and applicable State rules, regulations and guidelines:

4.5.1. Additional Requirements for Stormwater Discharges Associated With Industrial Activity that Discharge Into or Through Permitted Municipal Separate Storm Sewer Systems (MS4)

In addition to the applicable requirements of this permit, facilities covered by this permit must comply with applicable requirements in municipal stormwater management programs developed under NPDES permits issued for the discharge of the municipal separate storm sewer system (MS4) that receives the facility's discharge, provided the discharger has been notified of such conditions.

Permittees that discharge stormwater associated with industrial activity through a MS4, or a municipal system designated by the division, shall make SWPPPs available to the municipal operator of the system upon request.

Coverage under the TMSP does not serve to waive any required/applicable local floodplain protection permitting requirements.

Off-site vehicle tracking of significant materials and the generation of dust shall be minimized. A stabilized site access (a point of entrance/exit to a facility) shall be described and implemented, as needed, to reduce the tracking of significant materials onto public roads

by construction vehicles. Facilities cannot use the public roadways/right-of-ways or MS4 as their primary, ongoing site exit control.

4.5.2. Additional Requirements for Stormwater Discharges Associated With Industrial Activity from Facilities Subject to Emergency Planning and Community Right to Know Act (EPCRA) Section 313 Requirements

Potential pollutant sources for which you have reporting requirements under EPCRA 313 must be identified in your risk identification and summary of potential pollutant sources determination as required under each industrial sector in this permit. Note this requirement only applies to you if you are subject to reporting requirements under EPCRA 313.

4.5.3. Additional Requirements for Salt Storage

Storage piles of salt used for deicing or other commercial or industrial purposes and that generate a stormwater discharge associated with industrial activity that is discharged to waters of the state shall be enclosed or covered to prevent exposure to precipitation, except for exposure resulting from adding or removing materials from the pile. Dischargers shall be compliant with this provision upon submittal of the NOI. Piles do not need to be enclosed or covered where stormwater from the pile is not discharged to waters of the state.

4.5.4. Consistency with Other Plans

SWPPPs may reference the existence of other plans for Spill Prevention Control and Countermeasure (SPCC) plans developed for the facility under Section 311 of the CWA or Best Management Practices (BMP) Programs otherwise required by an NPDES permit for the facility as long as such requirement is incorporated into the SWPPP.

4.5.5. Use of Pavement Sealant Products

Use of asphalt-based instead of tar-based pavement sealant products is encouraged to minimize discharge of PAHs from industrial facilities. Additionally, painting is not recommended under wet weather conditions.

4.6. Additional Stormwater Pollution Prevention Plan (SWPPP) requirements for discharges into waters with unavailable parameters or Exceptional Tennessee waters

If the division has notified the facility operator that the estimated pollutant load is consistent with the TMDL and that the proposed stormwater discharges meet the eligibility requirements of the TMSP and may be authorized under this permit, additional SWPPP requirements shall apply. Additional SWPPP requirements for discharges into waters with unavailable parameters for a parameter present in the facility's stormwater runoff, or discharges upstream of waters impaired by the same parameter, that may affect the waters with unavailable parameters; and for discharges to waters identified by the department as Exceptional Tennessee waters, or discharges upstream of Exceptional Tennessee waters, that may affect the Exceptional Tennessee waters, are as follows:

The SWPPP shall be submitted to the appropriate division's Environmental Field Office (see list of EFOs under subpart 3.3 on page 14). This SWPPP may be submitted with the NOI, but must be submitted prior to commencement of new industrial activities, or a change of industrial activity that would cause an increase of pollutant loading from the site into waters with unavailable parameters or Exceptional Tennessee waters.

The permittee shall perform, at a minimum, monthly inspections.

The monthly inspection shall be conducted by the qualified personnel who shall inspect the areas of facility used for storage of significant materials that are exposed to precipitation, as well as structural and non-structural control measures at the site. Areas used for storage of significant materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system (and potentially waters of the state). Outfall points (where discharges from the site enter into the waters with unavailable parameters or Exceptional Tennessee waters) shall be inspected (including, but not limited to, visual observations) to determine whether structural and non-structural control measures are effective in preventing significant impacts to receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected if possible.

Based on the results of the inspection, any inadequate control measures or control measures in disrepair shall be replaced or modified, or repaired as necessary, before the next rain event if possible, but in no case more than seven days after the need is identified. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable.

Based on the results of the inspection, the facility description and pollution prevention measures identified in the SWPPP shall be revised as appropriate, but in no case later than 14 calendar days following the inspection. Such modifications shall provide for timely implementation of any changes to the SWPPP in no case later than 60 calendar days following the inspection.

Inspections shall be documented and include the scope of the inspection, name(s) and title or qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the stormwater pollution prevention plan (including the location(s) of discharges of pollutants from the site and of any control device that failed to operate as designed or proved inadequate for a particular location), and actions taken to prevent further discharge of pollutants from the site.

The permittee must certify on a quarterly basis that inspections of structural and non-structural control measures and of outfall points were performed and whether or not all planned and designed pollution prevention controls measures are installed and in working order. The certification must be done by a person who meets the signatory requirements of this permit. The certification should be kept with the facility's SWPPP, shall be signed in accordance with subpart 7.7 (Signatory Requirements) of this permit and has to be submitted to the local Environmental Field Office upon request.

If the division finds that a discharge is causing a violation of water quality standards or causing or contributing to the impairment of a known water with unavailable parameters or any water, and finds that the discharger is complying with SWPPP requirements of this permit, the discharger will be notified by the director in writing that the discharge is no longer eligible for coverage under the general permit and that continued discharges must be covered

by an individual permit. To obtain the individual permit, the operator must file an individual NPDES permit application.

5. NUMERIC EFFLUENT LIMITATIONS

5.1. Discharges Associated With Specific Industrial Activity

Numeric effluent limitations for stormwater discharges associated with a specific industrial activity are described in part 11 of this permit.

5.2. Coal Pile Runoff

Any stormwater discharge composed of coal pile runoff shall not exceed a maximum concentration for any time of 50 mg/L total suspended solids (TSS). Coal pile runoff shall not be diluted with stormwater or other flows in order to meet this limitation. The pH of such discharges shall be within the range of 6.0 to 9.0. Runoff from coal piles shall be compliant with this provision upon submittal of the NOI. Any untreated overflow from facilities designed, constructed and operated to treat the volume of coal pile runoff that is associated with a 10-year, 24-hour rainfall event shall not be subject to the 50 mg/L limitation for total suspended solids.

6. MONITORING AND REPORTING REQUIREMENTS

6.1. Monitoring Requirements

6.1.1. Limitations on Monitoring Requirements

Those facilities with discharges or activities identified in subpart 6.4 and part 11 are required to conduct sampling of their stormwater discharges associated with industrial activity. Monitoring requirements under subpart 6.4 and part 11 are additive. Facilities with discharges or activities described in more than one monitoring section are subject to all applicable monitoring requirements from each section.

The director can provide written notice to any facility otherwise exempt from the sampling requirements of subpart 6.4 and part 11 that it shall conduct discharge sampling for a specific monitoring frequency for specific parameters.

6.1.2. Additional Monitoring by the Permittee

If the permittee monitors any pollutant required to be monitored by this permit more frequently than required in subpart 6.4 and part 11, using approved analytical methods as specified herein, the results of such monitoring shall be included in the calculation and reporting of the values required in the TMSP Stormwater Monitoring Report form. Such increased frequency shall also be indicated on the form.

6.2. Reporting: Where to Submit

One signed copy of the Annual Stormwater Monitoring Report (see Addendum D) for the benchmark results or the Discharge Monitoring Report (DMR) (see Addendum E) for effluent numeric limitations results required under parts 11 and all other stormwater

monitoring reports required herein, shall be submitted to the division at the appropriate EFO for the county where the facility is located. A list of EFOs and their addresses are available in subpart 3.3 above.

Mining and Quarrying facilities only (Sectors J and H of part 11) should submit one signed copy of Annual Stormwater Monitoring Report (see Addendum D) required under part 11, and all other reports required herein, to the division's Mining Unit at the following address:

Tennessee Division of Water Resources
Mining Unit
3711 Middlebrook Pike
Knoxville, TN 37921

For each outfall, one Annual Stormwater Monitoring Report (see Addendum D) form must be submitted.

6.3. Electronic Submission of Reports

The division supports and encourages submission of electronic documents (e.g., scanned reports submitted as PDF files) by using a dedicated email address:

Water.Permits@tn.gov

If the division notifies dischargers (directly by mail or E-mail, by public notice, or by making information available on the Internet) of other Annual Stormwater Monitoring Reports (see Addendum D) required under part 11, and all other stormwater monitoring reports options that become available at a later date (e.g., electronic submission of forms or letters), the permittees may take advantage of those options to satisfy the reporting requirements.

6.4. Special Monitoring Requirements for Coal Pile Runoff

During the period beginning on the effective date and lasting through the expiration date of this permit, permittees with stormwater discharges containing coal pile runoff shall monitor such stormwater for pH and TSS (mg/L) at least annually (1 time per year). Permittees with discharges containing coal pile runoff must report in accordance with subpart 5.2 (Coal Pile Runoff - Numeric Effluent Limitations) and subpart 6.2 (Reporting: Where to Submit). In addition to the parameters listed above, the permittee shall maintain a record of the date and duration (in hours) of the storm event(s) samples; rainfall measurements or estimates (in inches) of the storm event that generated the sampled runoff; the duration between the storm event samples and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and an estimate of the total volume (in gallons) of the discharge samples.

6.4.1. Sample Type

For discharges containing coal pile runoff, data shall be reported for a grab sample. All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the

permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

6.4.2. Sampling Waiver

When a discharger is unable to collect samples of coal pile runoff due to adverse climatic conditions, the discharger shall collect a substitute sample from a separate subsequent qualifying storm event. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

6.4.3. Representative Discharge

When a facility has two or more outfalls containing coal pile runoff that, based on a consideration of the other industrial activity, and significant materials, and upon management practices and activities within the area drained by the outfall, and the permittee reasonably believes substantially identical effluents are discharged, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfalls provided that the permittee includes in the stormwater pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (e.g., low (under 40 percent), medium (40 to 65 percent) or high (above 65 percent)) shall be provided in the SWPPP. Permittees required to submit monitoring information under part 8 of this permit shall include the description of the location of the outfalls, explanation of why outfalls are expected to discharge substantially identical effluents, and estimate of the size of the drainage area and runoff coefficient with the Annual Stormwater Monitoring Report (see Addendum D). This representative discharge provision is not applicable to stormwater discharges from coal piles regulated under the national effluent limitations guidelines.

6.4.4. Alternative Certification

Facilities with stormwater discharges containing coal pile runoff may not submit alternative certification in lieu of the required monitoring data.

6.4.5. When to Submit

Permittees with discharges containing coal pile runoff shall submit monitoring results annually no later than the 31st day of January.

7. STANDARD PERMIT CONDITIONS

7.1. Duty to Comply

7.1.1. Permittee's Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and/or the Tennessee Water Quality Control Act (TWQCA) is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

7.1.2. Penalties for Violations of Permit Conditions

Pursuant to T.C.A. 69-3-115 of The Tennessee Water Quality Control Act of 1977, as amended:

Any person who violates an effluent standard or limitation or a water quality standard established under this part (T.C.A. 69-3-101, et.seq.); violates the terms or conditions of this permit; fails to complete a filing requirement; fails to allow or perform an entry, inspection, monitoring or reporting requirement; violates a final determination or order of the board, panel or commissioner; or violates any other provision of this part or any rule or regulation promulgated by the board, is subject to a civil penalty of up to ten thousand dollars ($10,000) per day for each day during which the act or omission continues or occurs;

Any person unlawfully polluting the waters of the state or violating or failing, neglecting, or refusing to comply with any of the provisions of this part (T.C.A. 69-3-101, et.seq.) commits a Class C misdemeanor. Each day upon which such violation occurs constitutes a separate offense;

Any person who willfully and knowingly falsifies any records, information, plans, specifications, or other data required by the board or the commissioner, or who willfully and knowingly pollutes the waters of the state, or willfully fails, neglects or refuses to comply with any of the provisions of this part (T.C.A. 69-3-101, et.seq.) commits a Class E felony and shall be punished by a fine of not more than twenty-five thousand dollars ($25,000) or incarceration, or both.

Nothing in this permit shall be construed to relieve the discharger from civil or criminal penalties for noncompliance. Notwithstanding this permit, the discharger shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of stormwater to any surface or subsurface waters. Additionally, notwithstanding this permit, it shall be the responsibility of the discharger to conduct its stormwater treatment and/or discharge activities in a manner such that public or private nuisances or health hazards will not be created. Furthermore, nothing in this permit shall be construed to preclude the State of Tennessee from any legal action or relieve the discharger from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or the Federal Water Resources Act.

7.2. Continuation of the Expired General Permit

An expired general permit continues in force and effect until a new general permit is issued. Permittees that choose, or are required, to obtain an individual permit must submit an application (Forms 1 and 2F and any other applicable forms) 180 days prior to expiration of this permit. Permittees that are eligible and choose to be covered by a new general permit must submit an NOI by the date specified in that permit.

7.3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

7.4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

7.5. Duty to Provide Information

The permittee shall furnish to the division, within a time specified by the division, any information that the division may request to determine compliance with this permit. The permittee shall also furnish to the division upon request, copies of records required to be kept by this permit.

7.6. Other Information

When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the NOI or in any other report to the division, he or she shall promptly (or within the specified time frame as identified by the division) submit such facts or information.

7.7. Signatory Requirements

All Notices of Intent (NOI), requests for termination of permit coverage, stormwater pollution prevention plans, reports, certifications or information either submitted to the division (and/or the operator of a permitted municipal separate storm sewer system), or that this permit requires be maintained by the permittee, shall be signed.

7.7.1. Signatory Requirements for a Notice of Intent

The Notice of Intent shall be signed as follows:

For a corporation. By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

(1) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or

(2) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

NOTE: The division does not require specific assignments or delegations of authority to responsible corporate officers. The division will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the Director to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

For a partnership or sole proprietorship. By a general partner or the proprietor, respectively; or

For a municipality, State, Federal, or other public agency. By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes: (i) The chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

7.7.2. Signatory Requirements for Reports

All reports required by the permit and other information requested by the division shall be signed as follows:

All reports required by permits, and other information requested by the Director shall be signed by a person described in section 7.7.1 (Signatory Requirements for a Notice of Intent) of this part, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in section 7.7.1 (Signatory Requirements for a Notice of Intent) of this part;
(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) and,
(3) The written authorization is submitted to the director.

7.7.3. Changes to authorization

If an authorization under paragraph 7.7.2 (2) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph 7.7.2 (2) of this section must be submitted to the director prior to or together with any reports, information, or applications to be signed by an authorized representative.

7.7.4. Certification

Any person signing a document under paragraph 7.7.2 (1) or (2) of this section shall make the following certification:

> *"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury."*

7.7.5. Penalties for Falsification of Reports

Section 309c(4) of the Clean Water Act (CWA) provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or by both.

7.8. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act (CWA) or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

7.9. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.

7.10. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

7.11. Requiring an Individual Permit or an Alternative General Permit

7.11.1. Division of Water Resources Designation

The division may require any person authorized by this permit to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition the division to take action under this section. The division may require any owner or operator authorized to discharge under this permit to apply for an individual NPDES permit only if the owner or operator has been notified in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the owner or operator to file the application, and a statement that on the effective date of issuance or denial of the individual NPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Individual permit applications shall be submitted to the address shown in the list of EFOs under subpart 3.3 on page 14 of this permit for the division's Environmental Field Office responsible for the county where the facility is located. The division may grant additional time to submit the application upon request of the applicant. If an owner or operator fails to submit in a timely manner an individual NPDES permit application as required by the division, then the applicability of this permit to the individual NPDES permittee is automatically terminated at the end of the day specified for application submittal.

7.11.2. Individual Permit Application

Any owner or operator authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual NPDES permit. The owner or operator shall submit an individual application (Form 1 and Form 2F) with reasons supporting the request to the division. Individual permit applications shall be submitted to the address of the appropriate division's Environmental Field Office (see list of EFOs under subpart 3.3 on page 14 of this permit). The request may be granted by the issuance of any individual permit or an alternative general permit if the reasons cited by the owner or operator are adequate to support the request.

7.11.3. Individual/Alternative General Permit Issuance

When an individual NPDES permit is issued to an owner or operator otherwise subject to this permit, or the owner or operator is authorized for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to an owner or operator otherwise subject to this permit, or the owner or operator is denied for coverage under an alternative NPDES general

permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the division.

7.12. State/Environmental Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable Tennessee law or regulation under authority preserved by Section 510 of the Act.

No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

7.13. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related equipment) that are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of SWPPPs. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

7.14. Monitoring and Records

7.14.1. Representative Samples/Measurements

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

7.14.2. Retention of Records

The permittee shall retain records of all monitoring information, copies of all reports required by this permit, and records of all data used to complete the application of this permit for a period of at least three (3) years from the date of sample, measurement, evaluation or inspection, report, or application. This period may be extended by request of the division at any time. Permittees must submit any such records to the division upon request.

The permittee shall retain the SWPPP developed in accordance with parts 4 and 11 of this permit until a date 3 years after the last modification or amendment is made to the SWPPP, and at least 1 year after coverage under this permit terminates.

7.14.3. Records Contents

Records of monitoring information shall include:

- The date, exact place, and time of sampling or measurements;
- The initials or name(s) of the individual(s) who performed the sampling or measurements;
- The date(s) analyses were performed;

- The time(s) analyses were initiated;
- The initials or name(s) of the individual(s) who performed the analyses;
- References and written procedures, when available, for the analytical techniques or methods used; and
- The results of such analyses, including the bench sheets, instrument readouts, computer disks or tapes, etc., used to determine these results.

7.14.4. Approved Monitoring Methods

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

7.15. Inspection and Entry

The permittee shall allow the division or an authorized representative of the division, or, in the case of a facility that discharges through a municipal separate storm sewer, an authorized representative of the municipal operator or the separate storm sewer receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to: enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit; have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

7.16. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7.17. Bypass of Treatment Facility

7.17.1. Notice

Anticipated Bypass. If a permittee subject to the numeric effluent limitations of parts 5 and 11 of this permit knows in advance of the need for a bypass, he or she shall submit prior notice, if possible, at least 10 days before the date of the bypass; including an evaluation of the anticipated quality and effect of the bypass.

Unanticipated Bypass. The permittee subject to the numeric effluent limitations of parts 5 and 11 of this permit shall submit notice of an unanticipated bypass. Any information regarding the unanticipated bypass shall be provided orally within 24 hours from the time the permittee became aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee became aware of the circumstances. The written submission shall contain a description of the bypass and its cause; the period of the bypass; including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

7.17.2. Prohibition of Bypass

Bypass is prohibited and the division may take enforcement action against a permittee for a bypass. Unless:

(1) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
(2) There were no feasible alternatives to the bypass, such as the use of auxiliary facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if the permittee should, in the exercise of reasonable engineering judgment, have installed adequate backup equipment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and
(3) The permittee notified the division in accordance with section 7.17.1.

The division may approve an anticipated bypass after considering its adverse effects, if the division determines that it will meet the three conditions listed in paragraph 7.17.2.a) (above).

7.18. Upset Conditions

7.18.1. Affirmative Defense

An upset constitutes an affirmative defense to an action brought for noncompliance with technology-based numeric effluent limitations in parts 5 and 11 of this permit if the requirements of section 7.18.2 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

7.18.2. Required Defense

A permittee who wishes to establish the affirmative defense of an upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence, that:

An upset occurred and that the permittee can identify the specific cause(s) of the upset:

The permitted facility was at the time being properly operated; and

The permittee provided oral notice of the upset to the division within 24 hours from the time the permittee became aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee became aware of the circumstances. The written submission shall contain a description of the upset and its cause; the period of the upset; including exact dates and times, and if the upset has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the upset.

7.18.3. Burden of Proof

In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

8. REOPENER CLAUSE

8.1. Potential or Realized Impacts on Water Quality

If there is evidence indicating potential or realized impacts on water quality or on a listed endangered species due to any stormwater discharge associated with industrial activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or an alternative general permit in accordance with subpart 7.11 (Requiring an Individual Permit or an Alternative General Permit) of this permit or the permit may be modified to include different limitations and/or requirements.

8.2. Applicable Regulations

Permit modification or revocation will be conducted according to 40 CFR 122.62, 122.63, 122.64, and 124.5.

9. TERMINATION OF COVERAGE

9.1. Notice of Termination

Where all stormwater discharges associated with industrial activity that are authorized by this permit are eliminated, or where the operator of stormwater discharges associated with industrial activity at a facility changes, the operator of the facility shall submit a written request for such termination that is signed in accordance with part 7.7 (Signatory Requirements) of this permit. The written notice shall include the following information:

- Facility Information
  Name, mailing address, and location of the facility for which the notification is submitted;

- Operator Information
  The name, address, and telephone number of the operator addressed by the notice;

- Permit Tracking Number
  The NPDES permit tracking number (i.e. TNR05XXXX) for the stormwater discharge associated with industrial activity identified by the notice;

- Reason for Termination
  An indication of whether the stormwater discharges associated with industrial activity have been eliminated or the operator of the discharges has changed; and

- Certification
  The following certification signed in accordance with subpart 7.7 (Signatory Requirements) of this permit:

  > *"I certify under penalty of law that all stormwater discharges associated with industrial activity from the identified facility that are authorized by an NPDES general permit have been eliminated or that I am no longer the operator of the industrial activity. I understand that by submitting this notice of termination, that I am no longer authorized to discharge stormwater*

associated with industrial activity under this general permit, and that discharging pollutants in stormwater associated with industrial activity to waters of the state is unlawful under the Clean Water Act where the discharge is not authorized by an NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act."

9.2. Addresses

All written notices of termination are to be sent to the division's Environmental Field Office responsible for the county where the facility is located (see list of EFOs under subpart 3.3 on page 14 of this permit).

9.3. Electronic Submission of Notice of Termination

The division supports and encourages submission of electronic documents (e.g., scanned notices of termination submitted as PDF files) by using a dedicated email address:

Water.Permits@tn.gov

If the division notifies dischargers (directly by mail or E-mail, by public notice, or by making information available on the Internet) of other Notice of Termination options that become available at a later date (e.g., electronic submission of forms or letters), the permittees may take advantage of those options to satisfy the Notice of Termination notification requirements.

9.4. No Exposure Certification

The facility may discontinue permit coverage under the TMSP if it is eligible for the "no exposure" permit exemption. The "no exposure" permit exemption is a conditional exclusion applicable to all categories of industrial activity (except construction activity) with no exposure of industrial materials and activities to stormwater. All facilities with point source discharges of stormwater associated with industrial activity that satisfy criteria of no exposure and complete a no exposure certification form will be able to obtain exclusion from NPDES stormwater permitting under TMSP.

A condition of no exposure exists at an industrial facility when all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product. A storm resistant shelter is not required for the following industrial materials and activities:

- Drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak. "Sealed " means banded or otherwise secured and without operational taps or valves;
- Adequately maintained vehicles used in material handling; and

- Final products, other than products that would be mobilized in stormwater discharges (e.g., rock salt).

A no exposure certification must be provided for each facility qualifying for the no exposure exclusion. In addition, the exclusion from NPDES permitting is available on a facility-wide basis only, not for individual outfalls. If any industrial activities or materials are or will be exposed to precipitation, the facility is not eligible for the no exposure exclusion.

No exposure certification renewals must be submitted five years from the time they are first submitted (assuming the facility still qualifies for the exemption). If conditions change at a facility such that renewed TMSP coverage is needed, the facility must submit an NOI requesting coverage.

Facilities that qualify for and submit a "no exposure" certification are no longer authorized by nor required to comply with this permit. Furthermore, facilities that are no longer required to have permit coverage due to a "no exposure" exclusion, are not required to submit a Notice of Termination.

A copy of no exposure certification form can be obtained by requesting a copy of the form at the address listed below, from the division's Environmental Field Office responsible for the county where the facility is located (see list of EFOs under subpart 3.3 on page 14 of this permit), or at the department's web page for the TMSP (http://state.tn.us/environment/permits/strmh2o.shtml). The division supports and encourages submission of electronic documents (e.g., scanned NOIs submitted as PDF files) by using a dedicated email address:

Water.Permits@tn.gov

Alternatively, the no exposure certification form shall be submitted to the division at the following address:

Stormwater NOI Processing
Division of Water Resources
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243

10. DEFINITIONS AND LIST OF ACRONYMS

10.1. Definitions

Benchmarks: A guideline for facilities to measure their storm water monitoring results, so that if their sample results are above the established (benchmark values) they will know to implement BMPs and modify their SWPPP to bring the results back below the established value.

Best Management Practices ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the state. BMPs also include treatment requirements, operating

procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

Coal pile runoff means the rainfall runoff from or through any coal storage pile.

Co-located industrial activity means when a facility has industrial activities being conducted onsite that are described under more than one of the coverage sections of part 11 in this permit (Discharges Covered Under This Section). Facilities with co-located industrial activities shall comply with all applicable monitoring and pollution prevention plan requirements of each section in which a co-located industrial activity is described. Provisions under applicable co-located facilities sections should be applied on an outfall-specific basis.

CWA means Clean Water Act (formerly referred to as the Federal Water Resources Act or Federal Water Resources Act Amendments of 1972).

Commercial Treatment and Disposal Facilities means facilities that receive, on a commercial basis, any produced hazardous waste (not their own) and treat or dispose of those wastes as a service to the generators. Such facilities treating and/or disposing exclusively residential hazardous wastes are not included in this definition.

Director means the Director of the Division of Water Resources, or an authorized representative.

Exceptional Tennessee Waters are surface waters of the state of Tennessee that are identified by the department as Exceptional Tennessee waters in the Tennessee Rule 0400-40-3. Characteristics of Exceptional Tennessee waters are listed at Rule 0400-40-3-.06 of the official compilation - rules and regulations of the State of Tennessee. Characteristics include waters designated by the Water Quality Control Board as **Outstanding National Resource Waters** (ONRW); waters that provide habitat for ecologically significant populations of certain aquatic or semi-aquatic plants or animals; waters that provide specialized recreational opportunities; waters that possess outstanding scenic or geologic values; or waters where existing conditions are better than water quality standards. Exceptional Tennessee waters are sometimes referred to as Exceptional TN Waters or ONRW waters. A list of known Exceptional Tennessee Waters is available on the web at:
http://environment-online.state.tn.us:7654/pls/enf_reports/f?p=9034:34304

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots collected at a constant time interval, where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab Sample is a single stormwater runoff sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes, collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The sample shall be collected at the period most representative of the total discharge, recognizing that a “first flush” sample would be the most accurate representation for various pollutants in the stormwater runoff.

Inactive Landfill is considered inactive when, on a permanent basis, it will no longer receive waste and has completed closure in accordance with any applicable Federal, State, and/or local requirements.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal and that is not a land application unit, surface impoundment, injection well, or waste pile.

Landfill wastewater as defined in 40 CFR Part 445 (Landfills Point Source Category) is all wastewater associated with, or produced by, landfilling activities except for sanitary wastewater, non-contaminated stormwater, contaminated groundwater, and wastewater from recovery pumping wells. Landfill wastewater includes, but is not limited to, leachate, gas collection condensate, drained free liquids, laboratory derived wastewater, contaminated stormwater and contact wash water from washing truck, equipment, and railcar exteriors and surface areas which have come in direct contact with solid waste at the landfill facility. Non-contaminated stormwater runoff from landfill is stormwater which does not come into direct contact with landfill wastes, the waste handling and treatment areas, or landfill wastewater as defined in 40 CFR 445.2. Non-contaminated stormwater includes stormwater which flows off the cap, cover, intermediate cover, daily cover, and/or final cover of the landfill.

Leachate is a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.

Large and medium municipal separate storm sewer system (MS4) means all municipal separate storm sewers that are either:

1. Located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR Part 122); or
2, Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 CFR Part 122); or
3. Owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the division as part of the large or medium municipal separate storm sewer system.

Lists of Phase I (large and Median size MS4s), and Phase II (small MS4s), can be found on the division's MS4 webpage: Tennessee MS4 and by using the division's Dataviewer application (http://tn.gov/environment/dataviewers.shtml)

Load Allocation (LA): The portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background (40 CFR 130.2(g)).

Margin of Safety (MOS): The "MOS" accounts for uncertainty in the loading calculation. The MOS may not be the same for different water bodies due to differences in the availability and strength of data used in the calculations.

No exposure certification is a conditional exclusion applicable to all categories of industrial activity (except construction activity) with no exposure of industrial materials and activities to stormwater. All facilities with point source discharges of stormwater associated with industrial activity that satisfy criteria of no exposure and complete a no exposure certification form will be able to obtain exclusion from NPDES stormwater permitting under TMSP.

Nonpoint Source: A nonpoint source is essentially any source of pollutant(s) that is not a point source. Examples are sheet flow from pastures and runoff from paved areas.

Point source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Qualified personnel are those who possess the knowledge and skills to assess conditions and activities that could impact stormwater quality at your facility, and who can also evaluate the effectiveness of control measures.

Section 313 water priority chemical means a chemical or chemical categories that: 1) are listed at 40 CFR 372.65 pursuant to Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986); 2) are present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and 3) meet at least one of the following criteria: (i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances); (ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR 116.4; or (iii) are pollutants for which EPA has published acute or chronic water quality criteria. See Addendum A of this permit. This addendum is based on the final rulemaking EPA published in the Federal Register November 30, 1994.

Significant materials includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to EPCRA Section 313; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges.

Significant spills includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (see 40 CFR 110.10 and CFR 117.21) or Section 102 of CERCLA (see 40 CFR 302.4).

Storm water means stormwater runoff, snow melt runoff, and surface runoff and drainage.

Stormwater runoff associated with industrial activity means the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in paragraphs (i) through (x) of this definition, the term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate

access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR Part 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. For the categories of industries identified in paragraph (xi) of this definition, the term includes only stormwater discharges from all areas (except access roads and rail lines) listed in the previous sentence where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to stormwater. For the purposes of this paragraph, material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities (including industrial facilities that are Federally, State, or municipally owned or operated that meet the description of the facilities listed in paragraphs (i) to (xi) of this definition) include those facilities designated under 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

1. Facilities subject to stormwater effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards that are exempted under category (xi) of this definition);
2. Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285), 29, 311, 32 (except 323), 33, 3441, 373;
3. Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(l) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of noncoal mining operations that have been released from applicable State or Federal reclamation requirements after December 12, 1990) and oil and gas exploration, production, processing or treatment operations or transmission facilities that discharge stormwater contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operation; inactive mining operations are mining sites that are not being actively mined, but that have an identifiable owner/operator;
4. Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;
5. Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;
6. Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;

7. Steam electric power generating facilities, including coal handling sites;
8. Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45 and 5171 that have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or that are otherwise identified under paragraphs (i) to (vii) or (ix) to (xi) of this subsection are associated with industrial activity;
9. Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 MGD or more, or required to have an approved pretreatment program under 40 CFR Part 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and that are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR Part 503;
10. Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than 5 acres of total land area that are not part of a larger common plan of development or sale;
11. Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and that are not otherwise included within categories (i) to (x)).

TMDL (Total Maximum Daily Load) The sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background (40 CFR 130.2(I)). TMDL is a study that: 1.quantifies the amount of a pollutant in a stream, 2.identifies the sources of the pollutant, 3.and recommends regulatory or other actions that may need to be taken in order for the stream to no longer be polluted. Following are actions that might be recommended: Re-allocate limits on the sources of pollutants documented as impacting streams. It might be necessary to lower the amount of pollutants being discharged under NPDES permits or to require the installation of other control measures, if necessary, to insure that standards will be met. For sources the division does not have regulatory authority over, such as ordinary non-point source agricultural and forestry activities, provide information and technical assistance to other state and federal agencies that work directly with these groups to install appropriate Best Management Practices. Even for the impacted streams, TMDL development is not considered appropriate for all bodies of water: if enforcement has already been taken and a compliance schedule has been developed; or if best management practices have already been installed for non-regulated activities, the TMDL is considered not applicable. In cases involving pollution sources in other states, the recommendation may be that another state or EPA perform the TMDL. TMDL's can also be described by the following equation:

TMDL = sum of non-point sources (LA)+ sum of point sources (WLA)+ margin of safety

Uncontrolled sanitary landfill means a landfill or open dump, whether in operation or closed, that does not meet the requirements for run-on or runoff controls established pursuant to subtitle D of the Solid Waste Disposal Act.

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with the numeric effluent limitations of parts 5 and 11 of this permit because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Wasteload allocation (WLA): The portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute the type of water quality-based effluent limitation. (40 CFR 130.2(h)).

Waste pile means any noncontainerized accumulation of solid, nonflowing waste that is used for treatment or storage.

Water quality-limited segments: Those water segments that do not or are not expected to meet applicable water quality standards even after the application of technology.

Waters of the State or simply **Waters** is defined in the Tennessee Water Quality Control Act and means any and all water, public or private, on or beneath the surface of the ground, which are contained within, flow through or border upon Tennessee or any portion thereof except those bodies of water confined to and retained within the limits of private property in single ownership which do not combine to effect a junction with natural surface or underground waters.

Wet weather conveyance is defined in the Tennessee Water Quality Control Act and means, notwithstanding any other law or rule to the contrary, man-made or natural watercourses, including natural watercourses that have been modified by channelization:

(A) That flow only in direct response to precipitation runoff in their immediate locality;

(B) Whose channels are at all times above the groundwater table;

(C) That are not suitable for drinking water supplies; and

(D) In which hydrological and biological analyses indicate that, under normal weather conditions, due to naturally occurring ephemeral or low flow there is not sufficient water to support fish, or multiple populations of obligate lotic aquatic organisms whose life cycle includes an aquatic phase of at least two (2) months.

10.2. List of Acronyms

ARAP	Aquatic Resource Alteration Permit
BMP	Best Management Practice
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CGP	Construction General Permit
CWA	Clean Water Act
EFO	Environmental Field Office
EPA	(U.S.) Environmental Protection Agency
EPSC	Erosion Prevention and Sediment Control
MS4	Municipal Separate Storm Sewer System
NOC	Notice of Coverage

NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
ONRW	Outstanding National Resource Waters
POTW	Publicly Owned Treatment Works
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollution Prevention Plan
TDEC	Tennessee Department of Environment and Conservation
TDOT	Tennessee Department of Transportation
TMDL	Total Maximum Daily Load
TMSP	Tennessee Multi-Sector General Permit for the Discharge of Stormwater from an Industrial Activity
TVA	Tennessee Valley Authority
TWQCA	Tennessee Water Quality Control Act
UIC	Underground Injection Control
USGS	United States Geological Survey
WLA	Waste Load Allocation

Sector C - Stormwater Discharges Associated With Industrial Activity From Chemical and Allied Products Manufacturing Facilities

1. Discharges Covered Under This Section

The requirements listed under this section shall apply to stormwater discharges associated with industrial activity from a facility engaged in manufacturing the following products and generally described by the SIC codes shown below:

SIC Code	Sector C: Chemical and Allied Products Manufacturing Facilities	Sampling Required?	Table Number
2812	Alkalies and Chlorine	Yes	C-3
2813	Industrial Gases	Yes	C-3
2816	Inorganic Pigments	Yes	C-3
2819	Industrial Inorganic Chemicals, NEC	Yes	C-3
2821	Plastics Material Synthetic Resins, and Nonvulcanizable Elastomers	Yes	C-5
2822	Synthetic Rubber	Yes	C-5
2823	Cellulosic Manmade Fibers	Yes	C-5
2824	Manmade Organic Fibers, Except Cellulosic	Yes	C-5
2841	Soaps and Other Detergents, Except Specialty Cleaners	Yes	C-4
2833	Medicinal Chemicals and Botanical Products	No	--
2834	Pharmaceutical Preparation	No	--
2835	*In Vitro* and *in Vitro* Diagnostic Substances	No	--
2836	Biological Products, except Diagnostic Substances	No	--
2842	Specialty Cleaning, Polishing, and Sanitary Preparations	Yes	C-4
2843	Surface Active Agents, Finishing Agents, Sulfonated Oils, and Assistants	Yes	C-4
2844	Perfumes, Cosmetics, and Other Toilet Preparations	Yes	C-4
2851	Paints, Varnishes, Lacquers, Enamels, and Allied Products	No	--
2861	Gum and Wood Chemicals	No	--
2865	Cyclic Organic Crudes and Intermediates, and Organic Dyes and Pigments	No	--
2869	Industrial Organic Chemicals, NEC	No	--
2873	Nitrogenous Fertilizers	Yes	C-2
2874	Phosphatic Fertilizers	Yes	C-1
2875	Fertilizers, Mixing Only	Yes	C-2
2879	Pesticides and Agricultural Chemicals, NEC	Yes	C-2
2891	Adhesives and Sealants	No	--
2892	Explosives	No	--
2893	Printing Ink	No	--
2895	Carbon Black	No	--
2899	Chemicals and Chemical Preparations, NEC	No	--

Co-located Industrial Activities. When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

Limitations on Coverage. The following stormwater discharges associated with industrial activity are not authorized by this section of the permit:

- Storm water discharges from drug manufacturing facilities and other establishments classified as SIC Code 283X.

2. Special Conditions

Prohibition of Non-stormwater Discharges. Except for those allowable non-stormwater discharges included in section 3.1.2 (Allowable Non-Stormwater Discharges) of this permit, there are no other non-stormwater discharges authorized in this Sector.

3. Stormwater Pollution Prevention Plan Requirements

3.1 Deadlines for Plan Preparation and Compliance. There are no additional deadlines for plan preparation and compliance, other than those stated in subpart 4.1.

3.2 Contents of Plan. The plan shall include, at a minimum, the following items:

3.2.1 Pollution Prevention Team. Each plan shall identify a specific individual or individuals within the facility organization as members of a stormwater Pollution Prevention Team that are responsible for developing the stormwater pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's stormwater pollution prevention plan.

3.2.2 Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources that may reasonably be expected to add significant amounts of pollutants to stormwater discharges or that may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials that may potentially be significant pollutant sources. Each plan shall include, at a minimum:

3.2.2.1 Drainage. A site map indicating an outline of the portions of the drainage area of each stormwater outfall that are within the facility boundaries, each existing structural control measure to reduce pollutants in stormwater runoff, surface water bodies, locations where significant materials are exposed to precipitation, locations where major spills or leaks identified under 3.2.2.3 (spills and leaks) of this permit have occurred, and the locations of the following activities where such activities are exposed to precipitation: fueling stations, vehicle and equipment maintenance and/or cleaning areas, loading/unloading areas, locations used for the treatment, storage or disposal of wastes, liquid storage tanks, processing areas and storage areas including areas where raw materials, finished products and drums are stored. The map must indicate the outfall locations and the types of discharges contained in the drainage areas of the outfalls.

For each area of the facility that generates stormwater discharges associated with industrial activity with a reasonable potential for containing significant amounts of pollutants, the plan should include a prediction of the direction of flow, and an identification of the types of pollutants that are likely to be present in stormwater discharges associated with industrial

activity. Factors to consider include the toxicity of a chemical; quantity of chemicals used, produced or discharged; the likelihood of contact with stormwater; and history of significant leaks or spills of toxic or hazardous pollutants. Flows with a significant potential for causing erosion shall be identified.

3.2.2.2 Inventory of Exposed Materials - An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to stormwater between the time of 3 years prior to the date of the submission of an NOI to be covered under this permit and the present; method and location of onsite storage or disposal; materials management practices employed to minimize contact of materials with stormwater runoff between the time of 3 years prior to the date of the submission of an NOI to be covered under this permit and the present; the location and a description of existing structural and nonstructural control measures to reduce pollutants in stormwater runoff; and a description of any treatment the stormwater receives.

3.2.2.3 Spills and Leaks - A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at areas that are exposed to precipitation or that otherwise drain to a stormwater conveyance at the facility after the date of 3 years prior to the date of the submission of an NOI to be covered under this permit. Such list shall be updated as appropriate during the term of the permit.

3.2.2.4 Sampling Data - A summary of existing discharge sampling data describing pollutants in stormwater discharges from the facility, including a summary of sampling data collected during the term of this permit.

3.2.2.5 Risk Identification and Summary of Potential Pollutant Sources - A narrative description of the potential pollutant sources from the following activities: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; significant dust or particulate generating processes; and onsite waste disposal practices. The description shall specifically list any significant potential source of pollutants at the site and for each potential source, any pollutant or pollutant parameter (e.g., biochemical oxygen demand, etc.) of concern shall be identified.

3.2.3 Measures and Controls. Each facility covered by this permit shall develop a description of stormwater management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of stormwater management controls shall address the following minimum components, including a schedule for implementing such controls:

3.2.3.1 Good Housekeeping - Good housekeeping requires the maintenance of areas that may contribute pollutants to stormwater discharges in a clean, orderly manner. Particular attention should be paid to areas where raw materials are stockpiled, material handling areas, storage areas, liquid storage tanks, material handling areas, and loading/unloading areas. The areas surrounding storm drain inlets and outfall points should also be free of material that could discharge off-site and contribute to pollutants in stormwater.

3.2.3.2 Preventive Maintenance - A preventive maintenance program shall involve timely inspection and maintenance of stormwater management devices (e.g., cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

3.2.3.3 Spill Prevention and Response Procedures - Areas where potential spills that can contribute pollutants to stormwater discharges can occur, and their accompanying drainage points shall be identified clearly in the stormwater pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean-up should be available to personnel.

3.2.3.4 Inspections - In addition to or as part of the comprehensive site evaluation required under this section, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility at appropriate intervals specified in the SWPPP. Material storage and handling areas, liquid storage tanks, hoppers or silos, vehicle and equipment maintenance, cleaning, and fueling areas, material handling vehicles, equipment and processing areas shall be inspected at least once per month as part of the maintenance program. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained as part of the SWPPP. The use of a checklist developed by the facility is encouraged.

Note that additional Stormwater Pollution Prevention Plan (SWPPP) requirements for discharges into waters with unavailable parameters or Exceptional Tennessee waters, as described in the subpart 4.6 of this permit may be applicable to your facility.

3.2.3.5 Employee Training - Employee training programs shall inform personnel responsible for implementing activities identified in the stormwater pollution prevention plan or otherwise responsible for stormwater management at all levels of responsibility of the components and goals of the stormwater pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The pollution prevention plan shall identify periodic dates for such training.

3.2.3.6 Recordkeeping and Internal Reporting Procedures - A description of incidents (such as spills, or other discharges), along with other information describing the quality and quantity of stormwater discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

3.2.3.7 Non-stormwater Discharges

3.2.3.7.1 The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-stormwater discharges. The certification shall include the identification of potential significant sources of non-stormwater at the site, a description of the results of any test and/or evaluation for the presence of non-stormwater discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the onsite drainage

points that were directly observed during the test. Certifications shall be signed in accordance with subpart 7.7 of this permit. Such certification may not be feasible if the facility operating the stormwater discharge associated with industrial activity does not have access to an outfall, manhole, or other point of access to the ultimate conduit that receives the discharge. In such cases, the source identification section of the stormwater pollution prevention plan shall indicate why the certification required by this part was not feasible, along with the identification of potential significant sources of non-stormwater at the site. A discharger that is unable to provide the certification required by this paragraph must notify the Division of Water Resources in accordance with paragraph 3.2.3.7.3 "Failure to Certify" (below).

3.2.3.7.2 Sources of non-stormwater that are combined with stormwater discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Any non-stormwater discharges that are not authorized under this permit or another NPDES permit should be brought to the attention of the division's local Environmental Field Office (see list of EFOs on page 14).

3.2.3.7.3 Failure to Certify - Any facility that is unable to provide the certification required (testing for non-stormwater discharges), must notify the Division of Water Resources not later than 180 days after submitting an NOI to be covered by this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe: the procedure of any test conducted for the presence of non-stormwater discharges; the results of such test or other relevant observations; potential sources of non-stormwater discharges to the storm sewer; and why adequate tests for such storm sewers were not feasible. Non-stormwater discharges to waters of the state that are not authorized by an NPDES permit are unlawful, and must be terminated.

3.2.3.8 Sediment and Erosion Control - The plan shall identify areas that, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization measures to be used to limit erosion.

3.2.3.9 Management of Runoff - The plan shall contain a narrative consideration of the appropriateness of traditional stormwater management practices (practices other than those that control the generation or source(s) of pollutants) used to divert, infiltrate, reuse, or otherwise manage stormwater runoff in a manner that reduces pollutants in stormwater discharges from the site. The plan shall provide that measures that the permittee determines to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to stormwater discharges associated with industrial activity [see paragraph 3.2.2 of this section (Description of Potential Pollutant Sources)] shall be considered when determining reasonable and appropriate measures. Appropriate measures may include: vegetated swales, reuse of collected stormwater (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), infiltration devices, and detention/retention basins or other equivalent measures.

3.2.4 Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the SWPPP, but in no case less than once a year. Evaluations shall be conducted at least once at portable plant locations that are not in operation for a complete year. Such evaluations shall provide:

3.2.4.1 Areas contributing to a stormwater discharge associated with industrial activity including; material storage and handling areas, liquid storage tanks, hoppers or silos, vehicle and equipment maintenance, cleaning, and fueling areas, material handling vehicles, equipment and processing areas, and areas where aggregate is stockpiled outdoors shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system (and potentially waters of the state). Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural stormwater management measures, (e.g., oil/water separators, detention ponds, sedimentation basins or equivalent measures) sediment and erosion control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as dust collection equipment and spill response equipment, shall be made.

3.2.4.2 Based on the results of the evaluation, the description of potential pollutant sources identified in the plan in accordance with 3.2.2 of this section (description of potential pollutant sources) and pollution prevention measures and controls identified in the plan in accordance with section 3.2.3 of this sector (measures and controls) shall be revised as appropriate within 2 weeks of such evaluation and shall provide for implementation of any changes to the plan in a timely manner, but in no case later than 12 weeks after the evaluation.

3.2.4.3 A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the stormwater pollution prevention plan, and actions taken in accordance with paragraph (4)(b) (above) of the permit shall be made and retained as part of the stormwater pollution prevention plan for at least 3 years after the date of the evaluation. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the stormwater pollution prevention plan and this permit. The report shall be signed in accordance with subpart 7.7 (Signatory Requirements) of this permit.

3.2.4.4 Where compliance evaluation schedules overlap with inspections, the compliance evaluation may be conducted in place of one such inspection.

4. Numeric Effluent Limitations

In addition to the numeric effluent limitations described in subpart 5.2 (Coal Pile Runoff) of the TMSP, the following effluent limitations shall be met by existing and new discharges with:

Phosphate Fertilizer Manufacturing Runoff. The provisions of this paragraph are applicable to stormwater discharges from the Phosphate Subcategory of the Fertilizer Manufacturing Point Source Category (40 CFR 418.10). The term contaminated stormwater runoff shall mean precipitation runoff, that during manufacturing or processing, comes into contact with any raw materials, intermediate product, finished product, by-products or waste product (40 CFR 418.11(c)). The monitoring requirements for other parameters in stormwater discharges are in Table C-1.

Table C-1. Numeric Effluent Limits for Phosphate Subcategory of the Fertilizer Mfg. Point Source Category

Pollutants of Concern	Daily Maximum [mg/L]
Total Phosphorus (as P)	105
Fluoride	75

5. Monitoring and Reporting Requirements

Permittees subject to Numeric Effluent Limitations described in subpart 5.2 above (Coal Pile Runoff) must submit to the division monitoring results annually on a signed copy of the Discharge Monitoring Report (DMR, see Addendum E).

Permittees subject to Numeric Effluent Limitations as described in part 4 of this sector (above) must submit to the division monitoring results annually on a signed copy of the Discharge Monitoring Report (DMR, see Addendum E).

Permittees subject to Analytical Monitoring Requirements as described in subpart 5.1 of this sector (see below) must submit the benchmark results using an Annual Stormwater Monitoring Report (see Addendum D) to the division.

5.1 Analytical Monitoring Requirements

During the term of this permit, permittees covered under this sector must monitor their stormwater discharges associated with industrial activity at least once per calendar year (annually), except as provided in paragraphs 5.1.3 (Sampling Waiver), 5.1.4 (Representative Discharge), and 5.1.5 (Alternative Certification). For SIC-specific breakdown of monitoring requirements and applicable Monitoring Requirements (listed below), see Table in part 1 of this industrial sector (1. Discharges Covered Under This Section). Facilities must report in accordance with 6.b. (Reporting). In addition to the parameters listed in Tables C-2, C-3, C-4, and C-5 below, the permittee shall maintain a record of the date and duration (in hours) of the storm event(s) sampled; rainfall measurements or estimates (in inches) of the storm event that generated the sampled runoff; the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and an estimate of the total volume (in gallons) of the discharge sampled.

Table C-2. Benchmarks for Agricultural Chemicals Monitoring Requirements

Pollutants of Concern	Benchmark [mg/L]
Nitrate plus Nitrite Nitrogen	0.68
Total Recoverable Lead	0.156
Total Recoverable Iron	5
Total Recoverable Zinc	0.395
Phosphorus	2.0

Table C-3. Benchmarks for Industrial Inorganic Chemicals Monitoring Requirements

Pollutants of Concern	Benchmark [mg/L]
Ammonia	4
Total Recoverable Aluminum	0.75
Total Recoverable Copper	0.018
Total Recoverable Magnesium	0.064
Total Recoverable Iron	5.
Nitrate plus Nitrite Nitrogen	0.68

Table C-4. Benchmarks for Soaps, Detergents, Cosmetics, and Perfumes Monitoring Requirements

Pollutants of Concern	Benchmark [mg/L]
Nitrate plus Nitrite Nitrogen	0.68
Total Recoverable Zinc	0.395

Table C-5. Benchmark for Plastics, Synthetics, and Resins Monitoring Requirements

Pollutants of Concern	Benchmark [mg/L]
Total Recoverable Zinc	0.395

5.1.1 Monitoring Periods. Agricultural chemical manufacturing facilities; industrial inorganic chemical facilities; soaps, detergents, cosmetics, and perfume manufacturing facilities; and plastics, synthetics, and resin manufacturing facilities shall monitor samples collected during any period of a calendar year, as long as the samples are representative of the quantity and quality of the stormwater runoff being discharged from the facility.

5.1.2 Sample Type. A minimum of one grab sample shall be taken. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the

preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. If stormwater discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the stormwater discharge before it mixes with the non-stormwater discharge.

In addition, the permittee shall evaluate the results obtained from sampling and monitoring following the required annual sampling events to determine whether the facility is below, meets, or exceeds the monitoring benchmarks as shown in the table above. If the results of annual stormwater runoff monitoring demonstrate that the facility has exceeded the benchmark(s), the permittee must inform the division's local Environmental Field Office in writing within 30 days from the time stormwater monitoring results were received, describing the likely cause of the exceedance(s). Furthermore, within 60 days from the time stormwater monitoring results were received, the facility must review its stormwater pollution prevention plan, make any modifications or additions to the plan which would assist in reducing effluent concentrations to less than the monitoring benchmarks for that facility, and submit to the division's local Environmental Field Office a brief summary of the proposed SWPPP modifications (including a timetable for implementation). The modification or additions to the SWPPP should be implemented as soon as practicable.

In the event of a repeated benchmark exceedance, the permittee can, in consultation with the division, make a determination that no further pollutant reduction is technologically available, economically practicable and achievable in light of best industry practices. The permittee must document the rationale for concluding that no further pollutant reductions are achievable, and retain all records related to this documentation with the SWPPP.

5.1.3 Sampling Waiver

5.1.3.1 Adverse Conditions - When a discharger is unable to collect samples within a specified sampling period due to adverse climatic conditions, the discharger shall collect a substitute sample from a separate qualifying event in the next period and submit the data along with data for the routine sample in that period. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricanes, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

5.1.3.2 Low Concentration Waiver - When the average concentration for a pollutant calculated from monitoring data collected from first 4 calendar years of monitoring is less than the corresponding reporting value for that pollutant (Monitoring Benchmark); a facility may waive monitoring and reporting requirements in the last annual monitoring period. The

facility must submit to the Division of Water Resources, in lieu of the monitoring data, a certification that there has not been a significant change in industrial activity or the pollution prevention measures in area of the facility that drains to the outfall for which sampling was waived.

5.1.3.3 When a discharger is unable to conduct annual chemical stormwater sampling at an inactive and unstaffed site, the operator of the facility may exercise a waiver of the monitoring requirements as long as the facility remains inactive and unstaffed. The facility must submit to the Division of Water Resources, in lieu of monitoring data, a certification statement on the TMSP Stormwater Monitoring Report stating that the site is inactive and unstaffed so that collecting a sample during a qualifying event is not possible.

5.1.3.4 Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the stormwater pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan. The permittee shall include the description of the location of the outfalls, explanation of why outfalls are expected to discharge substantially identical effluents, and estimate of the size of the drainage area and runoff coefficient with the TMSP Stormwater Monitoring Report.

5.1.3.5 Alternative Certification. A discharger is not subject to the monitoring requirements of this section provided the discharger makes a certification for a given outfall or on a pollutant-by-pollutant basis in lieu of monitoring reports required under paragraph (b) below, under penalty of law, signed in accordance with subpart 7.7 (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, or significant materials from past industrial activity that are located in areas of the facility within the drainage area of the outfall are not presently exposed to stormwater and are not expected to be exposed to stormwater for the certification period. Such certification must be retained in the stormwater pollution prevention plan, and submitted to the Division of Water Resources in accordance with subpart 6.2 of this permit. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph b. below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations.

5.2 Reporting

Permittees with analytical monitoring requirements shall submit monitoring results for each outfall associated with industrial activity [or a certification in accordance with Sections (3),

(4), or (5) above] obtained during the annual reporting period on TMSP Stormwater Monitoring Report Form(s). **The form(s) shall be submitted 30 days after the sampling results are obtained, but no later than the March 31st of the following calendar year, whichever comes first.** For each outfall, one signed TMSP Stormwater Monitoring Report form must be submitted to the Division of Water Resources. Signed copies of TMSP Stormwater Monitoring Reports, or said certifications, shall be submitted to the division at the appropriate EFO for the county where the facility is located. A list of EFOs and their addresses are available in subpart 3.3 above:

5.3 Compliance Monitoring Requirements. In addition to the monitoring required in paragraph 6a (above), permittees with contaminated stormwater runoff from phosphate fertilizer manufacturing facilities must monitor their contaminated stormwater discharges for the presence of phosphorus and fluoride at least annually (one time per year). Facilities must report in accordance with Reporting. In addition to the parameters listed above, the permittee shall maintain a record of the date and duration (in hours) of the storm event(s) sampled; rainfall measurements or estimates (in inches) of the storm event that generated the sampled runoff; the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and an estimate of the total volume (in gallons) of the discharge sampled;

5.3.1 Sample Type A minimum of one grab sample shall be taken. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

5.3.2 Reporting. Permittees with phosphate fertilizer manufacturing facilities shall submit monitoring results obtained during the reporting period beginning the effective date of this permit on TMSP Stormwater Monitoring Report Form(s) postmarked no later than the last day of the month following the effective date. For each outfall, one signed TMSP Stormwater Monitoring Report form must be submitted to the Division of Water Resources. Signed copies of TMSP Stormwater Monitoring Reports, or said certifications, shall be submitted to the division at the appropriate EFO for the county where the facility is located. A list of EFOs and their addresses are available in subpart 3.3 above.

5.3.3 Quarterly Visual Examination of Stormwater Quality. Facilities shall perform and document a visual examination of a stormwater discharge associated with industrial activity from each outfall, except discharges exempted below. The examination must be made at least once in each of the following periods: January through March; April through June; July through September; and October through December during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event.

5.3.3.1 Examinations shall be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollution. The examination must be conducted in a well-lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

5.3.3.2 Visual examination reports must be maintained onsite in the pollution prevention plan or with other compliance records. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the stormwater discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollution), and probable sources of any observed stormwater contamination.

5.3.3.3 When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfalls and report that the examination data also applies to the substantially identical outfall(s) provided that the permittee includes in the stormwater pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

5.3.3.4 When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examination. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricanes, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

When a discharger is unable to conduct visual stormwater examinations at an inactive and unstaffed site, the operator of the facility may exercise a waiver of the monitoring requirement as long as the facility remains inactive and unstaffed. The facility must maintain a certification with the pollution prevention plan stating that the site is inactive and unstaffed so that performing visual examinations during a qualifying event is not feasible.

Appendix B
Figures

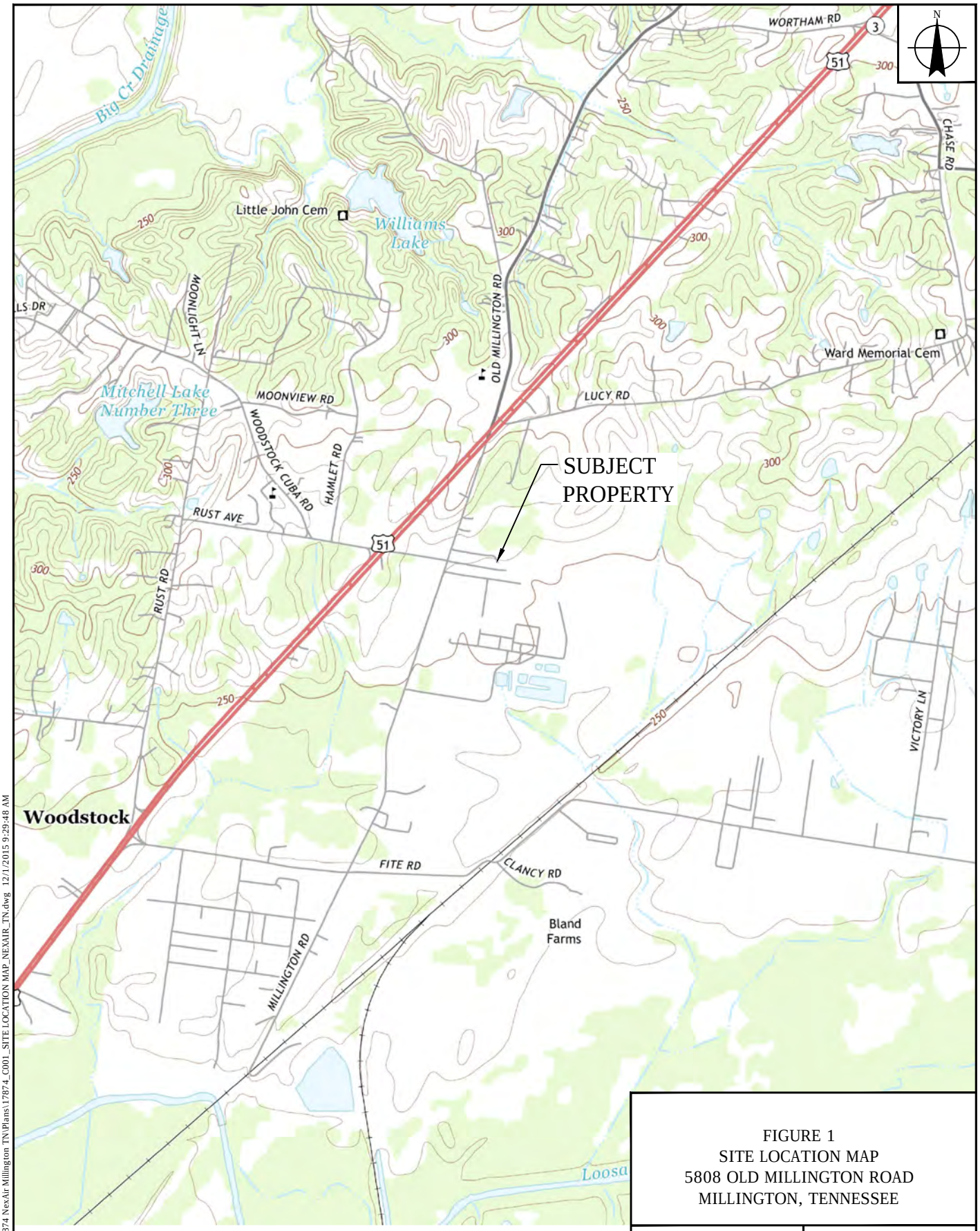


FIGURE 1
SITE LOCATION MAP
5808 OLD MILLINGTON ROAD
MILLINGTON, TENNESSEE

0 1,000 2,000
SCALE IN FEET
COORDINATE SYSTEM: NAD 1983
UTM ZONE 16

REQUESTED BY:	RB
DRAWN BY:	CC
DATE:	10/19/2016
PROJECT:	0888813093

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DATA SOURCES: U.S. Geological Survey. Millington Quadrangle, Tennessee [Map]. Photorevised 2013. 1:24,000. 7.5 Minute Series.

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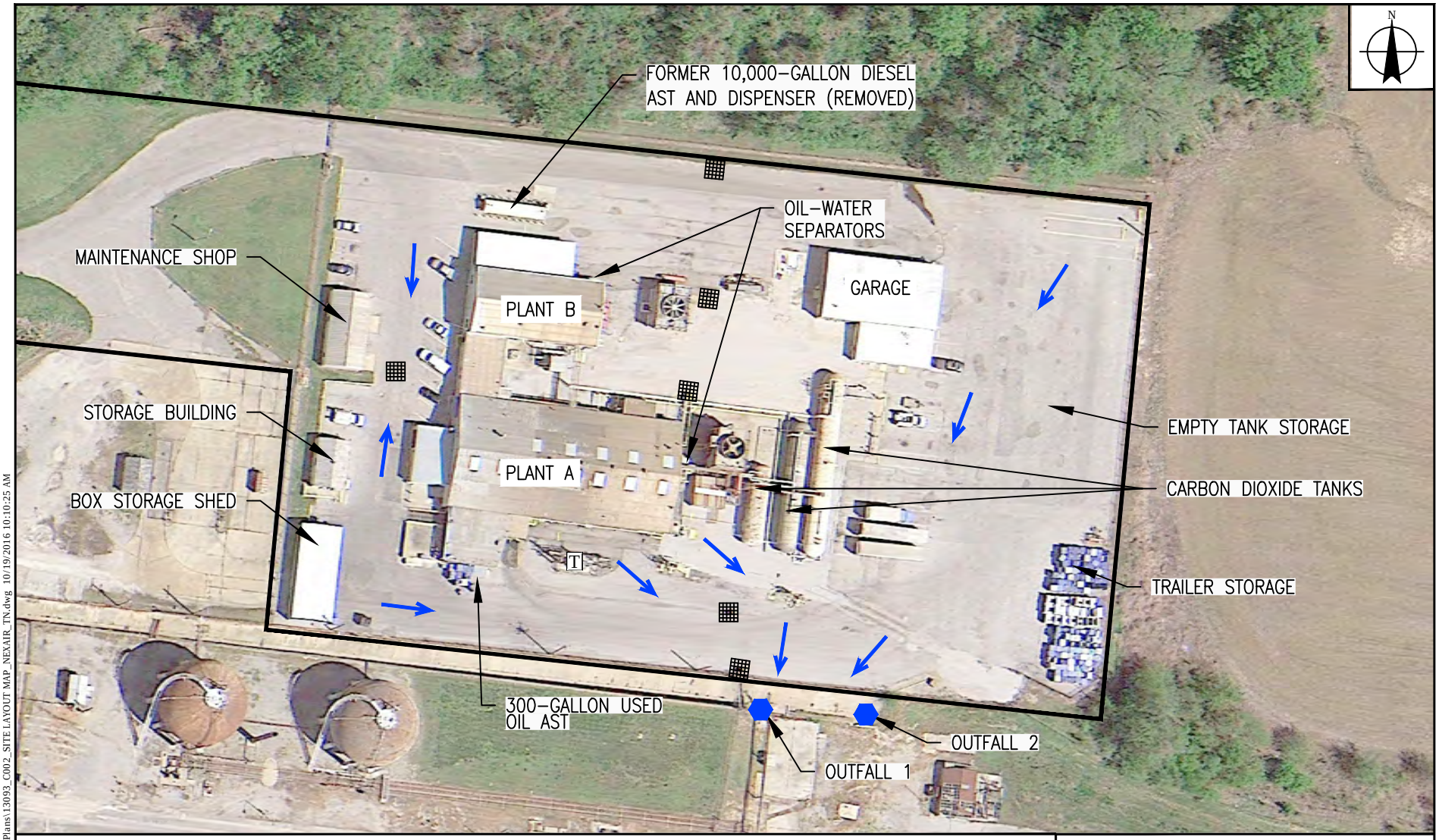

LEGEND

- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- FLOW DIRECTION
- OUTFALL
- T TRANSFORMER
- STORM DRAIN
- AST ABOVEGROUND STORAGE TANK
- UST UNDERGROUND STORAGE TANK

NOT TO SCALE

FIGURE 2
SITE LAYOUT MAP
5808 OLD MILLINGTON ROAD
MILLINGTON, TENNESSEE

REQUESTED BY:	RB
DRAWN BY:	CC
DATE:	10/19/2016
PROJECT:	0888813093

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DATA SOURCES: Google Earth Pro Imagery Date: 04/22/2014

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Appendix C
Best Management Practices Manual

STORM WATER POLLUTION PREVENTION PLAN
BMP MANUAL

Best Management Practices (BMPs) are measures used to prevent or reduce pollution from any type of activity. BMPs may include processes, procedures, schedules of activities, prohibitions on practices, and other additional management practices to prevent or reduce water pollution. They are anything which may be identified as a method; inexpensive or costly, short of actual treatment, to curb water pollution. BMPs can be almost anything that prevents toxic or hazardous substances from entering the environment.

The purpose of this appendix of the Storm Water Pollution Prevention Plan (SWPPP) is to describe some basic BMPs required to be included in the SWPPP and offer some guidelines about how to select BMPs that apply to the specific pollutant sources on a particular site.

Implementation of these or other BMPs should be documented and maintained as part of the overall SWPPP. The effectiveness of the BMPs selected should be evaluated annually or when conditions warrant additional evaluations.

This BMP Manual is comprised of fact sheets that are organized by activity. The following checklists may be used to select BMPs when new projects are planned or problems are encountered during storm water inspections.

BMP CHECKLIST

ADMINISTRATIVE SOURCE CONTROL BMPs			
☐	ASC-1 GOOD HOUSEKEEPING	☐	ASC-7 RECORD KEEPING
☐	ASC-2 PREVENTATIVE MAINTENANCE	☐	ASC-8 PREVENTATIVE MONITORING PRACTICES
☐	ASC-3 VISUAL INSPECTIONS	☐	ASC-9 SECURITY
☐	ASC-4 SPILL PREVENTION AND RESPONSE	☐	ASC-10 AREA CONTROL PROCEDURES
☐	ASC-5 MANAGEMENT OF RUNOFF	☐	ASC-11 SIGNS AND LABELS
☐	ASC-6 PERSONNEL TRAINING		
VEHICLE AND EQUIPMENT MANAGEMENT BMPs			
☐	VEM-1 FUELING STATIONS	☐	VEM-5 DRIP PANS
☐	VEM-2 VEHICLE AND EQUIPMENT MAINTENANCE	☐	VEM-6 VEHICLE POSITIONING
☐	VEM-3 PAINTING OPERATIONS	☐	VEM-7 LOADING AND UNLOADING BY AIR PRESSURE OR VACUUM
☐	VEM-4 VEHICLE AND EQUIPMENT WASHING	☐	VEM-8 VEHICLE WASHING
MATERIAL AND WASTE MANAGEMENT BMPs			
☐	MWM-1 LOADING AND UNLOADING	☐	MWM-7 COVERING
☐	MWM-2 LIQUID STORAGE IN ABOVEGROUND TANKS	☐	MWM-8 SWEEPING
☐	MWM-3 INDUSTRIAL WASTE MANAGEMENT AREAS AND OUTSIDE MANUFACTURING	☐	MWM-9 SHOVELING
☐	MWM-4 OUTSIDE STORAGE OF RAW MATERIALS, BY-PRODUCTS, OR FINISHED PRODUCTS	☐	MWM-10 SORBENTS
☐	MWM-5 CONTAINMENT DIKING	☐	MWM-11 GELLING AGENTS
☐	MWM-6 CURBING		
STORM WATER ENGINEERING BMPs			
☐	SE-1 STORM WATER CONVEYANCES	☐	SE-7 VACUUM AND PUMP SYSTEMS
☐	SE-2 DIVERSION DIKES	☐	SE-8 PIPE SLOPE DRAINS
☐	SE-3 GRADED AREAS FOR PAVEMENT	☐	SE-9 SUBSURFACE DRAINS
☐	SE-4 COLLECTION BASINS	☐	SE-10 LEVEL SPREADERS
☐	SE-5 SUMPS	☐	SE-11 INFILTRATION TRENCHES
☐	SE-6 EXCAVATION PRACTICES	☐	SE-12 POROUS PAVEMENTS/CONCRETE GRIDS AND MODULAR PAVEMENTS
SEDIMENT AND EROSION CONTROL PRACTICES (PERMENANT)			
☐	SECP-1 SEDIMENT AND EROSION AND PREVENTION PRACTICES	☐	SECP-6 STREAM BANK STABILIZATION
☐	SECP-2 DUST CONTROL (INDUSTRIAL)	☐	SECP-7 MULCHING, MATTING AND NETTING
☐	SECP-3 VEGETATION PRACTICES	☐	SECP-8 PERMANENT SEEDING AND PLANTING

☐	SECP-4 PRESERVATION OF NATURAL VEGETATION	☐	SECP-9 SODDING
☐	SECP-5 BUFFER ZONES	☐	SECP-10 GRASSED SWALES
SEDIMENT AND EROSION CONTROL PRACTICES (TEMPORARY)			
☐	EC-1 DUST CONTROL (LAND DISTURBANCE AND DEMOLITION AREAS)	☐	EC-9 STORM DRAIN INLET PROTECTION
☐	EC-2 TEMPORARY SEEDING	☐	EC-10 SEDIMENT TRAPS
☐	EC-3 CHEMICAL STABILIZATION	☐	EC-11 TEMPORARY SEDIMENT BASINS
☐	EC-4 INTERCEPTOR DIKES AND SWALES	☐	EC-12 OUTLET PROTECTION
☐	EC-5 FILTER FENCES	☐	EC-13 CHECK DAMS
☐	EC-6 STRAW BALE BARRIERS	☐	EC-14 SURFACE ROUGHENING
☐	EC-7 BRUSH BARRIERS	☐	EC-15 GRADIENT TERRACES
☐	EC-8 GRAVEL OR STONE FILTER BERMS	☐	EC-16 VEGETATED FILTER STRIPS

ASC-1 GOOD HOUSEKEEPING

Good housekeeping involves using common sense to identify ways to maintain a clean and orderly facility and keep contaminants out of separate storm sewers. It includes establishing procedures to reduce the possibility of mishandling chemicals or equipment and training employees in good housekeeping techniques.

Good housekeeping requires that areas, which may contribute pollutants to storm water discharges, are maintained in a clean, orderly manner.

Operation and Maintenance

These practices make sure that processes and equipment are working well. Basic operation and maintenance best management practices (BMPs) incorporated in the good housekeeping program are:

- Regular pickup and disposal of loose garbage and waste material on site outside of active fill areas.

- Make sure equipment is working properly (Refer to Maintenance BMPs ASC-2).

- Routinely inspect for leaks or conditions that could lead to discharges of chemicals or contact of storm water with raw materials, intermediate materials, waste materials, or products (Refer to Visual Inspection BMPs ASC-3).

- Ensure that spill cleanup procedures are understood by employees (Refer to Spill Prevention and Response BMPs ASC-4).

Material Storage Practices

Improper storage can result in the release of materials and chemicals that can cause storm water runoff pollution. Proper storage technique BMPs incorporated into the good housekeeping program are:

- Provide adequate space to facilitate material transfer and easy access for inspections.

- Store containers, drums, and bags away from direct traffic routes to prevent accidental spills.

- Stack containers according to manufacturers' instructions to avoid damaging the containers from improper weight distribution.

- Store containers on pallets or similar devices to prevent corrosion of the containers which can result when containers come in contact with moisture on the ground.

- Assign the responsibility of hazardous material inventory to a limited number of people who are trained to handle hazardous materials.

Material Inventory Procedures

Improved material tracking and inventory practices can reduce the waste that results from overstocking and the disposal of outdated materials. Careful tracking of all ordered materials may also result in efficient materials use. Material Inventory Procedures incorporated in the good housekeeping program are listed below:

- Identify all chemical substances present at the facility. Review the site and the purchase orders for the previous year. List all of the chemical substances used at the facility, and then obtain the Material Safety Data Sheets (MSDSs) for each. Keep MSDSs available to all employees.

- Label all containers to show the name and type of substance, stock number, expiration date, health hazards, suggestions for handling, and first aid information.

- Clearly mark on the inventory hazardous materials that require special handling, storage, use, and disposal considerations.

The emergency control system should determine the amount of hazardous materials stored at a facility. Make sure that storage areas are designed to contain spills.

Employee Participation

Employees should be trained regularly in good housekeeping practices to reduce mishandling of chemicals/equipment.

ASC-2 PREVENTATIVE MAINTENANCE

The preventive maintenance program includes:

- Timely inspection and maintenance of storm water management devices (for example, cleaning catch basins).

- Inspection and testing of facility equipment and systems to uncover conditions that could cause breakdown or failures resulting in discharges of pollutants to surface waters.

- Proper maintenance of facility equipment and systems.

Preventive maintenance involves the regular inspection and testing of facility equipment and operational systems. These inspections should uncover conditions such as cracks or slow leaks which could cause breakdowns or failures that result in discharges of chemicals to storm sewers/ surface waters. The program should prevent breakdowns and failures by adjustment, repair or replacement of equipment. The preventive maintenance program includes the following elements:

- Identification of equipment, systems, and facilities and surrounding areas that must be inspected.

- Schedule for periodic inspections or tests of these equipment and systems.

- Appropriate and timely adjustment, repair or replacement of equipment and systems.

- Maintenance and updating of complete records on inspections, equipment and systems.

Identification of Equipment to Inspect

The first step is to identify which systems or equipment may malfunction and cause spills, leaks, or other situations that could lead to storm water runoff contamination. Identification of equipment as a Best Management Practice (BMP) will include inspection of the following as a minimum:

- Pipes
- Pumps
- Storage tanks and bins

- Pressure vessels
- Pressure release valves
- Process and material handling equipment
- Storm water management devices (catch basins, or other structural or treatment BMPs).

Schedule Routine Preventive Maintenance Inspections

Schedules will be set for routine inspections once equipment and areas have been identified. Examination for leaks, corrosion, support or foundation failure, or other forms of deterioration or leaks should be included. Look for spots or puddles of chemicals or fluid leaks and document any detection of smoke, fumes, or other signs of leaks. Periodic testing of facility equipment for structural soundness is a key element of preventive maintenance.

Preventive maintenance inspections must be conducted as part of regular visual inspections.

Equipment Repair or Replacement

Promptly repair or replace defective equipment found during inspections and tests.

Records on Preventive Maintenance

- Complete an equipment inspection form monthly.
- Record test results and follow up with corrective action.
- Make sure records are complete and detailed.
- These records will be kept with other visual inspection records as part of this Storm Water Pollution Prevention Plan (SWPPP).

ASC-3 VISUAL INSPECTIONS

Regular visual inspections are performed to verify that all of the elements of the plan are in place and working properly. The visual inspection program must include the following:

- Identification of qualified facility personnel who will inspect equipment and areas at appropriate intervals in the plan.
- Verification of corrective action.
- Maintenance of all inspection/records.

Areas to Inspect

- Areas around all equipment
- Areas where spills and leaks have occurred in the past
- Material storage areas (tank farms, drum storage)
- Outdoor material processing areas
- Material handling areas (loading, unloading, transfer)
- Waste generation, storage, treatment and disposal areas.

Inspection Of These Areas Will Be Made And Documented On A Monthly Basis.

Implementation of a Visual Inspection Plan

If the facility has no established inspection program, then a plan must be developed. Appropriate personnel are responsible for conducting the inspections. It is important to remember that the employees carrying out the visual inspection program should be properly trained, familiar with the storm water pollution prevention program, and knowledgeable about proper record keeping and reporting procedures.

Records of Inspections

Inspection records will note:

- When inspections were done
- Who conducted the inspection
- What areas were inspected
- What problems were found
- Corrective action
- Who has been notified

These records should be kept with the SWPPP. The Environmental Protection Agency's (EPA's) General Permit requires that records be kept until at least one year after coverage under the permit expires.

Visual Inspection Checklist

Note the minimum inspection items below:

- Corroded drums or drums without plugs or covers.
- Corroded or damaged tanks, tank supports, and tank drain valves.
- Corroded or leaking pipes.
- Leaking or improperly closed valves and valve fittings.
- Leaking pumps and/or hose connections.
- Broken or cracked dikes, walls or other physical barriers designed to prevent storm water from reaching stored materials.
- Windblown dry chemicals.
- Leaking or corroded components.

ASC-4 SPILL PREVENTION AND RESPONSE

Spills and leaks together are one of the largest industrial sources of storm water pollutants, and are in most cases avoidable. Establishing standard operating procedures such as safety and spill prevention procedures along with proper employee training can reduce accidental releases. Avoiding spills and leaks is preferable to cleaning them up, not only from an environmental standpoint, but because spills increase operating costs and lower productivity.

Identify Potential Spill Areas

As part of this Storm Water Pollution Prevention Plan (SWPPP), a list or inventory of materials handled, used, and disposed of, and a site map indicating the drainage area of each storm water outfall is included. Refer to drainage map with the locations of areas and activities with high material spill potential to determine where spills will most likely occur. Spill potential also depends on how materials are handled, the types and volumes of materials handled, and how materials are stored.

Material Handling Procedures and Storage Requirements

Through the process of developing various spill scenarios, ideas for eliminating or minimizing the spill or its impact will emerge. These solutions should be prioritized and adopted according to conditions of effectiveness, cost, feasibility, and ease of implementation. Following is a list of some suggested activities that may reduce the potential that spills will occur/impact storm water quality:

- Expand ways to recycle, reclaim, and/or reuse materials to reduce the volume brought into the facility.
- Install leak detection devices, overflow controls, and diversion berms.
- Use effective housekeeping practices.
- Perform regular visual inspections to identify signs of wear on tanks, drums, containers, and berms and to identify messy housekeeping or other clues that could lead to potential spills.
- Perform preventive maintenance on storage tanks, valves, pumps, pipes and other equipment that may be present.
- Use filling procedures for tanks/other equipment that minimize spills.

- Use material transfer procedures that reduce the chance of leaks/spills.
- Substitute less toxic or non-toxic materials for toxic materials.
- Provide appropriate security.

ASC-5 MANAGEMENT OF RUNOFF

Management of runoff is the consideration of appropriate traditional storm water management practices (practices other than those which control the source of pollutants) used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. Procedures determined to be reasonable and appropriate must be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges from industrial activity must be considered when determining reasonable and appropriate measures. Appropriate measures may include:

- Vegetated swales (vegetated depression used to transport, filter, and remove sediment).
- Reuse of collected storm water (such as for a process or as an irrigation source).
- Inlet controls (such as oil/water separators).
- Snow management activities.
- Infiltration devices.
- Wet detention/retention devices.

Many Best Management Practices (BMPs) are measures to reduce pollutants at the source before they have an opportunity to contaminate storm water runoff. Traditional storm water management practices can be used to direct storm water away from areas of exposed materials/ potential pollutants. Traditional storm water management practices can be used to direct storm water that contains pollutants to natural or other types of treatment locations. For example, using an oil/water separator on storm water that has oil and grease will remove some of the oil and grease before the storm water leaves the site. Permits will generally not require specific storm water management practices since these practices must be selected on a case-by-case basis depending on the activities at the site.

ASC-6 PERSONNEL TRAINING

Employee training programs must inform personnel at all levels of responsibility of the components and goals of the Storm Water Pollution Prevention Plan (SWPPP). Training should address each component of the SWPPP, including how and why tasks are to be implemented. Similar Best Management Practice (BMP) topics include:

- Spill prevention and response.
- Good housekeeping.
- Material management practices.

Personnel training is essential for effective implementation of the SWPPP. The purpose of a training program is to teach personnel at all levels of responsibility the components and goals of the SWPPP.

The following sections discuss how to create an effective storm water pollution prevention training program.

Spill Prevention and Response

Spills can occur from equipment and containers containing petroleum products (gas, diesel fuel, oil, lubricating grease, hydraulic fluids). ***Spills from these services must be repaired and cleaned up in accordance with accepted local, state and federal standards*.**

Good Housekeeping

All employees must be trained in proper good housekeeping practices. Training must include a thorough discussion with all employees on an annual basis. New employees must receive instruction prior to beginning work. Each employee must be briefed on the items below:

- Require regular vacuuming and/or sweeping of interior spaces; sweeping and/or wetting.

- Promptly clean up spilled materials to prevent polluted runoff.

- Identify places where brooms, vacuums, sorbents, foams, neutralizing agents, and other good housekeeping and spill response equipment are stored.

- Display signs reminding employees of the importance and procedures of good housekeeping.

- Discuss updated procedures and report on the progress of practicing good housekeeping at every meeting.

- Provide instruction on securing drums and containers and frequently checking for leaks and spills.

Materials Management Practices

All personnel must be trained to recognize all toxic and hazardous substances located at the facility. Personnel must be trained on:

- Proper organization and storage of materials.

- Identification of all toxic and hazardous substances stored, handled, and produced onsite.

All employee training must be documented on the appended form and maintained as a part of this Storm Water Pollution Prevention Plan (SWPPP).

ASC-7 RECORD KEEPING

Incidents such as spills or other discrepancies with other information describing the quality and quantity of storm water discharges must be included in the records. Inspections and maintenance activities must be documented and recorded in the plan. ***Records must be maintained for three years after the permit expires.***

Record Keeping and Reporting Procedures for Spills, Leaks, and Other Discharges

Records must include the following:

- The date and time of the incident, weather conditions, duration, cause, environmental problems, response procedures, parties notified, recommended revisions of the BMP program, operating procedures/equipment needed to prevent recurrence.

- Formal written reports. ***(Document all reports called in to the National Response Center in the event of a reportable quantity discharge).***

- A list of the procedures for notifying the appropriate personnel and the names and telephone numbers of responsible personnel.

All inspections must be kept on file as directed by the pollution prevention team. The team will be responsible for reviewing the inspection records and when necessary implement correction measures.

Records Retention

Records of spills, leaks, or other discharges, inspections, and maintenance activities must be retained for at least three (3) years after coverage expires under the permit.

ASC-8 PREVENTATIVE MONITORING PRACTICES

Preventive monitoring practices include the routine observation of a process or piece of equipment to ensure its safe performance and may also include the chemical analysis of storm water before discharge to the environment. Several types of monitoring systems are described below:

Automatic Monitoring System — In areas where overflows, spills and catastrophic leaks are possible, an automatic monitoring system is recommended. Some federal, state and local laws require such systems to be present if threats exist to the health and safety of personnel and the environment. For material management areas, monitoring may include liquid level detectors, pressure and temperature gauges, and pressure-relief devices. In material transfer, process, and material handling areas, automatic monitoring systems can include pressure drop shut off devices, flow meters, thermal probes, valve position indicators, and operation lights. Loading and unloading operations might use these devices for measuring the volume of tanks before loading, for weighing vehicles or containers, and for determining rates of flow during loading and unloading.

Automatic Chemical Monitoring — Measures the quality of plant runoff to determine whether discharge is appropriate or whether diversion to a treatment system is warranted. Such systems might monitor pH, turbidity, or conductivity. These parameters might be monitored in diked areas, sewers, drainage ditches, or holding ponds. Systems can also be designed to signal automatic diversion of contaminated storm water runoff to a holding pond (a valve or a gate could be triggered by a certain pollutant in the storm water runoff).

Manned Operations — In material transfer areas and process areas, personnel can be stationed to watch over the operations so that any spills or mismanagement of materials can be corrected immediately. This is particularly useful at loading and unloading areas where vehicles or equipment must be maneuvered into the proper position to unload.

Nondestructive Testing — Some situations require that a storage tank or a pipeline system be tested without being physically moved or disassembled. The structural integrity of tanks, valves, pipes, joints, welds, or other equipment can be tested using nondestructive methods. Acoustic emission tests use high frequency sound waves to draw a picture of the structure to reveal cracks, malformations, or other structural damage. Another type of testing is hydrostatic pressure testing. During pressure testing, the tank or pipe is subjected to pressures several times the normal pressure. A loss in pressure during the testing may indicate a leak or some other

structural damage. Tanks and containers should be pressure tested as required by federal, state, or local regulations.

Automated monitoring systems should be placed in an area where personnel can easily observe the measurements. Alarms can be used in conjunction with the measurement display to warn personnel. Manned operations should have communication systems available for getting help in case spills or leaks occur. Especially sensitive or spill prone areas may require back-up instrumentation in case the primary instruments malfunction.

Mechanical and electronic equipment should be operated and maintained according to the manufacturers' recommendations. Equipment should be inspected regularly to ensure proper and accurate operation.

The pollution prevention team, in consultation with a certified safety inspector, should evaluate system monitoring requirements to decide which systems are appropriate based on hazard potential.

Advantages of Preventive Monitoring Practices	**Disadvantages of Preventive Monitoring Practices**
• Pressure and vacuum testing can locate potential leaks or damage to vessels early. The primary benefit of such testing is in ensuring the safety of personnel, but it also has secondary benefits including prevention of storm water contamination. • Automatic system monitors allow for early warnings if a leak, overflow, or catastrophic incident is imminent. • Manning operations, especially during loading and unloading activities, is effective and generally inexpensive. • The primary benefit of nondestructive testing is in ensuring the safety of personnel, but it also has secondary benefits including early detection of the potential for contaminating storm water runoff.	• Plant personnel often do not have the expertise to maintain automatic equipment. • Automatic equipment can fail without warning. • Automated process control and monitoring equipment may be expensive to purchase and operate.

ASC-9 SECURITY

Setting up a security system will prevent an accidental or intentional release of materials to storm water runoff as a result of vandalism, theft, sabotage, or other improper uses of facility property. Security personnel should be trained about the specifics of the Storm Water Pollution Prevention Plan (SWPPP). Routine patrol, lighting, and access control are discussed below as possible measures to include in the facility's security system and are measures that can be used at any facility.

Security information should be included in the existing training required to instruct personnel about where and how to patrol areas within the facility. Instruction should also include what to look for in problem areas and how to respond to problems. During routine patrol, security personnel can actively search the facility for indications of spills, leaks, or other discharges; respond to any disturbance resulting from intruders or inappropriate facility operations; and generally work as a safeguard to prevent unexpected events.

Sufficient lighting throughout the facility during daytime and night hours make it easier to get to equipment during checks and will make it easy to detect spills and leaks that might otherwise be hidden. Routine patrols are easier with proper lighting.

Controlling site access is an important part of security, activity and traffic control. Signs, fencing, guard houses, and visitor clearance requirements should be considered to control site access.

- Signs are the simplest, most inexpensive method of access control, but they are limited in their actual control since they provide no physical barriers and require that people obey them voluntarily.

- Fencing provides a physical barrier to the facility site and an added means of security.

- Guard houses used with visitor rules make sure that only authorized personnel enter the site.

- Traffic signs are also useful. Restricting vehicles to paved roads and providing direction and warning signs can help prevent accidents. Where restricting vehicles to certain pathways is

not possible, it is important to ensure that all aboveground valves and pipelines are well marked.

Advantages of Security	Disadvantages of Security
• Provides a preventive safeguard to operational malfunctions or other facility disturbances (routine patrols) • Allows easier detection of vandals or thieves (lighting) • Prevents spills by providing good visibility (lighting) • Prevents unauthorized access to facility (access control)	• May not be feasible for smaller facilities • May be costly (installation of lighting systems) • May increase energy costs as a result of additional lighting • May not be feasible to have extensive access controls at smaller facilities

ASC-10 AREA CONTROL PROCEDURES

The activities conducted at an industrial site often result in the materials being deposited on clothes or footwear and then being carried throughout the facility site. As a result, these materials may find their way into the storm water runoff.

Area control procedures involves practicing good housekeeping measures such as maintaining indoor or covered material storage and industrial processing areas. If the area is kept clean, the risk of accumulating material on footwear and clothing is reduced. In turn, the chance of left- over pollutants making contact with storm water and polluting surface water is minimized.

Area control measures can be used at any facility where materials may be tracked into areas where they can come in contact with storm water runoff. Areas can include material handling/storage/process areas.

Materials storage areas and industrial processing areas should be checked regularly to ensure that good housekeeping measures are being implemented. Cover-garments, foot mats, and other devices used to collect residual material near the area should be cleaned regularly.

Other effective practices include the following:

- Brushing off clothing before leaving the area.
- Stomping feet to remove material before leaving the area.
- Using floor mats at area exits.
- Using coveralls, smocks, and other overgarments in areas where exposure to material is of greatest concern (personnel should remove the overgarments before leaving the area).
- Posting signs to remind personnel about these practices.

Advantages of Area Control Procedures	Disadvantages of Area Control Procedures
• Are easy to implement • Result in a cleaner facility and improved work environment	• May be seen as tedious by employees and therefore may not be followed

ASC-11 SIGNS AND LABELS

Signs and labels identify problem areas or hazardous materials at a facility. Warning signs, often found at industrial facilities, are a good way to suggest caution in certain areas. Signs and labels can also provide instructions on the use of materials and equipment. Labeling is a good way to organize large amounts of materials, pipes, and equipment.

Labels tell material type and container contents. Accurate labeling can help quickly identify the type of material released so facility personnel can respond correctly.

Two effective labeling methods include color-coding and Department of Transportation (DOT) labeling. Color-coding is easily recognized by facility personnel and simply involves painting/coating or applying an adhesive label to the container. Color codes must be consistent throughout the facility to be effective, and signs explaining the color codes should be posted in all areas.

The DOT requires that labels be prominently displayed on transported hazardous and toxic materials. Labeling required by the DOT should be expanded to piping and containers, making it easy to recognize materials that are corrosive, radioactive, reactive, flammable, explosive, or poisonous.

Areas where they are particularly useful are material transfer areas, equipment areas, loading and unloading areas, or anywhere information might prevent contaminants from being releases to storm water.

Signs and labels should be visible and easy to read. Useful signs and labels might provide the following information:

- Names of facility and regulatory personnel, including emergency phone numbers, to contact in case of an accidental discharge, spill, or other emergency.

- Proper uses of equipment that could cause release of storm water contaminants.

- Types of chemicals used in high-risk areas.

- The direction of drainage lines/ditches and their destination: color, treatment or discharge.

- Information on a specific material.

- Refer to Occupational Safety and Health Administration (OSHA) standards for sizes and numbers of signs required for hazardous material labeling.

Hazardous chemicals might be labeled as follows:

- Danger
- Combustible
- Warning
- Caution
- Flammable
- Poisonous
- Caustic
- Corrosive
- Volatile
- Explosive

Periodic checks can ensure that signs are still in place and labels are properly attached. Signs and labels should be replaced and repaired as often as necessary.

Advantages of Signs and Labels	Disadvantages of Signs and Labels
• Inexpensive and easy to use	• Must be updated and maintained so they are legible

VEM-1 FUELING STATIONS

When storm water mixes with fuel spilled or leaked onto the ground, it becomes polluted with chemicals that are harmful to humans and to fish and wildlife. The following will help identify activities that can contaminate storm water and suggest Best Management Practices (BMPs) to reduce or eliminate storm water contamination from fueling stations. (Refer to the Exposure Minimization BMPs: MWM-5, MWM-6, VEM-5, SE-4, SE-5, MWM-7, VEM-6, and VEM-7).

Fuel station activities that can contaminate storm water:

- Spills and leaks that happen during fuel or oil delivery.

  Fuel overflows during storage tank filling are a major source of spills. Overflows can be prevented. Watch the transfer constantly to prevent overfilling and spills. Overfill prevention equipment automatically shuts off flow, restricts flow, or sounds an alarm when the tank is almost full. Federal regulations require overfill prevention equipment on all Underground Storage Tanks (USTs) installed after December 1988. For USTs installed before December 1988, overfill prevention equipment is required by 1998. Consider installing overflow prevention equipment sooner than the required deadline as part of your pollution prevention plan.

  Spills should be controlled immediately. Small spills can be contained using sorbent material such as oil dry or equivalent, straw, or sawdust. Do not wash petroleum spills into the storm drain or sanitary sewer. (Refer to Containment Diking and Curbing BMP WMW-5).

- Spills caused by "topping off fuel tanks".

  Gas pumps automatically shut off when the vehicle fuel tank is almost full to prevent spills. Trying to completely fill the tanks or topping off the tank often results in overfilling the tank and spilling fuel. Discourage topping off by training employees and posting signs.

- Allowing rainfall on the fuel area or storm water to run onto the fuel area.

  Fueling areas can be designed to minimize spills, leaks, and incidental losses of fuel, such as vapor loss, from coming into contact with rain water:

- Build a roof over the fuel area.

- Pave the fuel area with concrete instead of asphalt. Asphalt soaks up fuel or can be slowly dissolved by fuel, engine fluids, and other organic liquids and the asphalt itself can become a source of storm water contamination.

- Allowing run-on to the fuel areas.

  Run-on is storm water generated from other areas that flows or "runs on" to your property or site. Run-on flowing across fueling areas can wash contaminants into storm drains. Run-on can be ***minimized*** by:

- Grading, berming, or curbing the area around the fuel site to direct run-on away from the fuel area.

- Locating roof downspouts so storm water is directed away from fueling areas.

- Using valley gutters to route storm water around fueling area.

- Hosing or washing down the fuel area.

  Cleaning the fueling area with running water should be ***avoided*** because the wash water will pick up fuel, oil, and grease and make it storm water. Consider using a damp cloth on the pumps and a damp mop on the pavement rather than a hose. ***Check with the local sewer authority about any treatment required before discharging the mop water or wash water to the sanitary sewer.***

The key to a successful storm water pollution prevention plan is getting employees interested in reducing waste generation.

Discuss pollution prevention with employees. They are most familiar with the operations that generate wastes and may have helpful waste reduction suggestions. Consider setting up an employee reward program to promote pollution prevention.

Wash water and storm water in fueling areas drain directly to the storm sewer without adequate treatment. Some types of oil/water separators installed at these locations can provide treatment to discharges from oil contaminated pavements, but this equipment is only effective when properly maintained.

SUMMARY OF FUELING STATION BMPs

- Consider installing spill and overflow protection.
- Discourage topping off of fuel tanks.
- Reduce exposure of the fuel area to storm water.
- Use dry cleanup methods for the fuel area.
- Use proper petroleum spill control.
- Encourage employee participation.

VEM-2 VEHICLE AND EQUIPMENT MAINTENANCE

Many vehicle and equipment maintenance operations use materials or create wastes that are harmful to humans and the environment. Storm water runoff from areas where these activities occur can become polluted by a variety of contaminants such as solvents and degreasing products, waste automotive fluids, oils, greases, acids, and caustic wastes. These and other harmful substances in storm water can enter water bodies through storm drains or through small streams where they can harm fish and wildlife.

The following will help find sources of storm water contamination from vehicle and equipment maintenance operations and to help personnel choose Best Management Practices (BMPs) that can reduce or eliminate these sources.

Activities that can Contaminate Storm Water

Engine repair and service:

- Parts cleaning
- Shop cleanup
- Spilled fuel, oil, or other materials
- Replacement of fluids (oil, oil filters, hydraulic fluids, transmission fluid, and radiator fluids).

Outdoor vehicle and equipment storage and parking:

- Dripping engine and automotive fluids from parked vehicles and equipment.

Disposal of materials or process wastes:

- Greasy rags
- Oil filters
- Air filters
- Batteries
- Spent coolant, degreasers, etc.

Parts Cleaning

Parts are often cleaned using solvents such as trichloroethylene, 1,1,1-trichloroethane or methylene chloride. Many of these cleaners are harmful and must be disposed of as a hazardous waste. Cleaning without using liquid cleaners whenever possible reduces waste. Scrape parts with a wire brush, or use a bake oven if one is available. Prevent spills and drips of solvents and cleansers to the shop floor. Perform all liquid cleaning at a centralized station so the solvents and residues stay in one area. If parts are dipped in liquid, remove them slowly to avoid spills. Locate drip pans, drain boards, and drying racks to direct drips back into a sink or fluid holding tank for reuse.

Non-toxic or Less Toxic Cleaners or Solvents

Eliminate or reduce the number or amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials, if possible. For example:

- Use non-caustic (non-corrosive) detergents instead of caustic cleaning agents for parts cleaning (ask suppliers about alternative cleaning agents).

- Use detergent-based or water-based cleaning systems in place or organic solvent degreasers.

- Replace chlorinated organic solvents (1,1,1-trichloroethane, methylene chloride, etc.) with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of but are by no means harmless themselves. Check the list of active ingredients to see whether it contains chlorinated solvents.

- Choose cleaning agents that can be recycled.

Contact suppliers or trade journals for more product specific waste minimization suggestions.

Work Areas and Spills that are Washed or Hosed Down with Water

Clean up leaks, drips, and other spills without using large amounts of water. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills. Consider the following BMPs:

- Avoid hosing down work areas.

- Collect leaking or dripping fluids in drip pans or containers. If different liquids are kept separate, the fluids are easier to recycle.

- Keep a drip pan under the vehicle while unclipping hoses, unscrewing filters, or removing other parts. Use a drip pan under any vehicle that might leak while it is being worked on to keep splatters or drips off the shop floor.

- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave full drip pans or other open containers lying around.

- Locate waste and recycling drums in properly controlled areas of the yard, preferably areas with a concrete slab and secondary containment.

Spills or Materials that are Washed or Poured Down the Drain

Do not pour liquid waste into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections. Used or leftover cleaning solutions, solvents, and automotive fluids and oil are often toxic and should not be put into the sanitary sewer. Be sure to dispose of these materials properly or find opportunities for reuse and recycling. ***If it is uncertain of how to dispose of chemical wastes, contact state hazardous waste management agency or the Resource Conservation and Recovery Act (RCRA) hotline at (800) 424-9346.*** Post signs at sinks to remind personnel, and paint stencils at outdoor drains to notify personnel and others not to pour liquid waste down drains.

Oil Filters Should Be Completely Drained Before Recycling or Disposal

Oil filters disposed of in trash cans or dumpsters can leak oil and subsequently contaminate storm water. Place the oil filter in a funnel over the waste oil recycling or disposal collection tank to drain excess oil before disposal. Oil filters can be crushed and recycled; ask oil suppliers or recyclers about recycling oil filters as an alternative to disposal.

Incoming Vehicles and Equipment Should be Checked For Leaking Oil and Fluids

Park vehicles indoors or under a roof, if possible, so storm water does not contact the area. If vehicles are parked outdoors prior to repair, watch them closely for leaks.

Put pans under leaks to collect fluids for proper recycling or disposal. Keeping leaks off the ground reduces the potential for storm water contamination and reduces cleanup time and costs. If the vehicle or equipment is to be stored outdoors, oil and other fluids should be drained first.

Designate a special area to drain and replace motor oil, coolant, and other fluids, where there are no connections to the storm drain/sanitary sewer and drips and spills can be easily cleaned up.

Wrecked Vehicles or Damaged Equipment That Are Stored Onsite

Be especially careful with wrecked vehicles, whether kept indoors or out, as well as with vehicles kept onsite for scrap or salvage. Wrecked or damaged vehicles often drip oil and other fluids for several days.

- As the vehicles arrive, place drip pans under them immediately, even if suspected that all fluids have leaked out before the vehicles reaches the shop.

- Build a shed or temporary roof over areas where parked vehicles await repairs or salvage, especially if wrecked vehicles are handled. Build a roof over vehicles kept for parts.

- Drain all fluids, including air conditioner coolant, from wrecked vehicles and "parts" vehicles. Drain engines, transmissions, and other used parts.

- ***Store cracked batteries in a non-leaking secondary container.*** Do this with all cracked batteries, event if all the acid has been suspected to have drained out. ***If a battery is dropped, treat it as if it is cracked.*** Put in into the containment area until it is verified that it is not leaking.

Recycle Any or All of The Following:

- Degreasers
- Used oil or oil filters
- Antifreeze
- Cleaning solutions
- Automotive batteries
- Hydraulic fluid.

All of these materials can be either recycled onsite or sent offsite for recycling. Some recycling options, ranked by level of effort required, follow:

Least Effort:

- Arrange for collection and transportation of batteries, used oil and other fluids, cleaning solutions, and degreasers to a commercial recycling facility. This requires that wastes are separated and stored until they are picked up by the recycling company.

- "Dirty" solvent can be reused. Presoak dirty parts in used solvent before cleaning the parts in fresh solvent.

Moderate Effort:

- Used oil, antifreeze, and cleaning solutions can be recycled onsite using a filtration system that removes impurities and allows the fluid to be reused. Filtration systems are commercially available.

Most Effort:

- Install an onsite solvent recovery unit. If the facility creates large volumes of used solvents, consider purchasing or leasing an onsite still to recover the solvent for reuse. ***Contact the state hazardous waste management agency for more information about onsite recycling of used solvents.***

Reduce the Number of Different Solvents Used

Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Sometimes, one solvent can perform a job as well as two different solvents.

Separate Wastes

Separating wastes allows for easier recycling and may reduce treatment costs. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents (like 1,1,1-trichloroethane) separate from non-chlorinated solvents (kerosene and mineral spirits). Proper labeling of all wastes and materials will help accomplish this goal (Refer to Signs and Labels BMP ASC-11).

Recycled Products

Many products made of recycled (refined or purified) materials are available. Engine oil, transmission fluid, antifreeze, and hydraulic fluid are available in recycled form. Buying recycled products supports the market for recycled materials.

SUMMARY OF VEHICLE MAINTENANCE AND REPAIR BMPs

- Check for leaking oil and fluids.
- Use non-toxic or low-toxicity materials.
- Drain oil filters before disposal or recycling.
- Do not pour liquid waste down drains.
- Recycle engine fluids and batteries.
- Isolate and label wastes.
- Buy recycled products.

VEM-3 PAINTING OPERATIONS

Many painting operations use materials or create wastes that are harmful to humans and the environment. Storm water runoff from areas where these activities occur can become polluted by a variety of contaminants such as solvents and dusts from sanding and grinding that contain toxic metals like cadmium and mercury. These and other potentially harmful substances in storm water can enter water bodies directly through storm drains where they can harm fish and wildlife.

The following will help identify potential sources of storm water contamination from painting operations on site and Best Management Practices (BMPs) that can reduce or eliminate these sources. Implementing this section can help eliminate, reduce, or recycle pollutants that may otherwise contaminate storm water.

Painting Activities that can Contaminate Storm Water:

- Painting and paint removal.
- Sanding or paint stripping.
- Spilled paint or paint thinner.

Prevent Paint Wastes from Contaminating Storm Water Runoff

Use tarps and vacuums to collect solid wastes produced by sanding or painting. Tarps, drip pans, or other spill collection devices should be used to collect spills of paints, solvents, or other liquid materials. These wastes should be disposed of properly to keep them from contaminating storm water.

Contain Wastes From Sanding

Prevent paint chips from coming into contact with storm water. Paint chips may contain hazardous metallic pigments or biocides(pesticides). Reduce contamination of storm water with paint dust and chips from sanding by the following practices:

- Avoid sanding in windy weather when possible.

- Enclose outdoor sanding areas with tarps or plastic sheeting. Be sure to provide adequate ventilation and personal safety equipment. After sanding is complete, collect the waste and dispose of it properly.

- Keep workshops clean of debris and grit so that the wind will not carry any waste into areas where it can contaminate storm water.

- Move the activity indoors if it can be performed safely.

Inspect Parts Before Painting

Inspect the part or vehicle to be painted to ensure that it is dry, clean, and rust free. Paint sticks to dry, clean surfaces, which in turn means a better, longer-lasting paint job.

Use Painting Equipment that Creates Little Waste

As little as 30 percent of the paint may reach the target from conventional airless spray guns; the rest is lost as overspray. Paint solids from overspray are deposited on the ground where they can contaminate storm water. Other spray equipment that delivers more paint to the target and less overspray should be used:

- Electrostatic spray equipment
- Air-atomized spray guns
- High-volume/low-pressure spray guns
- Gravity-feed guns.

Train Personnel to Use Spray Equipment Correctly

Operator training can reduce overspray and minimize the amount of paint solids that can contaminate storm water. Correct spraying techniques also reduce the amount of paint needed per job. If possible, avoid spraying on windy days. When spraying outdoors, use a drop cloth or ground cloth to collect and dispose of overspray.

Recycle Paint, Paint Thinner and/or Solvents

These materials can either be recycled onsite or sent offsite for recycling. Some recycling options ranked by the level of effort required are listed below.

Least Effort:

- Dirty solvent can be reused for cleaning dirty spray equipment and parts before equipment is cleaned in fresh solvent.

- Give small amounts of leftover paint to the customer for touchup.

Moderate Effort:

- Arrange for collection and transportation of paints, paint thinner, or spent solvents to a commercial recycling facility.

Most Effort:

- Install an onsite solvent recovery unit. If the facility creates large volumes of used solvents, paint, or paint thinner, consider buying or leasing an onsite still to recover used solvent for reuse. Contact the state hazardous waste management agency for more information about onsite recycling of used solvents.

Separate Wastes

Separating wastes makes recycling easier and may reduce treatment costs. Keep hazardous and non-hazardous wastes separate, and keep chlorinated solvents (like 1,1,1-trichloroethane) separate from non-chlorinated solvents (like petroleum distillate and mineral spirits). Check the Materials Safety Data Sheet (MSDS) for ingredients, or talk with waste haulers or recycling companies to learn which waste types can be stored together and which should be separated.

Reduce the Number of Solvents Used

Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Sometimes, one solvent can do a job as well as two different solvents.

Use Recycled Products

Many products made of recycled (refined or purified) materials are available. Buying recycled paints, paint thinner, or solvent products helps build the market for recycled materials.

SUMMARY OF PAINTING OPERATION BMP

- Inspect parts prior to painting.
- Contain sanding wastes.
- Prevent paint waste from contacting storm water.
- Proper interim storage of waste paint, solvents, etc.
- Evaluate efficiency of equipment.
- Recycle paint, paint thinner, and solvents.
- Segregate wastes.
- Buy recycled products.

VEM-4 VEHICLE AND EQUIPMENT WASHING

Washing vehicles and equipment outdoors or in areas where wash water flows onto the ground can pollute storm water. Wash water can contain high concentrations of oil and grease, phosphates, and high suspended solid loads (these and other potentially harmful substances can pollute storm water when deposited on the ground where they can be picked up by rainfall runoff). Vehicle wash water is considered to be a process wastewater and needs to be covered by a National Pollutant Discharge Elimination System (NPDES) permit.

The following will help find sources of storm water contamination from vehicle and equipment washing and to select Best Management Practices (BMPs) to reduce those sources. This section can help eliminate, reduce, or recycle pollutants that otherwise may contaminate storm water. (Refer to Vehicle Washing BMP VEM-8).

Vehicle and Equipment Washing Activities That Can Contaminate Storm Water:

- Outside equipment or vehicle cleaning (washing or steam cleaning).

- Wash water discharged directly to the ground or storm water drain.

Consider Using Phosphate-Free Biodegradable Detergents

Phosphates, which are plant nutrients, can cause excessive growth of nuisance plants in water when they enter lakes or streams in wash water. Contact suppliers about phosphate-free biodegradable detergents that are available on the market.

Vehicles, Equipment, or Parts that are Washed Over the Open Ground

Used wash water contains high concentrations of solvents, oil and grease, detergents, and metals. Try not to wash parts or equipment outside. Washing over impervious surfaces like concrete, blacktop, or hardpacked dirt allows wash water to enter storm drains directly or deposits contaminants on the ground, where they are washed into storm drains when it rains. Washing over pervious ground such as sand soils potentially can pollute groundwater. Therefore, small parts and equipment washing should be done over a parts washing container where the wash water can be collected and recycled or disposed of properly.

If washing large equipment or vehicles take place, and it is necessary to wash outside; designate a specific area for washing. This area should be bermed to collect the wastewater and graded to direct

the wash water to a treatment facility. Consider filtering and recycling vehicle wash water. If recycling is not practical, the wastewater can be discharged to the sanitary sewer.

SUMMARY OF VEHICLE AND EQUIPMENT WASHING BMPs

- Consider use of phosphate-free detergents.
- Use designated cleaning areas.
- Consider recycling wash water.

Personnel Involvement is the Key

Getting personnel interested in reducing waste is the key to a successful storm water pollution prevention plan. Discuss pollution prevention with your personnel. They are most familiar with the operations that generate wastes and may have helpful waste reduction suggestions. Consider setting up a personnel award program to promote pollution prevention.

VEM-5 DRIP PANS

Drip pans are small depressions or pans used to contain very small volumes of leaks, drips, and spills that occur at a facility. Drip pans can be depressions in concrete, asphalt, or other impenetrable materials or they can be made of metals, plastic, or any material that does not react with the dripped chemicals. Drip pans can be temporary or permanent.

Drip pans are used to catch drips from motors, valves, pipes, etc. so that the materials or chemicals can be cleaned up easily or recycled before they can contaminate storm water. Although leaks and drips should be repaired and eliminated as part of a preventive maintenance program, drip pans can provide a temporary solution where repair or replacement must be delayed. In addition, drip pans can be an added safeguard when they are positioned beneath areas where leaks and drips may occur.

Drip pans can be used at any industry where valves and piping are present and the potential for small volume leakage and dripping exist. When using drip pans, consider the location of the drip pan, weather conditions, the type of material to be used for the drip pan, and how it will be cleaned.

The location of the drip pan is important, because they must be inspected and cleaned frequently. Drip pans must be easy to reach and remove. In addition, take special care to avoid placing drip pans in precarious positions such as next to walkways, on uneven pavement/ground, or sitting on pipelines. Drip pans in these locations are easily overturned and may present a safety hazard, as well as an environmental hazard.

Weather conditions are also important factors. Heavy winds and rainfall move or damage drip pans because of their small size and their light weight (if not built-in). To prevent this, secure the pans by installing or anchoring them. Drip pans may be placed on platforms or behind wind blocks or tied down.

Employees must pay attention to the pans and empty them when they are nearly full for drip pans to be effective. Because of their small holding capacities, drip pans will easily overflow if not emptied. Also, recycling efforts can be affected if storm water accumulates in drip pans and dilutes the spilled material. It is important to have clearly specified and easily followed practices of reuse/recycle and/or disposal, especially the disposal of hazardous materials. Many facilities dump

the drip pan contents into a nearby larger volume storage container and periodically recycle the contents of the storage container.

Frequent inspection of the drip pans is necessary due to the possibility of leaks in the pan itself or in piping or valves that may occur randomly or irregular slow drips that may increase in volume. Conduct inspections ***before*** forecast rainfall events to remove accumulated materials and ***immediately*** after storm events to empty storm water accumulations.

Advantages of Drip Pans	Disadvantages of Drip Pans
• Inexpensive	• Contain small volumes only
• Easily installed and simple to operate	• Must be inspected and cleaned frequently
• Allow for reuse/recycling of collected material	• Must be secured during poor weather conditions
• Empty or discarded containers may be reused as drip pans	• Contents may be disposed of improperly unless facility personnel are trained in proper disposal methods

VEM-6 VEHICLE POSITIONING

Vehicle positioning is the practice of locating trucks or rail cars while transferring materials to prevent spills of materials onto the ground surface, which may then contaminate storm water runoff. Vehicle positioning is a simple and effective method of material spill prevention and yet it is commonly overlooked.

Vehicle positioning can be used at all types of industrial facilities. This practice is appropriate for any area where materials are transferred from or to vehicles, such as loading and unloading areas, storage areas, and material transfer areas. Use vehicle positioning in conjunction with other practices such as covering, sumps, drip pans, or loading and unloading by air pressure or vacuum where chemical spills are of concern.

The purpose of vehicle positioning is to locate vehicles in a stable and appropriate position to prevent problems, such as spills resulting from broken material storage containers, spills caused by vehicle movement during materials transfer activities, and spills caused by improperly located vehicles. Vehicles should also be positioned near containment or flow diversion systems to collect unexpected spills from leaks in transfer or connections. The following activities are included in this practice:

- Constructing walls that help in positioning the vehicles.
- Positioning vehicle either over a drain or on a sloped surface that drains to a containment structure.
- Outlining required vehicle positions on the pavement.
- Using wheel guards or wheel blocks.
- Posting signs requiring the use of emergency brakes.
- Requiring vehicles to shut off engines during materials transfer activities.

Advantages of Vehicle Positioning	Disadvantages of Vehicle Positioning
• Inexpensive • Easy and effective	• May require redesign of loading and unloading areas

VEM-7 LOADING AND UNLOADING BY AIR PRESSURE OR VACUUM

Air pressure and vacuum systems are commonly used for transporting and loading and unloading materials. These systems are simple to use and effective in transferring dry chemicals or solids from one area to another, but are less effective as the particles of material become more dense.

In an air pressure system, a safety-relief valve and a dust collector are used to separate the dry materials from the air and then release the air accumulated during transfer operations. In a vacuum system, a dust collection device and an air lock, such as a rotary gate or trap door feeder, are typically used.

The use of mechanical equipment that involves enclosed lines, such as those provided by air pressure (also referred to as pneumatic) and vacuum loading systems are effective methods for minimizing releases of pollutants into the environment. Because of the enclosed nature of the system, pollutants are not exposed to wind or precipitation and therefore have less potential to contaminate storm water discharges.

Air pressure and vacuum systems can be used at all types of industrial facilities. This equipment is located in material handling areas to use for storing, loading and unloading, transporting, or conveying materials.

Unlike many of the other BMPs discussed in this manual, air pressure and vacuum systems may be expensive because of the costs of purchasing the system and retrofitting the system to existing materials handling procedures. In many cases, these systems can be shipped to a facility and be installed onsite without contractor help. Manufacturer's recommendations should be followed closely to ensure proper installation. In other cases, systems may have to be designed specifically for a site. Proper design and installation are very important for air pressure and vacuum systems to be as effective as possible. The equipment may be weatherproof or, if not, consider enclosing or covering the equipment.

Conduct routine inspections of air pressure and vacuum systems. Regular maintenance is required of these systems, especially the dust collectors. Conduct maintenance activities based on manufacturers' recommendations. ***Inspect air pressure systems more frequently due to the greater potential for leaks to the environment.***

Advantages of Loading and Unloading by Air Pressure or Vacuum	Disadvantages of Loading and Unloading by Air Pressure or Vacuum
• Quick and simple • May be economical if materials can be recovered • Minimizes exposure of pollutants to storm water	• May be costly to install and maintain • May not be appropriate for some denser materials • May require site-specific design • Dust collectors may need an installation permit under the Clean Air Act

VEM-8 VEHICLE WASHING

Materials that accumulate on vehicles and then scatter across industrial sites represent an important source of storm water contamination. Vehicle washing removes materials such as site-specific dust and spilled materials that have accumulated on the vehicle. If not removed, residual material will be spread by gravity, wind, snow, or rainfall as the vehicles move across the facility site and off the site.

This practice is appropriate for any facility where vehicles come into contact with raw materials on site. If possible, vehicle washing areas should be located where the most vehicle activity occurs. Wastewater from vehicle washing should be directed away from process materials to prevent contact. Those areas include material transfer areas, loading and unloading areas, or areas located just before the site exit.

When considering the method of vehicle washing, consideration should be given to using a high-pressure water spray with no detergent additives. In general, water will adequately remove contaminants from the vehicle. If detergents are used, they may cause other environmental impacts. Phosphate or organic-containing compounds should be avoided.

All wash water should be directed into a sanitary sewer system when available. If the wash water is directed into the storm sewer system it will result in a non-storm-water discharge, thus requiring an application for a National Pollution Discharge Elimination System (NPDES) permit to cover the discharge.

Blowers or vacuums should be considered where the materials are dry and easily removed by air.

Advantages of Vehicle Washing	Disadvantages of Vehicle Washing
• Prevents dispersion of materials across the facility site	• May be costly to construct a truck washing facility
• Is necessary only where methods for transferring contained materials and minimizing exposure have not been successfully adopted and implemented	• May require a NPDES permit

MWM-1 LOADING AND UNLOADING MATERIALS

Loading/unloading operations usually take place outside on docks or terminals. Materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and be carried away by rainfall runoff or when the area is cleaned. Rainfall may wash off pollutants from machinery used to unload or load materials. The following will help find sources of storm water contamination from loading and unloading materials and choose Best Management Practices (BMPs) to reduce or eliminate those sources. (Refer to Loading and Unloading by Air Pressure or Vacuum BMP VEM-7).

Loading and Unloading Activities that can Contaminate Storm Water

- Pumping of liquids or gases from barge, truck or rail car to a storage facility or vice versa.
- Pneumatic transfer of dry chemicals to or from the loading and unloading vehicles.
- Transfer by mechanical conveyor systems.
- Transfer of bags, boxes, drums, or other containers by forklift, trucks, or other material handling equipment.

Tank Trucks and Material Delivery Vehicles Should Be Located Where Spills or Leaks Can Be Contained

Loading and unloading equipment and vehicles should be located so that leaks can be contained in existing containment and flow diversion systems.

Loading/Unloading Equipment Should Be Checked Regularly For Leaks

Check vehicles and equipment regularly for leaks, and fix any leaks promptly. Common areas for leaks are valves, pumps, flanges, and connections. Look for dust or fumes. These are signs that material is being lost during unloading/loading operations.

Loading/Unloading Docks or Areas Should Be Covered to Prevent Exposure to Rainfall

Covering loading and unloading areas, such as building overhangs at loading docks, can reduce exposure of materials, vehicles, and equipment to rain.

Loading/Unloading Areas Should Be Designed to Prevent Storm Water Run-On

Run-on is storm water created from other areas that flows or "runs on" to the property or site. Run-on flowing across loading/unloading areas can wash contaminants into storm drains. Run-on can be **minimized** by:

- Grading, berming, or curbing the area around the loading area to direct run-on away from the area.

- Placing roof downspouts so storm water is directed from loading sites and equipment and preferably to a grassy or vegetated area where the storm water can soak into the ground.

SUMMARY OF LOADING/UNLOADING OPERATION BMPs

- Contain leaks during transfer.

- Check equipment regularly for leaks.

- Limit exposure of material to rainfall.

- Prevent exposure of material to rainfall.

- Prevent storm water run-on.

MWM-2 LIQUID STORAGE IN ABOVEGROUND TANKS

Accidental releases of chemicals from aboveground liquid storage tanks can contaminate storm water with many different pollutants. Materials spilled, leaks, or lost from storage tanks may accumulate in soils or on other surfaces and be carried away by rainfall runoff. The following can help find sources of storm water contamination from aboveground storage tanks and select BMPs to reduce or eliminate those sources. (Refer to the Exposure Minimization and Exposure Mitigation BMPs: MWM-8, MWM-9, SE-6, SE-7, MWM-10 and MWM-11)

The most common causes of unintentional releases from tanks:

- External corrosion and structural failure.
- Installation problems.
- Spills and overfills due to operator error.
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves).
- Leaks or spills during pumping of liquids or gases from barges, trucks, or rail cars to a storage facility.

Storage Tanks That Contain Liquid Hazardous Materials, Hazardous Wastes, or Oil

Storage of oil and hazardous materials must meet specific standards set by Federal and state laws. These standards include Spill Prevention Control and Countermeasure (SPCC) plans, secondary containment, installation, integrity and leak detection monitoring, and emergency preparedness plans. Federal regulations set specific standards for preventing run-on and collecting runoff from hazardous waste storage, disposal, or treatment areas. These standards apply to container storage areas and other areas used to store, treat, or dispose of hazardous waste. If the collected storm water is a hazardous waste, it must be managed as a hazardous waste in accordance with all applicable state and Federal environmental regulations. ***To find out more about storage requirements, call the toll-free Environmental Protection Agency's (EPA) Resource Conservation and Recovery Act (RCRA) hotline at (800) 424-9346 or contact the state hazardous waste management agency.***

Operators Should be Trained in Correct Operating Procedures and Safety Activities

Well-trained personnel can reduce human errors that lead to accidental releases or spills.

Safeguards Should be Implemented Against Accidental Releases

Engineered safeguards can help prevent operator errors that may cause the accidental release of pollutants. Safeguards include:

- Overflow protection devices on tank systems to warn the operator or to automatically shut down transfer pumps when the tank reaches full capacity.

- Protective guards around tanks and piping to prevent vehicle or forklift damage.

- Clearly tagging or labeling of valves to reduce human error.

Tank Systems Should be Inspected and Tank Integrity Tested Regularly

Visually inspect the tank system to identify problem areas before they lead to a release. Correct any problems or potential problems as soon as possible. An audit of a newly installed tank system by a registered and specially trained professional engineer can identify and correct potential problems such as loose fittings, poor welding, and improper or poorly fitted gaskets. Operators should visually inspect the tank system on a routine basis after installation. Areas to inspect include tank foundations, connections, coatings, tank walls, and the piping system. Look for corrosion, leaks, straining of tank support structures from leaks, cracks, scratches in protective coatings, or other physical damage that may weaken the tank system. ***Integrity testing should be done periodically by a qualified professional.***

Tanks Should be Bermed or Surrounded by a Secondary Containment System

A secondary containment system around both permanent and temporary tanks allows leaks to be more easily detected and contains spills or leaks. Methods include berms, dikes, liners, vaults, and double-walled tanks.

SUMMARY OF BMPS FOR LIQUID STORAGE IN ABOVEGROUND TANKS

- Comply with applicable state and federal laws.
- Properly train personnel.
- Install safeguards against accidental releases.
- Routinely inspect tanks and equipment.
- Consider installing secondary containment.

MWM-3 INDUSTRIAL WASTE MANAGEMENT AREAS AND OUTSIDE MANUFACTURING

Storm water runoff from areas where industrial waste is stored, treated, or disposed of can be polluted. Outside manufacturing activities can also contaminate storm water runoff. Activities such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, or operations that use hazardous materials are particularly dangerous. Wastes spilled, leaked, or lost from waste management areas or outside manufacturing activities may build-up in soils or on other surfaces and be carried away by rainfall runoff. There is also a potential for liquid wastes from lagoons or surface impoundments to overflow to surface waters or soak the soil where they can be picked up by storm water runoff. Possible storm water contaminants include toxic compounds, oil and grease, paints or solvents, heavy metals, and high levels of suspended solids.

The best way to reduce the potential for storm water contamination from both waste management areas and outside manufacturing activities is to reduce the amount of waste that is created and, as a result, the amount that must be stored or treated. The following will help determine Best Management Practices (BMPs) that can eliminate or reduce the amount of toxicity of industrial wastes as well as minimize contamination of storm water from existing waste management areas. Waste reduction BMPs are appropriate for a wide range of industries and are designed to provide ideas on ways to reduce wastes.

Industrial waste management activities or areas that can contaminate storm water:

- Landfills
- Waste piles
- Wastewater and solid waste treatment and disposal:
    - Waste Pumping
    - Additions of treatment chemicals
    - Mixing
    - Aeration
    - Clarification
    - Solids dewatering

- Land application

Look for Ways to Reduce Waste at the Facility

The first step to reducing wastes is to assess activities at the facility. The assessment is designed to find situations at the facility where you can eliminate or reduce waste generation, emissions, and environmental damage. Starting a waste reduction program has many potential benefits. Some of these benefits are direct (cost savings from reduced raw material use), while others are indirect (avoided waste disposal fees).

Outside manufacturing activities or situations that can contaminate storm water:

- Processes or equipment that generate dusts, vapors, or emissions.
- Outside storage of hazardous materials or raw materials.
- Dripping or leaking fluids from equipment or processes.
- Liquid wastes discharged directly onto the ground or into the storm sewer.

Consider Waste Reduction BMPs

There are many different types of BMPs that can help eliminate or reduce the amount of industrial waste generated the facility. Some of these BMPs are listed below:

- Production planning and sequencing.
- Process or equipment modification.
- Raw material substitution or elimination.
- Loss prevention and housekeeping.
- Waste segregation and separation.
- Closed-loop recycling.

- Training and supervision.

- Reuse and recycling.

Industrial Waste Management and Outside Manufacturing Areas Should Be Checked Often for Spills and Leaks

By checking waste management areas for leaking containers or spills, you can prevent wastes from contaminating storm water. Look for containers that are rusty, corroded, or damaged. Transfer wastes from these damaged containers into safe containers. Close the lids on dumpsters to prevent rain from washing wastes out of holes or cracks in the bottom of the dumpster. In outside areas, look for leaking equipment (valves, lines, seals, or pumps) and fix leaks promptly. Inspect rooftop and other outdoor equipment (HVAC devices, air pollution control devices, transformers, piping) for leaks or dust concentrations.

Industrial Waste Management Areas or Manufacturing Activities Should Be Covered, Enclosed or Bermed

The best way to **avoid** contaminating storm water from existing waste management and manufacturing areas is to prevent storm water run-on or rain from entering or contracting these areas. This can be done by:

- Preventing direct contact with rain.

- Moving the activity indoors after ensuring that all safety concerns such as fire hazard and ventilation are addressed.

- Covering the area with a permanent roof.

- Covering waste piles with a temporary covering material such as a reinforced tarpaulin, polyethylene, polyurethane, polypropylene, or Hypalon.

- Minimizing storm water run-on by enclosing the area or building a berm around the area.

Vehicles Used to Transport Wastes to the Land Disposal or Treatment Site Should Be Equipped with Anti-Spill Equipment

Equipment transport vehicles equipped with spill prevention equipment can prevent spills of wastes during transport. Examples include:

- Vehicles equipped with baffles for liquid wastes.
- Trucks with sealed gates and spill guards for solid wastes.
- Trucks with tarps.

Use Loading Systems That Minimize Spills and Fugitive Losses Such as Dust or Mists

Wastes lost during loading or unloading can contaminate storm water. Vacuum transfer systems minimize waste loss.

Sediments or Wastes Should be Prevented From Being Tracked Offsite

Waste and sediment tracked offsite can end up on the streets where they are picked up by storm water runoff. Avoid this by using vehicles with specially designed tires, washing vehicles in a designated area before they leave the site, and controlling the wash water by providing a drainage system.

Minimized Storm Water Runoff From Land Disposal Sites

Take precautions to minimize the runoff of polluted storm water from land application sites. Some precautions are detailed as follows:

- Choose the land application site carefully. Characteristics that help prevent runoff include: slopes under six (6) percent, permeable soils, a low water table, locations away from wetlands or marshes, and closed drainage systems.
- Avoid applying waste to the site when raining, the ground is frozen or saturated with water. Grow grasses on areas dedicated to land disposal to stabilize the soils and reduce the volume of surface water runoff from the site.
- Maintain adequate barriers between the land application site and receiving waters.

- Erosion control techniques including mulching and matting, filter fences, straw bales, diversion terracing, or sediment basins.

- Perform routine maintenance to make sure that erosion control or site stabilization measures are working.

SUMMARY OF INDUSTRIAL WASTE MANAGEMENT AND OUTSIDE MANUFACTURING BMPS

- Conduct a waste reduction assessment.

- Institute industrial waste source reduction and recycling BMPs.

- Prevent runoff and run-on from contacting the waste management area.

- Minimize runoff from land application sites.

MWM-4 OUTSIDE STORAGE OF RAW MATERIALS, BY-PRODUCTS, OR FINISHED PRODUCTS

Raw materials, by-products, finished products, containers, and material storage areas exposed to rain/runoff can pollute storm water. Storm water can become contaminated by a wide range of contaminants (metals, oil, and greases) when solid materials wash off or dissolve into water, or by spills or leaks. Potential sources of storm water contamination and select Best Management Practices (BMPs) that can reduce or eliminate those sources are listed below.

Materials Should Be Protected From Rainfall, Run-on and Runoff

The best way to avoid contaminating storm water from outside material storage areas is to prevent rain or storm water run-on from coming in contact with the material(s). This can be done by:

- Storing the material indoors.
- Covering the area with a roof.
- Covering the material with a temporary covering made of polyethylene, polyurethane, polypropylene, or Hypalon.
- Minimizing storm water run-on by enclosing the area or building a berm around the area.

These materials should not be stored outside or in areas where they can contaminate storm water:

- Fuels
- Raw materials
- By-products
- Intermediates
- Final products
- Process residuals

SUMMARY OF BMPs FOR OUTSIDE STORAGE OF RAW MATERIALS, BY-PRODUCTS, OR FINISHED PRODUCTS

- Cover or enclose materials

MWM-5 CONTAINMENT DIKING

Containment dikes are temporary or permanent earth or concrete berms or retaining walls that are designed to hold spills. Diking, one of the most common types of containment, is an effective method of pollution prevention for aboveground liquid storage tanks and rail car or tank truck loading and unloading areas. Diking can provide one of the best protective measures against the contamination of storm water because it surrounds the area of concern and holds the spill, keeping spill materials separated from the storm water outside of the diked area.

Diking can be used at any industrial facility but is most commonly used for controlling large spills or releases from liquid storage areas and liquid transfer areas.

Containment dikes should be large enough to hold an amount equal to the largest single storage tank at the particular facility plus the volume of rainfall. For rail car and tank truck loading and unloading operations, the diked area should be capable of holding an amount equal to any single tank truck compartment. Materials used to construct the dike should be strong enough to safely hold spilled materials. The materials used usually depend on what is available onsite and the substance to be contained, and may consist of earth (soil or clay), concrete, synthetic materials (liners), metal or other impervious materials. In general, strong acids and bases may react with metal containers, concrete, and some plastics, so where spills may consist of these substances, other alternatives should be considered. Some of the more reactive organic chemicals may also need to be contained with special liners. If there are any questions about storing chemicals in certain dikes because of their construction materials, refer to the Material Safety Data sheets (MSDSs).

Containment dikes may need to be designed with impervious materials to prevent leaking or contamination of storm water, surface, and groundwater supplies.

Similarly, uncontrolled overflows from dikes areas containing spilled materials or contaminated storm water should be prevented to protect nearby surface waters or groundwaters. Therefore, dikes should have either pumping systems (Refer to Sumps Best Management Practices (BMPs) SE-5) or vacuum trucks available to remove the spilled materials. When evaluating the performance of the containment system, you should pay special attention to the overflow system, since it is often the source of uncontrolled leaks. If overflow systems do not exist, accumulated storm water should be released periodically. Contaminated storm water should be treated prior to

release. Mechanical parts, such as pumps or even manual systems (slide gates, stopcock valves), may require regular cleaning and maintenance.

When considering containment diking as a BMP, consult local authorities about any regulations governing construction of such structures to comply with local and State requirements. Facilities located in a flood plain should contact their local flood control authority to ensure that construction of the dikes is permitted.

Inspections of containment dikes should be conducted during or after significant storms or spills to check for washouts or overflows. In addition, regular checks of containment dikes (testing to ensure that dikes are capable of holding spills) is recommended. Soil dikes may need to be inspected on a more frequent basis.

Changes in vegetation, inability of the structure to retain storm water dike erosion, or soggy areas indicate problems with the dike's structure. Damaged areas should be patched and stabilized immediately, where necessary. Earthen dikes may require special maintenance of vegetation, such as mowing and irrigation.

Advantages of Containment Diking	Disadvantages of Containment Diking
• Contains spills, leaks, and other releases and prevent them from flowing into runoff conveyances, nearby streams, or underground water supplies. • Permits materials collected in dikes to be recycled. • Is a common industry practice for storage tanks and already required for certain chemicals	• May be too expensive for some smaller facilities • Requires maintenance • Could collect contaminated storm water, possibly resulting in infiltration of storm water to groundwater

MWM-6 CURBING

Like containment diking, curbing is a barrier that surrounds an area of concern. Curbing functions in a similar way to prevent spills and leaks from being releases to the environment by routing runoff to treatment or control areas. The terms curbing and diking are sometimes used interchangeably.

Because curbing is usually small scale, it cannot contain large spills like diking can, however, curbing is common at many facilities in small areas where handling and transferring liquid materials occur.

Curbing can be used at all industrial facilities. It is particularly useful in areas where liquid materials are transferred and as a storm water runoff control.

Common materials for curbing include earth, concrete, synthetic materials, metal, or other impenetrable materials. Asphalt is also a common material used in curbing.

For maximum efficiency of curbing, spilled materials should be removed immediately, to allow space for future spills. Curbs should have pumping systems, rather than drainage systems, for collecting spilled materials. Manual or mechanical methods, such as those provided by sump systems can be used to remove the material (Refer to Sumps Best Management Practice (BMP) SE-5). Curbing systems should be maintained through curb repair (patching and replacement).

When using curbing for runoff control, facilities should protect the berm by limiting traffic and installing reinforced berms in areas of concern.

Spills of materials that are stored within a curbed area can be tracked outside of that area when personnel and equipment leave the area. This tracking can be minimized by grading within the curbing to direct the spilled materials to a downslope of the curbing. This will keep the materials away from personnel and equipment that pass through the area. It will allow the materials to accumulate in one area making cleanup much easier.

Inspections should also be conducted before forecast rainfall events and immediately after storm events. If spilled or leaked materials are observed, cleanup should start immediately. This

will prevent overflows/contamination of storm water runoff. In addition, prompt cleanup of materials will prevent dilution by rainwater, which can adversely affect recycling opportunities. Inspection of curbed areas should be conducted regularly, to clear clogging debris. Because curbing is sized to contain small spill volumes, maintenance should also be conducted frequently to prevent overflow of any spilled materials.

Advantages of Curbing	Disadvantages of Curbing
• Excellent method to control run-on • Inexpensive • Easily installed • Materials spilled within curbed areas can be recycled • Exists as a common industry practice	• Not effective for holding large spills • May require more maintenance than diking

MWM-7 COVERING

Covering is the partial or total physical enclosure of materials, equipment, process operations, or activities. Covering certain areas or activities prevents storm water from coming into contact with potential pollutants and reduces material loss from wind blowing. Tarpaulins, plastic sheeting, roofs, buildings, and other enclosures are examples of covering that are effective in preventing storm water contamination. Covering can be temporary or permanent.

Covering is appropriate for outdoor material storage piles (stockpiles of dry materials, gravel, sand, compost, sawdust, wood chips, de-icing salt, and building materials) and areas where liquids and solids in containers are stored or transferred. Although it may be too expensive to cover or enclose all industrial activities, cover high-risk areas (identified during the storm water pollutant source identification). For example, cover chemical preparation areas, vehicle maintenance areas, areas where chemically treated products are stored, and areas where salts are stored.

If covering or enclosing the entire activity is not possible, the high-risk part of the activity can often be separated from other processes and covered. Another option that reduces the cost of building a complete enclosure is to build a roof over the activity. A roof may also eliminate the need for ventilation and lighting systems.

Evaluate the strength and longevity of the covering, as well as its compatibility with the material or activity being enclosed. When designing an enclosure, consider access to materials, their handling, and transfer. Materials that pose environmental and safety dangers because they are radioactive, biological, flammable, explosive, or reactive require special ventilation and temperature considerations.

Covering alone may not protect exposed materials from storm water contact. Place the material on an elevated, impermeable surface or build curbing around the outside of the materials to prevent problems from run-on of uncontaminated storm water from adjacent areas.

Frequently inspect covering, such as tarpaulins, for rips, holes, and general wear. Anchor the covering with stakes, tie-down ropes, large rocks, tires, or other easily available heavy objects.

Practicing proper materials management within an enclosure or underneath a covered area is essential. For example, floor drainage within an enclosure should be properly designed and connected to the wastewater sewer where appropriate and allowed.

If connection to an offsite wastewater sewer is considered, the local Publicly Owned Treatment Works (POTW) should be consulted to find out if there are any pretreatment requirements or restrictions that must be followed.

Advantages of Covering	Disadvantages of Covering
• Simple and effective	• Requires frequent inspection
• Usually inexpensive	• May pose health or safety problems if enclosure is built over certain activities

MWM-8 SWEEPING

Sweeping with brooms, squeegees, or other mechanical devices is used to remove small quantities of dry chemicals and dry solids from areas that are exposed to rain or storm water runoff. These areas may include dust or contaminant covered bags, drums containing remaining materials on their lids, areas containing enclosed or covered materials, and spills of dry chemicals/solids. Cleaning by sweeping with brooms is a low-cost practice that can be performed by all employees and require no special equipment or training.

Sweeping can be used at many material handling areas and process areas. Timing is an important consideration for all mitigative practices. To be effective as a storm water control, cleanup must take place before rainfall or contact with storm water runoff or before an outside area is hosed down.

Do not limit cleanup activities to those outside activities that are exposed to rainfall. In many cases, tracking of materials to the outside from areas that are enclosed or covered (on shoes) may also occur.

Store brooms appropriately and do not expose them to precipitation. In addition, rules of compatibility also apply. Do not use the same broom to clean up two chemicals that are incompatible. Determine the compatibility between the brooms themselves and the chemical of concern before using this practice. If necessary, consult appropriate Material Safety Data Sheet (MSDS) information.

Advantages of Sweeping	Disadvantages of Sweeping
• Inexpensive	• Labor-intensive practice
• Requires no special training	• Limited to small releases of dry materials
• Provides recycling opportunities	

MWM-9 SHOVELING

Shoveling is another manual cleanup method that is simple and low cost. Generally, shoveling can be used to remove larger quantities of dry chemicals and dry solids, as well as to remove wetter solids and sludges. Shoveling is also useful in removing accumulated materials from sites not accessible by mechanical cleanup methods.

Shoveling provides an added advantage over sweeping because cleanup methods are not limited to dry materials. In many cases, accumulated solids and sludges that are in ditches, sumps, or other facility locations can be effectively and quickly removed by shoveling.

Shovels can also be used to clean up contaminated frozen precipitation. Timing is an important consideration in any pollution reduction practice. Materials that could contaminate storm water runoff should be removed before any storm event.

Clean and store shovels properly. Plan for the transport and disposal or reuse of the shoveled materials.

Advantages of Shoveling	Disadvantages of Shoveling
• Inexpensive • Provides recycling opportunities • Can remediate larger releases and is effective for dry and wet materials	• Labor-intensive • Not an appropriate practice for large spills

MWM-10 SORBENTS

Sorbents are materials that are capable of cleaning up spills through the chemical processes of adsorption and absorption. Sorbents adsorb (an attraction to the outer surface of a material) or absorb (taken in by the material like a sponge) only when they come in contact with the sorbent materials. The sorbents must be mixed with a spill or the liquid must be passed through the sorbent. Often the particles are held together in structures called booms, pads, or socks. Sorbents include, but are not limited to, the following:

- Common Materials (clays, sawdust, straw, and fly ash) — Generally come in small particles that can be thrown onto a spill that is on a surface. The materials absorb the spill by taking up the liquid.

- Polymers (polyurethane and polyolefin) — Come in the form of spheres, beads, or foam tablets. These materials absorb a chemical spill by taking up the liquid into their open-pore structure.

- Activated Carbon — Comes in a powdered or granular form and can be mixed with liquids to remove pollutants. This sorbent works by adsorbing the organic to its surface and can be recycled and then reused by a process called regeneration.

- "Universal Sorbent Material" — Is a silicate glass foam consisting of rounded particles that can absorb the material.

Sorbents are useful Best Management Practices (BMPs) for facilities with liquid materials onsite. Timing is important for these practices to be effective as a storm water BMP. Cleanup must take place before a rainfall. Sorbents are often used in conjunction with curbing or other similar features to provide cleanup of small spills within a contained area.

"Universal Sorbent Materials" are suitable for use on many compounds including acids, alkalis, alcohols, aldehydes, arsenate, ketones, petroleum products, and chlorinated solvents.

Activated carbon is useful for adsorbing many organic compounds. Organics that are diluted in water can be passed through a column that is filled with the activated carbon material to remove the organics, or the activated carbon can be mixed in the water and can then be filtered out.

Polyurethane is good with chemical liquids such as benzene, chlorinated solvents, epichlorohydrin, and phenol. Polyolefin is used to remove organic solvents, such as phenol and various chlorinated solvents. The beads and spheres are usually mixed into a spill by use of a blower and then area skimmed from the top surface by use of an oil broom.

More common materials such as clay, sawdust, straw, and fly ash can be used for a liquid spill on a surface that is relatively impenetrable, and are usually spread over the spill area with shovels.

Booms, pads, and socks are also useful in areas where there are small liquid spills or drips or where small amounts of solids may mix with small amounts of storm water runoff. They can function both to absorb the pollutants from the storm water and restrict the movement of a spill. Socks are often used together with curbing to clean up small spills.

Because sorbents work by a chemical or physical reaction, some sorbents are better than others for certain types of spills. Therefore, the use of sorbents requires that personnel know the properties of the spilled material(s) to know which sorbent is appropriate. To be effective, sorbents must adsorb the material spilled but must ***NOT*** react with the spilled material to form hazardous or toxic substances. Always follow the manufacturers' recommendations.

For sorbents to be effective, they must be applied immediately in the release area. The use of sorbent material is generally very simple: the sorbent is added to the area of release, mixed well, and allowed to adsorb or absorb. Many sorbents are not reusable once they have been used. Proper disposal is required.

Advantages of Sorbents	**Disadvantages of Sorbents**
• Work in water environments (booms and socks) • Offer recycling opportunities (some types of sorbents)	• Require a knowledge of the chemical makeup of a spill (to choose the best sorbent) • Offer no recycling opportunities (some types of sorbents) • May be expensive practice for large spills • May create disposal problems and increase disposal costs by creating a solid waste and potentially a hazardous waste.

MWM-11 GELLING AGENTS

Gelling agents are materials that interact with liquids either physically or chemically (thickening or polymerization). Some of the typical gelling agents are polyetlectrolytes, polyacrylamide, butyistyrene copolymers, polyacryionitrile, polyethylene oxide, and a gelling agent referred to as the universal gelling agent which is a combination of these synthetics.

Gelling interacts with a material by concentrating and congealing it to become semisolid. The semisolid gel later forms a solid material, which can then be cleaned up by manual or mechanical methods. The Best Management Practice (BMP) of using a gelling agent is one of the few ways to effectively control a liquid spill before it reaches a receiving water or infiltrates into the soil and then groundwater.

Gelling agents are useful for facilities with significant amounts of liquid materials stored onsite. ***Gels cannot be used to clean up spills on surface water unless authorized by the U.S. Coast Guard or EPA Regional Response Team.***

Gels can be used to stop the liquid's flow on land, prevent its seeping into the soil, and reduce the surface spreading of a spill. Because of these properties, gels can reduce the need for extensive cleanup methods and reduce the possibility of storm water contamination from an uncontrolled industrial spill. As with sorbents, the use of gels simply involves the addition of the gel to the area of the spill, mixing well, and allowing the mass to congeal. To use gels correctly, however, personnel need to know the properties of the spilled materials so that they can choose the correct gel.

Timing is particularly important for gelling agent use. Gelling agents must be applied immediately after the spill to prevent the movement of materials. The use of gelling agents results in a large bulk of congealed mass that usually cannot be separated. As a result, this mass will need to be cleaned up by manual or mechanical methods and disposed of properly.

Advantages of Gelling Agents	Disadvantages of Gelling Agents
• Stop the movement of spilled or released liquid materials • Require no permanent structure	• May require knowledge of the spilled materials to select correct gelling agents • Usually offer no recycling opportunities • May be difficult to clean up • May create disposal problems/increase disposal costs by creating a solid waste and potentially a hazardous waste

SE-1 STORM WATER CONVEYANCES (Channels/Gutters/Drains/Sewers)

Storm water conveyances such as channels, gutters, drains, and sewers, collect storm water runoff and direct its flow. Storm water conveyances can be used for two different purposes; to keep uncontaminated storm water from coming in contact with areas of an industrial site where it may become contaminated with pollutants, and to direct the contaminated runoff to a treatment facility.

Storm water conveyances can be constructed or lined with many different materials, including: concrete, clay tiles, asphalt, plastics, metals, riprap, compacted soils, and vegetation. The type of material used depends on the function of the conveyance, which can be temporary or permanent.

Storm water conveyances usually work well at most industrial sites. Storm water can be directed away from industrial areas by collecting it in channels or drains before it reaches these areas. Additionally, conveyances can be used to collect storm water downhill from industrial areas and keep it separate from runoff that has not been in contact with those areas. When potentially contaminated storm water is collected in a conveyance like this, it can be directed to a treatment facility on the site if necessary. (If a pollutant is spilled, is should ***NOT*** be allowed to enter a storm water conveyance or drain system).

Conveyance systems are most easily installed during construction of a facility. Use of existing grades will decrease costs. Grades should be positive to allow for the continued movement of the runoff through the conveyance system; however, grades should not create an increase in velocity that increases erosion.

Storm water conveyances should be inspected for debris removal within 24 hours of rainfall. During periods of prolonged rainfall, inspect the conveyances daily, since heavy storms may clog or damage them. Repair damages to these structures as soon as possible.

Advantages of Storm Water Conveyances (Channels/Gutters/Drains/Sewers)	**Disadvantages of Storm Water Conveyances (Channels/Gutters/Drains/Sewers)**
• Direct storm water flows around industrial areas • Prevent temporary flooding of industrial site • Require low maintenance • Provide erosion resistant conveyance of storm water runoff • Provide long-term control of storm water flows	• Once flows are concentrated in storm water conveyances, they must be routed through stabilized structures all the way to their discharge to the receiving water or treatment plant to minimize erosion • May increase flow rates • May be impractical if there are space limitations • May not be economical, especially for small facilities or after a site has already been constructed

SE-2 DIVERSION DIKES

Diversion dikes or berms are structures used to block runoff from passing beyond a certain point. Temporary dikes are usually made with compacted soil and permanent dikes are constructed out of concrete, asphalt or similar materials.

Diversion dikes are used to prevent the flow of storm water runoff onto industrial areas. Limiting the volume of flow across industrial areas reduces the volume of storm water that may carry pollutants from the area, requiring treatment for pollutant removal. This BMP is suitable for industrial sites where significant volumes of storm water runoff tend to flow onto active industrial areas. Typically, dikes are built on slopes just uphill from an industrial area together with some sort of a conveyance such as a swale. The storm water conveyance is necessary to direct the water away from the dike so that the water will not pool and seep through the dike.

In planning for the installation of dikes, consider the slope of the drainage area, the height of the dike, the size of rainfall event it will need to divert, and the type of conveyance that will be used with the dikes. Steeper slopes result in higher volumes of runoff and higher velocities; therefore, the dike must be constructed to handle this situation. Remember that dikes are limited in their ability to manage large volumes of runoff.

Ideally, dikes are installed before industrial activity begins. However, dikes can be easily constructed at any time. Temporary dikes (usually made of soil) generally only last for 18 months or less, but they can be made into permanent structures by stabilizing them with vegetation. Vegetation is crucial for preventing the erosion of the dike.

Dikes should be inspected regularly for damage. This is especially important after storm events since a heavy rain may wash parts of a temporary dike away. Any necessary repairs should be made immediately to make sure the structure continues to function.

Advantages of Diversion Dikes	Disadvantages of Diversion Dikes
• Effectively limit storm water flows over industrial areas • Can be installed at any time • Are economically temporary structures, when built from soil onsite • Can be converted from temporary to permanent at any time	• Are not suitable for large drainage areas unless there is a gentle slope • May require maintenance after heavy rains

SE-3 GRADED AREAS FOR PAVEMENT

Land surfaces can be graded or graded and paved so that storm water runoff is directed away from industrial activity areas. The slope of the grade allows the runoff to flow, but limits the runoff from washing over areas that may be contaminated with pollutants. Like conveyances and dikes, graded areas can prevent runoff from contacting industrial areas and becoming contaminated with pollutants from these areas. Grading can be a permanent or temporary control measure.

Grading land surfaces is appropriate for any industrial site that has outdoor activities that may contaminate storm water runoff, such as parking lots or outdoor storage areas. Grading is often used with other practices, such as coverings, buffer zones, and other practices to reduce the runoff velocity and provide infiltration of the uncontaminated runoff, or to direct pollutant runoff to storm water treatment facilities.

Control and containment of runoff flows should be considered in the overall concept. The grading should control the uncontaminated flow by diverting it around areas that may have pollutants. The grading should also contain the contaminated flows or divert them to treatment facilities.

When regrading and paving an industrial area, the use of concrete paving instead of asphalt should be considered. This is especially important in potential spill sites or hazardous material storage areas. Asphalt absorbs organic pollutants and can be slowly dissolved by some fluids, thus becoming a possible source of contaminants itself. This control measure should be used with a cover, such as a roof, in areas where contaminants are of concern so that precipitation does not fall on the area and wash the contaminants down slope.

Inspect paving regularly for cracks that may allow contaminants to seep into the ground. Also, check to make sure that the drains receiving the storm water flow from the paved area remain unclogged with sediment or other debris so that low areas do not flood and wash over the areas where the contaminants may exist.

Advantages of Graded Areas and Pavement	Disadvantages of Graded Areas and Pavement
• Is effective in limiting storm water contact with contaminants	• May be uneconomical to regrade and resurface large areas
• Is relatively inexpensive and easily implemented.	• May not be effective during heavy precipitation

SE-4 COLLECTION BASINS

Collection basins, or storage basins, are permanent structures where large spills or contaminated storm water are contained and stored before cleanup or treatment. Collection basins are designed to receive spills, leaks, etc., that may occur and prevent these materials from being released to the environment. Unlike containment dikes, collection basins can receive and contain materials from many locations across a facility.

Collection basins are commonly confused with treatment units such as ponds, lagoons, and other containment structures. Collection basins differ from these structures because they are designed to temporarily store storm water rather than treat it.

Collection basins are appropriate for all industrial sites where space allows. Collection basins are particularly useful for areas that have a high spill potential.

The design and installation considerations for collection basins include sizing the basin either to hold a certain amount of spill or a certain size storm, or both. In designing the collection system, the type of material for the conveyances, compatibility of various materials to be carried through the system, and requirements for compliance with state and local regulations should be considered. Ideally, the system should function to route the materials quickly and easily to the collection basin.

When spills occur, the collection system must route the spill or storm water immediately to the collection basin. The collection system and basin may require cleaning after a spill is contained. Remove the collection basin contents immediately to prevent an unintentional release and recycle the spilled material as much as possible. Inspect the structure on a regular basis and after storm events or spills. Depending upon the types of pollutants that may be in the storm water, or are collected as spills, design of the basin may require a liner to prevent infiltration into the groundwater. ***Make sure that the installation of this Best Management Practice (BMP) does not violate State groundwater regulations.***

It is possible that the collection basin may handle combustible or flammable spilled materials, explosion-proof pumping equipment and controls or other appropriate precautions should be taken to prevent explosions or fires. ***Consult Occupational Safety and Health Administration (OSHA) and local safety codes/standards for specific requirements and guidance.***

Advantages of Collection Basins	Disadvantages of Collection Basins
• Store contaminated storm water until directed to a treatment facility	• May need a conveyance system for increased effectiveness
• Collect spills for recycling where materials are separated	• May collect materials that are not compatible
	• May reduce the potential for recycling materials by collecting storm water which dilutes the materials
	• May create groundwater problems if pollutants infiltrate into ground

SE-5 SUMPS

Sumps are holes or low areas that are structured so that liquid spills or leaks will flow down toward a particular part of a containment area. Frequently, pumps are placed in a depressed area and are turned on automatically to transfer liquids away from the sump when the level of liquids gets too high. Sumps can be temporary or permanent.

Sumps can be used at all facilities. Sumps are used with other spill containment and treatment measures and can be located almost anywhere onsite. Sumps are frequently located in low lying areas within material handling or storage areas.

When designing and installing a sump system, consider the pump location, function, and system alarms. Design and install the sump in the lowest lying area of a containment structure, allowing for materials to gather in the area of the sump. Construct the sump of impenetrable materials and provide a smooth surface so that liquids are funneled toward the pump. It may be appropriate to house the pumps in a shed or other structure for protection and stabilization.

There are numerous factors that should be considered when purchasing a pump. Base the size of the pump on the maximum expected volume to be collected in the containment structure. In some cases, more than one pump may be appropriate. Typically, pumps that can be submerged under the spill are the most appropriate for areas where large spills may occur and that may submerge the sump area. The viscosity (resistance to flow) of the material and the distance that the material must be pumped are also important considerations. Install pumps according the manufacturer's recommendations.

An alarm system can be installed for pumps that are used to remove collected materials. An alarm system can indicate that a pump should be operated by hand or that an automatically operated pump has failed to function. Ultimately, facility personnel should have some mechanism to take action to prevent spills from bypassing and overflowing containment structures.

The pumps and the alarm system used in the sump generally require regular inspections for service and maintenance of parts based on manufacturers' recommendations.

If it is possible that the sump may handle combustible or flammable spilled materials, explosion-proof pumping equipment and controls or other appropriate precautions should be taken

to prevent explosions or fires. ***Consult Occupational Safety and Health Administration (OSHA) and local safety codes/standards for specific requirements and guidance.***

Advantages of Sumps	Disadvantages of Sumps
• Provide a simple and quick collection method for recycling, reusing, or treating materials in a containment structure • Commonly used at industrial facilities	• Pumps may clog easily if not designed correctly • May require maintenance/servicing agreements with pump dealers • Costs for purchasing/replacing pumps may be high

SE-6 EXCAVATION PRACTICES

Excavation (removal of contaminated material) of released materials is typically conducted by mechanical equipment, such as bobcats and backhoes.

Excavation removes the materials of concern and any deposition of contaminants reducing the potential for storm water contamination. Mechanical cleanup methods are typically less precise than manual cleanup methods, resulting in reduced opportunities for recycle and reuse.

Excavation practices are most useful for large releases of dry materials and for areas contaminated by liquid material releases. In excavation, be sure that all of the contaminated material is removed. The excavated area should be stabilized as soon as possible after excavation is completed (paving, establishing vegetation).

Timing is an important consideration for all pollution reduction practices to be effective as a storm water control. Cleanup must take place ***before*** a rainfall event.

Conduct inspections, operations and maintenance in accordance with a manufacturer's recommendations, which may include the following:

- A schedule for inspection, maintenance, and servicing of the equipment
- Parts replacement, rotation, and lubrication specifications
- Procedures for evaluating all parts.

For any equipment used during cleanup, other considerations apply, including the following:

- Plows and backhoes should be stored appropriately with no exposure to precipitation
- Excavated materials should be properly handled and disposed of properly.

Advantages of Excavation Practices	Disadvantages of Excavation Practices
• Cost effective method for cleaning up dry materials release • Common and simple	• Less precise, resulting in less recycling and reuse opportunities

SE-7 VACUUM AND PUMP SYSTEMS

Vacuum and pump systems are effective for cleaning up spilled or exposed materials.

The benefits of vacuum and pump cleanup systems are simplicity and speed. With such systems, only the spilled materials need be collected. Also, these systems are often portable and can be used at many locations to clean up releases to the environment. Portable systems can usually be rented.

Vacuum and pump systems can be used at any industrial facility; wet/dry materials can be collected with these systems. Vacuum systems can be used in material handling areas and process areas.

Consider the area of use and the most appropriate size for the system since these systems can be portable.

Advantages of Vacuum and Pump Systems	Disadvantages of Vacuum and Pump Systems
• Remove materials by air pressure or vacuum quickly and simply • Collect materials accurately • Offer good recycling opportunities	• Initial capital cost • Require equipment maintenance

SE-8 PIPE SLOPE DRAINS

Pipe slope drains reduce the risk of erosion by discharging runoff to stabilized areas. Made of flexible or rigid pipe, they carry concentrated runoff from the top to the bottom of a slope that has already been damaged by erosion or is at high risk for erosion. They are also used to drain saturated slopes that have the potential for soil slides. Pipe slope drains can be either temporary or permanent depending on the method of installation and material used.

Pipe slope drains are used whenever it is necessary to convey water down a slope without causing erosion. They are especially effective before a slope has been stabilized or before permanent drainage structures are ready for use. Pipe slope drains may be used with other devices, including diversion dikes or swales, sediment traps, and level spreaders (used to spread out storm water runoff uniformly over the surface of the ground). Temporary pipe slope drains, usually flexible tubing or conduit, may be installed prior to the construction of permanent drainage structures. Permanent slope drains may be placed on or beneath the ground surface; pipes, sectional downdrains, paved chutes, or clay tiles may be used.

Paved chutes may be covered with a surface of concrete or other impermeable material. Subsurface drains can be constructed of concrete, PVC, clay tile, corrugated metal, or other permanent material.

The drain design should be able to handle the volume of flow. The effective life span of a temporary pipe slope drain is up to 30 days after permanent stabilization has been achieved. The maximum recommended drainage area for pipe slope drains is ten (10) acres.

The inlets and outlets of a pipe slope drain should be stabilized. This means that a flared end section should be used at the entrance of the pipe. The soil around the pipe entrance should be fully compacted. The soil at the discharge end of the pipe should be stabilized with riprap (a combination of large stones, cobbles, and boulders). The riprap should be placed along the bottom of a swale which leads to a sediment trapping structure or another stabilized area.

Pipe slope drains should be inspected on a regular schedule and after any major storm. Be sure that the inlet from the pipe is properly installed to prevent bypassing the inlet and undercutting the structure. If necessary, install a headwall, riprap, or sandbags around the inlet. Check the outlet point for erosion and check the pipe for breaks or clogs. Install outlet protection

(Refer to Outlet Protection Best Management Practice (BMP) EC-12) if needed and promptly clear breaks and clogs.

Advantages of Pipe Slope Drains	Disadvantages of Pipe Slope Drains
• Can reduce or eliminate erosion by transporting runoff down steep slopes or by draining saturated soils • Easy to install and require little maintenance	• Require that the area disturbed by the installation of the drain should be stabilized or it, too, will be subject to erosion • May clog during a large storm

SE-9 SUBSURFACE DRAINS

A subsurface drain is a perforated pipe or conduit placed beneath the surface of the ground at a designed depth and grade. It is used to drain an area by lowering the water table. A high water table can saturate soils and prevent the growth of certain types of vegetation. Saturated soils on slopes will sometimes "slip" down the hill. Installing subsurface drains can help prevent these problems.

There are two types of subsurface drains: relief drains and interceptor drains. Relief drains are used to de-water an area where the water table is high. They may be placed in a gridiron, herringbone, or random pattern. Interceptor drains are used to remove water where sloping soils are excessively wet or subject to slippage. They are usually placed as single pipes instead of in patterns. Generally, subsurface drains are suitable only in areas where the soil is deep enough for proper installation. They are not recommended where they pass under heavy vehicle crossings.

Drains should be placed so that tree roots will not interfere with drainage pipes. The drain design should be adequate to handle the volume of flow. Areas disturbed by the installation of a drain should be stabilized or they, too, will be subject to erosion. The soil layer must be deep enough to allow proper installation.

Backfill immediately after the pipe is placed. Material used for backfill should be open granular soil that is highly permeable. The outlet should be stabilized and should direct sediment-laden storm water runoff to a sediment trapping structure or another stabilized area.

Inspect subsurface drains on a regular basis and check for evidence of pipe breaks or clogging by sediment, debris, or tree roots. Remove blockage immediately, replace any broken sections, and restabilize the surface. If the blockage is from tree roots, it may be necessary to relocate the drain. Check inlets and outlets for sediment or debris. Remove and dispose of these materials properly.

Advantages of Subsurface Drains	Disadvantages of Subsurface Drains
• Provide an effective method for stabilizing wet sloping soils • An effective way to lower the water table	• May be pierced and clogged by tree roots • Should not be installed under heavy vehicle crossings • Cost more than surface drains because of the expenses of excavation for installation

SE-10 LEVEL SPREADERS

Level spreaders are devices used at storm water outlets to spread out collected storm water flows into sheetflow (runoff that flows over ground surface in a thin, even layer). Typically, a level spreader consists of a depression in the soil surface that spreads the flow onto a flat area across a gentle slope. Level spreaders then release the storm water flow onto level areas stabilized by vegetation to reduce speed and increase infiltration.

Level spreaders are most often used as an outlet for temporary or permanent storm water conveyances or dikes. Runoff that contains high sediment loads should be treated in a sediment trapping device prior to release into a level spreader.

The length of the spreader depends upon the amount of water that flows through the conveyance. Larger volumes of water need more spread to even out. Level spreaders are generally used with filter strips (Refer to Vegetated Filter Strips Best Management Practice (BMP) 65). The depressions are then seeded with vegetation (Refer to Permanent Seeding BMP SECP-8).

Level spreaders should not be used on soil that might erode easily. They should be constructed on natural soils and not on fill material. The entrance to the spreader should be level so that the flow can spread out evenly.

The spreader should be inspected after every large storm event to check for damage. Heavy equipment and other traffic should be kept off the level spreader because these vehicles may compact the soil or disturb the grade of the slope. If ponding erosion channels develop, the spreader should be regraded. Dense vegetation should be maintained and damaged areas reseeded as needed.

Advantages of Level Spreaders	Disadvantages of Level Spreaders
• Reduce storm water flow velocity, encourage sedimentation and infiltration • Relatively inexpensive to install	• Can easily develop "short circuiting" (concentration of flows into small streams instead of sheetflow over the spreader) because of erosion or other disturbance • Cannot handle large quantities of sediment-laden storm water

SE-11 INFILTRATION TRENCHES

An infiltration trench usually consists of a long, narrow excavation ranging from 3 to 12 feet deep. The trench is filled with stone, which allows for temporary storage of storm water runoff in the open spaces between the stones. The stored storm water infiltrates into the surrounding soil or drains into underground pipes through holes and is then routed to an outflow point. Infiltration trenches are designed to remove both fine sediments and soluble pollutants instead of larger, coarse pollutants.

Infiltration trenches should be restricted to areas with certain soil, groundwater slope, area, and pollutant conditions. Infiltration trenches will not operate well in soils that have high clay contents, silt/clay soils, sandy/clay loams, or soils that have been compacted. Trenches should not be sited over fill soils because such soils are unstable. Hardened soils are often not suitable for infiltration trenches because these types of soils do not easily absorb water. Infiltration practices in general should not be used to manage contaminated storm water.

The drainage area contributing runoff to a single trench should not exceed five (5) acres. Construction of trenches should not start until after all land-disturbing activities have ceased so that runoff with high levels of sediment does not fill in the structure.

If slopes draining into the trench are steeper than five (5) percent, the runoff will enter the trench too fast and will overwhelm the infiltration capacity of the soil, casing overflow. The depth from the bottom of the trench to the bedrock layer and the seasonal high water table must be at least three feet. Infiltration trenches may not be suitable in areas where there are cold winters and deep frost levels.

Pretreatment of runoff before it is channeled to the trench is important to efficient operation because pretreatment removes sediment, grit, and oil. Reducing the pollutant load in the runoff entering the trench lengthens trench life. One method of pretreatment is to install a buffer zone just above the trench to act as a filter (Refer to Buffer Zones Best Management Practice (BMP) SECP-5). In addition, a layer of filter fabric 1 foot below the bottom of the trench can be used to trap the sediments that get through the buffer strip. If excavation around the trenches is necessary, the use of light duty equipment will avoid compacting which could cause a loss of infiltration capability.

Infiltration trenches should be inspected at least once per year and after major rainfall events. Debris should be removed from all areas of the trench, especially the inlets and overflow channels. Dense vegetative growth should be maintained in buffer areas surrounding the trench.

Test wells can be installed in every trench to monitor draining times and provide information on how well the system is operating. ***Daily test well monitoring is necessary, especially after large storm events*****.** If the trench does not drain after 3 days, it usually means that the trench is clogged.

Advantages of Infiltration Trenches	**Disadvantages of Infiltration Trenches**
• Preserve the natural water balance of the site • Effective for small sites • Remove pollutants effectively	• Require high maintenance when sediment loads are heavy • Have short life span, especially if not maintained properly • May be expensive (cost of excavation and fill material)

SE-12 POROUS PAVEMENTS/CONCRETE GRIDS AND MODULAR PAVEMENTS

Porous pavement, concrete grids, and modular pavements allow storm water to infiltrate so that the speed and amount of runoff from a site can be reduced.

Porous pavement can be constructed of either asphalt or concrete. With porous asphalt pavement, runoff infiltrates through a porous asphalt layer into a stone "reservoir" layer. Storm water runoff filters through the stone reservoir into the underlying subsoil or drains into underground pipes through holes and is routed away. The bottom and sides of the stone reservoir are lined with filter fabric to prevent the movement of soils into the reservoir area.

Porous concrete pavement is made out of a special concrete mix that has a high number of open spaces between the particles and a coarse surface texture. These open spaces allow runoff to pass through the surface to lower levels. This type of pavement can be placed directly on graded soils. When a subbase is used for stability, six (6) inches of sand is placed under the concrete mixture. Up to six (6) inches of storm water can be held on the surface of the pavement and within the concrete.

Concrete grids and modular pavement are made out of precast concrete, poured-in-place concrete, brick, or granite. These types of pavements can also reduce the loading and concentration of pollutants in the runoff. Concrete grids and modular pavements are designed and/or constructed so that they have open spaces within the pavement through which storm water can infiltrate into the ground. These open spaces can be filled with gravel/sand/vegetation.

These structures are usually only suitable for low-volume parking areas (1/4 acre to 10 acres) and lightly used access roads. Areas that are expected to get moderate or high volumes of traffic or heavy equipment can use conventional pavements (for the heavy traffic areas) that are sloped to drain to areas with the porous pavements. These pavements are not effective in drainage areas that receive runoff containing high levels of sediment.

The soil types over which concrete grids and modular pavement are to be placed should allow for rapid drainage through the pores in the pavement. These pavements are not recommended for sites with slopes steeper than five (5) percent or sites with high water tables, shallow bedrock, fill soils, or localized clay lenses, which are conditions that would limit the ability of the runoff to

infiltrate into surface soils. For example, the water table and bedrock should be at least three (3) feet below the bottom of the stone reservoir. Porous pavement will not operate well in windy areas where sediment will be deposited on the porous pavement.

Construction of these pavements should be timed so that installation occurs on the site after other construction activities are finished and the site has been stabilized. As a result, sediments are less likely to be tracked or carried on to the surface.

Proper installation of these pavements requires a high level of construction expertise and workmanship. Only contractors who are familiar with the installation of these pavements should be used.

Designers of porous pavement areas should consider sediment and erosion control. Sediments must kept away from the pavement area because they can clog the pores. Controls to consider for sediments include a diversion berm (earthen mound) around the edge of the pavement area to block the flow of runoff from certain drainages onto the pavement, or other filtering controls such as silt fences. De-icing salt mixtures, sands, or ash also may clog pores and should not be used for snow removal. Signs should be posted to prohibit these activities.

The infiltration of storm water runoff may contaminate groundwater sources, these pavements are not suitable for areas close to drinking water wells (at least 100 feet away is recommended).

Maintenance of the surface is very important. For porous pavements, this includes vacuum sweeping at least four times per year followed by high-pressure hosing to reduce the chance of sediments clogging the pores of the top layer. Potholes and cracks can be filled with typical patching mixes unless more than ten (10) percent of the surface area needs repair. Spot clogging may be fixed by drilling half-inch holes through the porous pavement layer every few feet.

The pavement should be inspected several times the first few months after installation and then annually. ***Inspections after large storms are necessary to check for pools of water.*** These pools may indicate clogging. The condition of adjacent vegetated filter strips, silt fences, or diversion dikes should also be inspected.

Concrete grids and modular pavements should be designed in accordance with manufacturers' recommendations. Designers also need information on soils, depth to the water table, and storm water runoff quantity and quality.

Maintenance of concrete grids and modular pavements is similar to that of the porous pavements; however, turf maintenance such as mowing fertilizing, and irrigation may be needed where vegetation is planted in the open spaces.

Advantages of Porous Pavements/Concrete Grids and Modular Pavements	**Disadvantages of Porous Pavements/Concrete Grids and Modular Pavements**
• Provide erosion control by reducing the speed and quantity of the storm water runoff from the site • Provide some treatment to the water by removing pollutants • Reduce the need for curbing and storm sewer installation and expansion • Improve road safety by providing a rough surface • Provide some recharge to local aquifers • Cost effective because they replace more expensive/complex treatment systems	• Can be more expensive than typical pavements • Easily clogged with sediment/oil; however, pretreatment and proper maintenance will prevent this problem • May cause groundwater contamination • Not structurally suited for high-density traffic or heavy equipment • Asphalt pavements may break down if gasoline is spilled on the surface • Less effective when the subsurface is frozen

SECP-1 SEDIMENT AND EROSION AND PREVENTION PRACTICES

Sites where soils are exposed to water, wind or ice can have erosion and sedimentation problems. Sedimentation occurs when soil particles are suspended in surface runoff or wind and are deposited in streams or other water bodies.

Human activities can accelerate erosion by removing vegetation, compacting, or disturbing the soil, changing natural drainage patterns, and by covering the ground with impermeable surfaces (pavement, concrete, buildings). When the land surface is developed or "hardened" in this manner, storm water cannot infiltrate. This results in larger amounts of water moving more quickly across a site which can carry more sediment and other pollutants to streams and rivers.

Areas that may have a high potential for soil erosion are noted in the enclosed plan. This plan also includes areas with such heavy activity that plants cannot grow, soil stockpiles, stream banks, steep slopes, construction areas, demolition areas, and any area where the soil is disturbed, denuded (stripped of plants), and subject to wind and water erosion.

Seven ways to limit and control sediment and erosion:

- Leave as much vegetation (plants) onsite as possible.
- Minimize the time that soil is exposed.
- Prevent runoff from flowing across disturbed areas (divert the flow to vegetated areas).
- Stabilize the disturbed soils as soon as possible.
- Slow down the runoff flowing across the site.
- Provide drainage ways for the increased runoff (use grassy swales rather than concrete drains; refer to Grassed Swales BMP SECP-10).
- Remove sediment from storm water runoff before it leaves the site.

Using these measures to control erosion and sedimentation is an important part of storm water management. Selecting the best set of sediment and erosion prevention measures depends upon the nature of the activities onsite and other site-specific conditions.

The local Soil Conservation Service Office or County Extension Office can provide information on any special measures necessary to promote vegetation on severely eroded soils.

Vegetation Practices

Preserving existing vegetation or revegetating disturbed soil as soon as possible after construction is the most effective way to control erosion.

Four ways vegetation reduces erosion:

- Shields the soil surface from direct erosive impact of rain.
- Improves the soil's water storage porosity and capacity so more water can infiltrate into the ground.
- Slows the runoff and allows sediment deposits.
- Physically holds the soil in place with plant roots.

Vegetation cover can be grass, trees, shrubs, bark, mulch, or straw. Grasses are the most common type of cover used for revegetation because they grow quickly and provide erosion protection within days. Straw or mulch may be used during non-growing seasons to prevent erosion. Keep existing shrubs and trees because their established root systems help prevent erosion.

Vegetation and other site stabilization practices can be either temporary or permanent controls. Temporary controls provide a cover for exposed or disturbed areas for short periods of time or until permanent erosion controls are put in place. Permanent vegetative practices are used when activities that disturb the soil are completed or when erosion is occurring on a site that is otherwise stabilized.

SECP-2 DUST CONTROL (INDUSTRIAL)

Dust controls for material handling areas are controls that prevent pollutants from entering storm water discharges by reducing the surface and air transport of dust caused by industrial activities. Consider the following types of controls:

- Water spraying.
- Negative pressure systems (vacuum systems).
- Collector systems (bag and cyclone).
- Filter systems.
- Street sweeping.

The purpose of industrial dust control is to collect or contain dusts to prevent storm water runoff from carrying the dusts to the sewer collection system or to surface waters.

Dust control is useful in any process area, loading and unloading area, material handling areas, and transfer areas where dust is generated. Street sweeping is limited to areas that are paved.

Mechanical dust collection systems are designed according to the size of dust particles and the amount of air to be processed. Manufacturers' recommendations should be followed for installation (as well as the design of the equipment).

If water sprayers are used, dust-contaminated waters should be collected and taken for treatment. Areas will probably need to be resprayed to keep dust from spreading.

Two kinds of street sweepers are common: brush and vacuum. Vacuum sweepers are more efficient and work best when the area is dry.

Mechanical equipment should be operated according to the manufacturers' recommendations and should be inspected regularly.

Advantages of Dust Control (Industrial)	**Disadvantages of Dust Control (Industrial)**
• May cause a decrease of respiratory problems in employees around the site • May cause less material to be lost and may therefore save money • Provides efficient collection of larger dust particles (street sweepers)	• Generally more expensive than manual systems • May be impossible to maintain by plant personnel (the more elaborate equipment) • Labor and equipment intensive and may not be effective for all pollutants (street sweepers)

SECP-3 VEGETATION PRACTICES

Preserving existing vegetation or revegetating disturbed soil as soon as possible after construction is the most effective way to control erosion.

A vegetation cover reduces erosion potential in four ways:

- By shielding the soil surface from direct erosive impact of rain.
- By improving the soil's water storage porosity and capacity so more water can infiltrate into the ground.
- By slowing the runoff and allowing the sediment to drop out or deposit.
- By physically holding the soil in place with plant roots.

Vegetative cover can be grass, trees, shrubs, bark, mulch, or straw. Grasses are the most common type of cover used for revegetation because they grow quickly, providing erosion protection within days. Other soil stabilization practices such as straw or mulch may be used during non-growing seasons to prevent erosion. Newly planted shrubs and trees establish root systems more slowly, so keeping existing ones is a more effective practice.

Vegetative and other site stabilization practices can be either temporary or permanent controls. Temporary controls provide a cover for exposed or disturbed areas for short periods of time or until permanent erosion controls are put in place. Permanent vegetative practices are used when activities that disturb the soil are completed or when erosion is occurring on a site that is otherwise stabilized.

SECP-4 PRESERVATION OF NATURAL VEGETATION

The preservation of natural vegetation (existing trees, vines, brushes, and grasses) provides natural buffer zones. By preserving stabilized areas, it minimizes erosion potential, protects water quality, and provides aesthetic benefits. This practice is used as a permanent control measure.

This technique is applies to all types of sites. Areas where preserving vegetation can be particularly beneficial are floodplains, wetlands, stream banks, steep slopes, and other areas where erosion controls would be difficult to establish, install, or maintain.

Preservation of vegetation on a site should be planned before any site disturbance begins. Preservation requires good site management to minimize the impact of construction activities on existing vegetation. Clearly mark the trees to be preserved and protect them from ground disturbances around the base of the tree. Proper maintenance is important to ensure healthy vegetation that can control erosion. Different species, soil types, and climatic conditions will require different maintenance activities such as mowing, fertilizing, lining, irrigation, pruning, and weed and pest control.

Maintenance should be performed regularly, especially during construction. ***Some state/local regulations require natural vegetation to be preserved in sensitive areas. Consult the appropriate State/local agencies for more information on their regulations.***

Advantages of Preservation of Natural Vegetation	Disadvantages of Preservation of Natural Vegetation
• Can handle higher quantities of storm water runoff than newly seeded areas • Does not require time to establish (effective immediately) • Increases the filtering capacity because the vegetation and root structure are usually denser in preserved natural vegetation than in newly seeded or base areas • Enhances aesthetics • Provides areas for infiltration, reducing the quantity and velocity of storm water runoff • Allows areas where wildlife can remain undisturbed • Provides noise buffers and screens for onsite operations • Usually requires less maintenance (irrigation, fertilizer) than planting new vegetation	• Requires planning to preserve and maintain the existing vegetation • May not be cost effective with high land costs • May construct area available for construction activities

SECP-5 BUFFER ZONES

Buffer zones are vegetated strips of land used for temporary or permanent water quality benefits. Buffer zones are used to decrease the velocity of storm water runoff, which in turn helps to prevent soil erosion. Buffer zones are different from vegetated filter strips because buffer zone effectiveness is not measured by its ability to improve infiltration. The buffer zone can be an area of vegetation that is left undisturbed during construction, or it can be newly planted.

Buffer zones technique can be used at any site that can support vegetation. Buffer zones are particularly effective on floodplains, next to wetlands, along stream banks, and on steep, unstable slopes.

If buffer zones are preserved, existing vegetation, good planning, and site management are needed to protect against disturbances such as grade changes, excavation, damage from equipment, and other activities. Establishing new buffer strips requires the establishment of a good dense turf, trees, and shrubs. Careful maintenance is important to ensure healthy vegetation. The need for routine maintenance such as mowing, fertilizing, liming, irrigating, pruning, and weed and pest control will depend on the species of plants and trees involved, soil types, and climatic conditions. Maintaining planted areas may require debris removal and protection against unintended uses or traffic.

Many state/local storm water program or zoning agencies have regulations which define required or allowable buffer zones especially near sensitive areas such as wetlands. Contact the appropriate state/local agencies for their requirements.

Advantages of Buffer Zones	Disadvantages of Buffer Zones
• Provide aesthetic as well as water quality benefits • Provide areas for infiltration, which reduces amount and speed of storm water runoff • Provide areas for wildlife habitat • Provide areas for recreation • Provide buffers and screens for onsite noise if trees or large brushes are used • Low maintenance requirements • Low cost when using existing vegetation	• May not be cost effective to use if the cost of land is high • Are not feasible if land is not available • Require plant growth before they are effective

SECP-6 STREAM BANK STABILIZATION

Stream bank stabilization is used to prevent stream bank erosion from high velocities and quantities of storm water runoff. Typical methods include the following:

- Riprap — Large angular stones placed along the stream bank or lake.
- Gabion — Rock-filled wire cages used to create a new stream bank.
- Reinforced Concrete — Concrete bulkheads and retaining walls that replace natural stream banks and create a non-erosive surface.
- Log Cribbing — Retaining walls built of logs to anchor the soils against erosive forces; usually built on the outside of stream bends.
- Grid Pavers — Precast or poured-in-place concrete units placed along stream banks to stabilize the stream bank and create open spaces where vegetation can be established.
- Asphalt — Asphalt paving placed along the natural stream bank to create a non-erosive surface.

Stream bank stabilization is used where vegetative stabilization practices are not practical and where the stream banks are subject to heavy erosion from increased flows or disturbance during construction. Stabilization should occur before any land development in the watershed area. Stabilization can also be retrofitted when erosion of a stream bank occurs.

Stream bank stabilization structures should be planned and designed by a licensed professional engineer. ***Applicable Federal, State and local requirements should be followed, including Clean Water Act Section 404 regulations***. An important design feature of stream bank stabilization methods is the foundation of the structure; the potential for the stream to erode the sides and bottom of the channel should be considered to make sure the stabilization measure will be supported properly. Structures can be designed to protect and improve natural wildlife habitats. Only pressure-treated wood should be used in log structures. Permanent structures should be designed to handle expected flood conditions. A well-designed layer of stone can be used in many ways and in many locations to control erosion and

sedimentation. Riprap is either a uniform size or graded (different sizes) and is usually applied in an even layer throughout the stream. Reinforced concrete structures may require positive drainage behind the bulkhead or retaining wall to prevent erosion around the structure. Gabion and grid pavers should be installed according to manufacturers' recommendations.

Stream bank stabilization structures should be inspected during and after each large storm event. Structures should be maintained as installed. Structural damage should be repaired as soon as possible to prevent further damage or erosion to the stream bank.

Advantages of Stream Bank Stabilization	**Disadvantages of Stream Bank Stabilization**
• Can provide control against erosive forces caused by the increase in storm water flows created during land development	• Does not provide the water quality or aesthetic benefits that vegetative practices could
• Usually will not require as much maintenance as vegetative erosion controls	• Should be designed by qualified professional engineers, which may increase project costs
• May provide wildlife habitats	• May be expensive (materials costs)
• Forms a dense, flexible, self-healing cover that will adapt well to uneven surfaces (riprap)	• May require additional permits for structure
	• May alter stream dynamics which cause changes in the channel downstream
	• May cause negative impact to wildlife habitats

SECP-7 MULCHING, MATTING, AND NETTING

Mulching is a temporary soil stabilization or erosion control practice where materials such as grass, hay, woodchips, wood fibers, straw or gravel are placed on the soil surface. In addition to stabilizing soils, mulching can reduce the speed of storm water runoff over an area. When used together with seeding or planting, mulching can aid in plant growth by holding the seeds, fertilizers, and topsoil in place, by preventing birds from eating seeds, helping to retain moisture, and by insulating against extreme temperatures. Mulch mattings are materials (jute or other wood fibers) that have been formed into sheets of mulch that are more stable than normal mulch. Netting is typically made from jute, other wood fiber, plastic, paper, or cotton and can be used to hole the mulching and matting to the ground. Netting can also be used alone to stabilize soils while the plants are growing; however, it does not retain moisture or temperature well. Mulch binders (either asphalt or synthetic) are sometimes used instead of netting to hold loose mulches together.

Mulching is often used alone in areas where temporary seeding cannot be used because of the season or climate. Mulching can provide immediate, effective, and inexpensive erosion control. On steep slopes and critical areas such as waterways, mulch matting is used with netting or anchoring to hold it in place.

Mulch seeded and planted areas where slopes are steeper than 2:1, where runoff is flowing across the area, or when seedlings need protection from bad weather.

Use of mulch may or may not require a binder, netting, or the tacking of mulch to the ground. Effective netting and matting require firm, continuous contact between the materials and the soil. If there is no contact, the material will not hold the soil and erosion will occur underneath the material. Final grading is not necessary before mulching. Mulched areas should be inspected often to find where mulched material has been loosened or removed. Such areas should be reseeded (if necessary) and the mulch cover replaced immediately. Mulch binders should be applied at rates recommended by the manufacturer or, if asphalt is used, at rates of approximately 480 gallons per acre.

Advantages of Mulching, Matting, and Netting	Disadvantages of Mulching, Matting, and Netting
• Provide immediate protection to soils that are exposed and that are subject to heavy erosion • Retain moisture, which may minimize the need for watering • Require no removal because of natural deterioration of mulching and matting	• May delay germination of some seeds because cover reduces the soil surface temperature • Netting should be removed after usefulness is finished, than landfilled or composted

SECP-8 PERMANENT SEEDING AND PLANTING

Permanent seeding of grass and planting trees and brush provides stabilization to the soil by holding soil particles in place. Vegetation reduces sediment and runoff to downstream areas by slowing the velocity of runoff and permitting greater infiltration of the runoff. Vegetation also filters sediments, helps the soil absorb water, improves wildlife habitats, and enhances the aesthetics of a site.

Permanent seeding and planting is appropriate for any grades or cleared area where long-lived plant cover is desired. Some areas where permanent seeding is especially important are filter strips, buffer areas, vegetated swales, steep slopes, and stream banks. This practice is effective on areas where soils are unstable because of their texture, structure, a high water table, high winds, or steep slope. When seeding in northern areas during fall or winter, cover the area with mulch to provide a protective barrier against cold weather (Refer to Mulching Best Management Practice SECP-7). Seeding should also be mulched if the seeded area slopes 4:1 or more, if soil is sandy or clayey, or if weather is excessively hot or dry. Plant when conditions are most favorable for growth. When possible, use low-maintenance local plant species. Install all other erosion control practices such as dikes, basins, and surface runoff control measures before planting.

For this practice to work, it is important to select appropriate vegetation, prepare a good seedbed, properly time planting, and water and fertilize. Planting local plants during their regular growing season will increase the chances for success and may lessen the need for watering. Check seeded areas frequently for proper watering and growth conditions.

Topsoil should be used on areas where topsoils have been removed, where the soils are dense or impermeable, or where mulching and fertilizers alone cannot improve soil quality. Topsoiling should be coordinated with the seeding and planting practices and should not be planned while the ground is frozen or too set. Topsoil layers should be at least 2 inches deep (or similar to the existing topsoil depth).

Remove as little existing topsoil as possible to minimize erosion and sedimentation. All site controls should be in place before the topsoil is removed. If topsoils are brought in from another site, it is important that its texture is compatible with the subsoils onsite; for example, sandy topsoils are not compatible with clay subsoils.

Stockpiling of topsoils onsite requires good planning so soils will not obstruct other operations. If soil is to be stockpiled, consider using temporary seeding, mulching, or silt fencing to prevent or control erosion. Inspect the stockpiles frequently for erosion. After topsoil has been spread, inspect it regularly, and reseed or replace areas that have eroded.

Advantages of Permanent Seeding and Planting	**Disadvantages of Permanent Seeding and Planting**
• Improves the aesthetics of a site • Provides excellent stabilization • Provides filtering of sediments • Provides wildlife habitat • Relatively inexpensive	• May require irrigation to establish vegetation • Depends initially on climate and weather for success

SECP-9 SODDING

Sodding stabilizes an area by establishing permanent vegetation, providing erosion and sedimentation controls, and providing areas where storm water can infiltrate the ground.

Sodding is appropriate for any grades or cleared area that might erode and where a permanent, long-lived plant cover is needed immediately. Examples of where sodding can be used are buffer zones, stream banks, dikes, swales, slopes, outlets, level spreaders, and filter strips.

The soil surface should be fine-graded before laying down the sod. Topsoil may be needed in areas where the soil textures are inadequate (Refer to Permanent Seeding and Planting Best Management Practice (BMP) SECP-8). Lime and fertilizers should be added to the soil to promote good growth conditions. Sodding can be applied in alternating strips or other patterns, or alternate areas can be seeded to reduce expense. Sod should not be planted during very hot or wet weather. Sod should not be placed on slopes that are greater than 3:1 if they are to be mowed. If placed on steep slopes, sod should be laid with staggered joints/be pegged. In areas such as steep slopes or next to running waterways, chicken wire, jute, or other netting can be placed over the sod for extra protection against lifting (Refer to Mulching, Matting, and Netting BMP SECP-7). Rolled or compact immediately after installation to ensure firm contact with the underlying topsoil. Inspect the sod frequently after it is first installed, especially after large storm events, until it is established as permanent cover. Remove and replace dead sod. Watering may be necessary after planting and during periods of intense heat/lack of rain.

Advantages of Sodding	Disadvantages of Sodding
• Can provide immediate vegetative cover and erosion control • Provide more stabilizing protection than initial seeding through dense cover formed by sod • Produces lower week growth than seeded vegetation • Can be used for site activities within a shorter time than can seeded vegetation • Can be placed at any time of the year as long as moisture conditions in the soil area favorable, except when the ground is frozen	• Purchase and installation costs are higher than for seeding • May require continued irrigation if the sod is placed during dry seasons or on sandy soils

SECP-10 GRASSED SWALES

Grassed swales are vegetated depressions used to transport, filter, and remove sediments. Grassed swales control high runoff rates by reducing the speed of the runoff and by reducing the volume of the runoff through infiltration of the storm water. Pollutants are removed because runoff travels slowly and infiltrates into the soil and because the vegetation in the grass swale works as a filter or strainer.

Grassed swales are suitable for most areas where storm water runoff is low. Certain factors will affect the operation of grassed swales, including soil type, land features, and the depth of the soil from the surface to the water table (top of the drenched portion of the soil or bedrock layer). The soil must be permeable for runoff to be able to infiltrate well. Sandy soils will not hold vegetation well nor from a stable channel structure. Steep slopes will increase runoff rates and create greater potential for erosion. Storm water flows will not be easily absorbed where the water table is near the surface. Swales are most useful for sites smaller than 10 acres. Even without highly permeable soils, swales reduce velocity and are used for that reason.

Grassed swales usually do not work well for construction runoff because the runoff has high sediment loads.

The channel of the swale should be as level as possible to maximize infiltration. Side slopes in the swale should be designed to no steeper than 3:1 to minimize channel erosion. Plans should consider:

- Use of existing topography and existing drainage patterns.

- Highest flow rate is expected from a typical storm to determine the most practical size for the swale (in keeping with state or local requirements).

The swale should be lightly tilled before grass is planted, and a dense cover of grasses (seed or sod) should be planted. The location of the swale will determine the best type of vegetation.

Check dams may be installed in the swales to reduce runoff speed and increase infiltration.

Maintenance activities for the swales include those practices needed to maintain healthy, dense vegetation and to retain efficient infiltration and movement of the storm water into and through the swale. Periodic mowing, reseeding, and weed control are required to maintain pollutant removal efficiency. The swale and channel outlet should be kept free from sediment build-up, litter, brush, or fallen tree limbs.

Periodic inspections will identify erosion problems or damaged areas. Damaged or eroded areas of the channel should be repaired as soon as possible. Areas with damaged vegetation should be reseeded/replanted immediately.

Advantages of Grassed Swales	Disadvantages of Grassed Swales
• Easily designed and constructed	• Cannot control runoff from very large storms
• Provide moderate removal of sediments if properly constructed and maintained	• If they do not drain property between storms, can encourage nuisance problems such as mosquitoes, ragweed, dumping, and erosion
• May provide a wildlife habitat	• Not capable of removing significant amounts of soluble nutrients
• Inexpensive	• Cannot treat runoff with high sediment loadings
• Can replace curb and gutter systems	
• Can last for long periods of time if well maintained	

EC-1 DUST CONTROL (LAND DISTURBANCE AND DEMOLITION AREAS)

Dust controls for land disturbance and demolition areas are any controls that reduce the potential for particles being carried through air or water. Types of dust control are:

- Irrigation — Irrigation is a temporary measure involving a light application of water to moisten the soil surface. The process should be repeated as necessary.

- Minimization of Denuded Areas — Minimizing soil exposure reduces the amount of soil available for transport and erosion. Soil exposure can be lessened by temporary or permanent soil stabilization controls, such as seeding, mulching, topsoiling, crushed stone or coarse gravel spreading, or tree planting. Maintaining existing vegetation on a site will also help control dust.

- Wind Breaks — Windbreaks are temporary or permanent barriers that reduce airborne particles by slowing wind velocities (slower winds do not suspend particles). Leaving existing trees and large shrubs in place will create effective windbreaks. More temporary types of windbreaks are solid board fences, snow fences, tarp curtains, hay bales, crate walls, and sediment walls.

- Tillage — Deep plowing will roughen the soil surface to bring up to the surface cohesive clods of soil, which in turn rest on top of dusts, protecting them from wind and water erosion. This practice is commonly practiced in arid regions where establishing vegetation may take time.

- Chemical Soil Treatment (palliatives) — These are temporary controls that are applied to soil surfaces in the form of spray-on adhesives, such as anionic asphalt emulsion, latex emulsion, resin-water emulsions, or calcium chloride. The palliative is the chemical used. These should be used with caution as they may create pollution if not used correctly.

Dust controls can be used on any site where dust may be generated and where the dust may cause onsite and offsite damage. Dust controls are especially critical where reduced rainfall levels expose soil particles for transport by air and runoff. Dust control should be used in conjunction with other sedimentation controls such as traps.

Exposure of soil should be limited to control dust during land disturbance and at demolition area. Work that causes soil disturbance or involves demolition should be done in phases and accompanied by temporary stabilization measures, when possible. These precautions will minimize the amount of soil that is disturbed at any one time and help control dust.

Oil should not be used to control dust because of its high potential for polluting storm water discharges.

Irrigation will be most effective if site drainage systems are checked to ensure that the right amount of water is used. Too much water can cause runoff problems.

Chemical treatment is only effective on mineral soils, as opposed to muck soils, because the chemicals bond better to mineral soils. Vehicular traffic should be routed around chemically treated areas to avoid tracking of the chemicals. Certain chemicals may be inappropriate for some types of soils or application areas. Local governments usually have information about restrictions on the types of palliatives that may be used. Special consideration must be given to preserving groundwater quality whenever chemicals are applied to the land.

Since most of these techniques are temporary controls, sites should be inspected often and materials should be reapplied when needed. The frequency for these inspections depends on site-specific conditions, weather conditions, and the types of technique used.

Advantages of Dust Control (Land Disturbance and Demolition Areas)	Disadvantages of Dust Control (Land Disturbance and Demolition Areas)
• Can help prevent wind-and-water based erosion of disturbed areas and will reduce respiratory problems in employees • Some types can be implemented quickly at low cost and effort (except wind breaks) • Helps preserve the aesthetics of the site and screens certain activities from view (wind breaks) • Vegetative wind breaks are permanent and an excellent alternative to chemical use	• Some types are temporary and must be reapplied or replenished regularly • Some types are expensive (irrigation and chemical treatment) and may be ineffective under certain conditions • May result in health/environmental hazards, if over-application of the chemicals leaves large amounts exposed to wind and rain erosion or groundwater contamination • May create excess runoff that the site was not designed to control (irrigation) • May cause increased offsite tracking of mud (irrigation) • Is not as effective as chemical treatment or mulching and seeding; requires land space that may not be available at all locations (wind breaks)

EC-2 TEMPORARY SEEDING

Temporary seeding means growing a short-term vegetative cover (plants) on disturbed site areas that may be in danger of erosion. The purpose of temporary seeding is to reduce erosion and sedimentation by stabilizing disturbed areas that will not be stabilized for long periods of time or where permanent plant growth is not necessary or appropriate. This practice uses fast-growing grasses whose root systems hold down the soils so that they are less apt to be carried offsite by storm water runoff or wind. Temporary seeding also reduces the problems associated with mud and dust from bare soils surfaces during construction.

Temporary seeding should be performed on areas which have been disturbed by construction and which are likely to be redisturbed, but not for several weeks or more. Typical areas might include denuded areas, soil stockpiles, dikes, dams, sides of sediment basins and temporary road banks. Temporary seeding should take place as soon as practicable after the last land disturbing activity in an area. Temporary seeding may not be an effective practice in arid and semi-arid regions where the climate prevents fast plant growth, particularly during the dry seasons. In those areas, mulching or chemical stabilization may be better for the short-term (Refer to Mulching Best Management Practices (BMPs) SECP-7 and Chemical Stabilization BMP EC-3).

Proper seed bed preparation and the use of high-quality seed are needed to grow plants for effective erosion control. Soil that has been compacted by heavy traffic or machinery may need to be loosened. Successful growth usually requires that the soil be tilled before the seed is applied. Topsoiling is not necessary for temporary seeding; however, it may improve the chances of establishing temporary vegetation in an area. Seed bed preparation may also require applying fertilizer/lime to the soil to make conditions more suitable for plant growth. Proper fertilizer, seeding mixtures, and seeding rates vary depending on the location of the site, soil types, slopes, and season. Local suppliers, State and local regulatory agencies, and the United States Department of Agriculture (USDA) Soil Conservation Service will supply information on the best seed mixes and soil conditioning methods.

Seeded areas should be covered with mulch to provide protection from the weather. Seeding on slopes of 2:1 or more, in adverse soil conditions, during excessively hot or dry weather, or where heavy rain is expected should be followed by spreading mulch (Refer Mulching BMP SECP-7).

Frequent inspections are necessary to check that conditions for growth are good. If the plants do not grow quickly or thick enough to prevent erosion, the area should be reseeded as soon as possible. Seeded areas should be kept adequately moist. If normal rainfall is insufficient the seeded area should be watered. Watering rates should be watched so that over-irrigation (which can cause erosion itself) does not occur.

Advantages of Temporary Seeding	Disadvantages of Temporary Seeding
• Generally inexpensive and easy to do	• Depends heavily on the season and rainfall rate for success
• Establishes plant cover fast when conditions are good	• May require extensive fertilizing of plants grown on some soils, which can cause problems with local water quality
• Stabilizes soils well, is aesthetic, and can provide sedimentation controls for other site areas	• Requires protection from heavy use, once seeded
• May help reduce costs of maintenance on other erosion controls (sediment basins may need to be cleaned out less often)	• May produce vegetation that requires irrigation and maintenance

EC-3 CHEMICAL STABILIZATION

Chemical stabilization practices, often referred to as a chemical mulch, soil binder, or soil palliative (Refer to Dust Control Best Management Practice (BMP) EC-1), are temporary erosion control practices. Materials made of vinyl, asphalt, or rubber are sprayed onto the surface of the soil to hold in place and protect against erosion from storm water runoff and wind. Many of the products used for chemical stabilization are human-made, and many different products are on the market.

Chemical stabilization can be used as an alternative in areas where temporary seeding practices cannot be used because of the season or climate. It can provide immediate, effective, and inexpensive erosion control anywhere erosion is occurring on a site.

The application rates and procedures recommended by the manufacturer of a chemical stabilization product should be followed as closely as possible to prevent the products from forming ponds and from creating large areas where moisture cannot get through.

Advantages of Chemical Stabilization	**Disadvantages of Chemical Stabilization**
• Easily applied to the surface of the soil • Effective in stabilizing areas where plants will not grow • Provides immediate protection to soils that are in danger of erosion	• Can create impervious surfaces (where water cannot get through), which may in turn increase the amount and speed of storm water runoff • May caused harmful effects on water quality if not used correctly • Usually more expensive than vegetative cover

EC-4 INTERCEPTOR DIKES AND SWALES

Interceptor dikes (ridges of compacted soil) and swales (excavated depression) are used to keep up-slope runoff from crossing areas where there is a high risk of erosion. They reduce the amount and speed of flow and then guide it to a stabilized outfall (point of discharge) or sediment trapping area. (Refer to Outlet Protection Best Management Practice (BMP) EC-12; Level Spreaders BMP SE-10; Vegetated Filter Strips BMP EC-16; Sediment Traps BMP EC-10; and Temporary Sediment Basins BMP EC-11). Interceptor dikes and swales divert runoff using a combination of earth dike and vegetated swale (Refer to Grassed Swales BMP SECP-10). Runoff is channeled away from locations where there is a high risk of erosion by placing a diversion dike or swale at the top of a sloping disturbed area. Dikes and swales also collect overland flow, changing it into concentrated flows (flows that are combined). Interceptor dikes and swales can be either temporary or permanent storm water control structures.

Interceptor dikes and swales are generally built around the perimeter of a construction site before any major soil disturbing activity takes place. Temporary dikes or swales may also be used to protect existing buildings; areas, such as stockpiles; or other small areas that have not yet been fully stabilized. When constructed along the up-slope perimeter of a disturbed or high-risk area (though not necessarily all the way around it), dikes or swales prevent runoff from uphill areas from crossing the unprotected slope. Temporary dikes or swales constructed on the down slope side of the disturbed or high-risk area will prevent runoff that contains sediment from leaving the site before sediment is removed. For short slopes, a dike or swale at the top of the slope reduces the amount of runoff reaching the disturbed area. For longer slopes, several dikes or swales are placed across the slope at intervals. This practice reduces the amount of runoff that accumulates on the face of the slope and carries the runoff safely down the slope. In all cases, runoff is guided to a sediment trapping area or a stabilized outfall before release.

Temporary dikes and swales are used in areas of overland flow; if they remain in place longer than 15 days, they should be stabilized. Runoff channeled by a dike or swale should be directed to an adequate sediment trapping area or stabilized outfall. Care should be taken to provide enough slope for drainage but not too much slope to cause erosion due to high runoff flow speed. Temporary interceptor dikes and swales may remain in place as long as 12 to 18 months (with proper stabilization) or be rebuilt at the end of each day's activities. Dikes or swales should remain in place until the area they were built to protect is permanently stabilized. Interceptor dikes and swales can be permanent controls. However, permanent controls should be designed to handle

runoff after construction is complete; should be permanently stabilized; and should be inspected and maintained on a regular basis. Temporary and permanent control measures should be inspected once each week on a regular schedule and after every storm. Repairs necessary to the dike and flow channel should be made promptly.

Advantages of Interceptor Dikes and Swales	**Disadvantages of Interceptor Dikes and Swales**
• Are simple and effective for channeling runoff away from areas subject to erosion • Can handle flows from large drainage areas • Are inexpensive because they use materials and equipment normally found onsite	• If constructed improperly, can cause erosion and sediment transport since flows are concentrated • May cause problems to vegetation growth if water flow is too fast • Require additional maintenance, inspections, and repairs

EC-5 FILTER FENCE

A filter fence, also called "silt fence" is a temporary measure for sedimentation control. It usually consists of posts with filter fabric stretched across the posts and sometimes with a wire support fence. The lower edge of the fence is vertically trenched and covered by backfill. A silt fence is used in small drainage areas to detain sediment. These fences are most effective where there is overland flow or in minor swales or drainageways. They prevent sediment from entering receiving waters. Silt fences are also used to catch wind blown sand. Aside from the traditional wooden post and filter fabric method, there are several variations of silt fence installation including silt fence which can be purchased with pockets pre-sewn to accept use of steel fence posts.

A silt fence should be installed prior to major soil disturbance in the drainage area. Such a structure is only appropriate for drainage areas of 1.0 acre or less with velocities of 0.5 cfs (cubic feet per second) or less. The fence should be placed across the bottom of a slope or minor drainageway along a line of uniform elevation (perpendicular to the direction of flow) and can be used at the outer boundary of the work area. The fence does not have to surround the work area completely. In addition, a silt fence is effective where sheet and rill (small watercourse that has steep sides and is usually on a few inches deep) erosion may be a problem. Silt fences should not be constructed in streams or swales. Install silt fences in accordance with the manufacturer's recommendations.

A silt fence is not appropriate for a large area or where the flow rate is greater than 0.5 cfs. This type of fence can be more effective than a straw bale barrier if properly installed and maintained and may be used in combination with other erosion/sediment practices.

The effective life span for a silt fence is approximately six (6) months. During this period, the fence requires frequent inspection and prompt maintenance to maintain its effectiveness. Inspect the fence after each rainfall. Check for areas where runoff eroded a channel beneath the fence, or where the fence was caused to sag or collapse by runoff flowing over the top. Remove and properly dispose of sediment when it is one-third to one-half the height of the fence or after each storm.

Advantages of Filter Fence	Disadvantages of Filter Fence
• Remove sediments and prevents downstream damage from sediment deposits	• May result in failure from improper choice of pore size in the filter fabric or improper installation
• Reduces the speed of runoff flow	• Should not be used in streams
• Minimal clearing and grubbing required for installation	• Only appropriate for small drainage areas with overland flow
• Inexpensive	• Frequent inspection and maintenance is necessary to ensure effectiveness

EC-6 STRAW BALE BARRIER

Straw bales can be used as temporary sediment barrier. They are placed end to end in a shallow excavated trench (with no gaps in between) and staked into place. If properly installed, they can detain sediment and reduce flow velocity from small drainage areas. A straw bale barrier prevents sediment from leaving the site by trapping the sediment in the barrier while allowing the runoff to pass through. It can also be used to decrease the velocity of sheetflow or channel flows of low-to-moderate levels.

A straw bale barrier should be installed prior to major soil disturbance in the drainage area. This type of barrier is placed perpendicular to the flow, across the bottom of a slope or minor drainageway where there is sheetflow. It can be used at the perimeter of the work area, although it does not have to surround it completely. It can also be very effective when used in combination with other erosion and sediment control practices. A straw bale barrier may be used where the length of slope behind the barrier is less than 100 feet and where the slope is less than 2:1.

The success of a straw bale barrier depends on proper installation. The bales must be firmly staked into the entrenchment ditch and the ditch must be properly backfilled. To function effectively, the bales must be placed end to end and there can be no gaps between the bales.

Straw bale barriers are useful for approximately 3 months. They must be inspected and repaired immediately after each rainfall or daily if there is prolonged rainfall. Damaged straw bales require immediate replacement. After each storm, or on a regular basis, trapped sediments must be removed and disposed of properly.

Advantages of a Straw Bale Barrier	Disadvantages of a Straw Bale Barrier
• Can prevent downstream damage from sediment deposits if properly installed, used, and maintained • Can be an inexpensive way to reduce or prevent erosion	• May not be used in streams or large swales • Poses a risk of washouts if the barrier is installed improperly or a storm is severe • Short life span and a high inspection and maintenance requirement • Appropriate for only small drainage areas • Easily subject to misuse and can contribute to sediment problems

EC-7 BRUSH BARRIER

A brush barrier is a temporary sediment barrier constructed from materials resulting from onsite clearing and grubbing. It is usually constructed at the bottom perimeter of the disturbed area. Filter fabric is sometimes used as an anchor over the barrier to increase its filtering efficiency. Brush barriers are used to trap and retain small amounts of sediment by intercepting the flow from small areas of soil disturbance.

A brush barrier should only be used to trap sediment from runoff which is from a small drainage area. The slope which the brush barrier is placed across should be very gentle. Do not place a brush barrier in a swale or any other channel. Brush barriers should be constructed below areas subject to erosion.

The construction of a brush barrier should be started as soon as clearing and grubbing has produced enough material to make the structure. Wood chips should not be included in the material used for the barrier because of the possibility of leaching. When the site has been stabilized and any excess sediment has been disposed of properly, the filter fabric can be removed. Over time, natural vegetation will establish itself within the barrier, and the barrier itself will decompose.

It should not be necessary to maintain the brush barrier unless there is a very large amount of sediment being deposited. If used, the filter fabric anchor should be checked for tears and the damaged sections replaced promptly. The barrier should be inspected after each rainfall and checked for areas breached by concentrated flow. If necessary, repairs should be made promptly and excess sediment removed and disposed of properly.

Advantages of a Brush Barrier	Disadvantages of a Brush Barrier
• Can help prevent downstream damage from sediment deposits	• Does not replace a sediment trap or basin
• Constructed of cleared onsite materials and, thus, is inexpensive	• Appropriate for only small drainage areas
• Usually requires little maintenance, unless there are very heavy sediment deposits	• Very limited sediment retention

EC-8 GRAVEL OR STONE FILTER BERM

A gravel or stone filter berm is a temporary ridge constructed of loose gravel, stone, or crushed rock. It slows and filters flow, diverting it from an exposed traffic area. Diversions constructed of compacted soil may be used where there will be little or no construction traffic. They are also used for directing runoff to a stabilized outlet.

This method is appropriate where construction will accommodate vehicular traffic. Berms are meant for use in areas with shallow slopes. They may also be used at traffic areas within the construction site.

Berm material should be well graded gravel or crushed rock. The spacing of the berms will depend on the steepness of the slope: berms should be *placed* ***closer together as the slope increases.*** The diversion should be inspected daily, after each rainfall, or if breached by construction or other vehicles. All needed repairs should be performed immediately. Accumulated sediment should be removed and properly disposed of and the filter material replaced, as necessary.

Advantages of a Gravel or Stone Filter Berm	**Disadvantages of a Gravel or Stone Filter Berm**
• Very efficient method of sediment control	• More expensive than methods that use onsite materials • Very limited life span • Difficult to maintain because clogging from mud and soil

EC-9 STORM DRAIN INLET PROTECTION

Storm drain inlet protection is a filtering measure placed around any inlet or drain to trap sediment. This mechanism prevents the sediment from entering inlet structures. Additionally, it serves to prevent the silting-in (clogging) of inlets, storm drainage systems, or receiving channels. Inlet protection may be composite of gravel and stone with a wire mesh filter, block and gravel, filter fabric, or sod.

This type of protection is appropriate for small drainage areas where storm drain inlets will be ready for use before final stabilization. Storm drain inlet protection is also used where a permanent storm drain structure is being constructed onsite. Straw bales are not recommended for this purpose. Filter fabric is used for inlet protection when storm water flows are relatively small with low velocities. This practice cannot be used where inlets are paved because the filter fabric should be staked. Block and gravel filters can be used where velocities are higher. Gravel and mesh filters can be used where flows are higher and subject to disturbance by site traffic. Sod used for inlet filters is generally used where sediments in the storm water runoff are low.

Storm drain inlet protection is not meant for use in drainage areas exceeding one (1) acre or for large concentrated storm water flows. Installation of this measure should take place before any soil disturbance in the drainage area. The type of material used will depend on site conditions and the size of the drainage area. Inlet protection should be used in combination with other measures, such as small impoundments or sediment traps, to provide more effective sediment removal. ***Inlet protection structures should be inspected regularly, especially after a rainstorm.*** Repairs and silt removal should be performed as necessary. Storm drain inlet protection structures should be removed only after the disturbed areas are completely stabilized.

Advantages of Storm Drainage Inlet Protection	**Disadvantages of Storm Drain Inlet Protection**
• Prevents clogging of existing storm drainage systems and the siltation of receiving waters • Reduces the amount of sediment leaving the site	• May be difficult to remove collected sediment • May cause erosion elsewhere if clogging occurs • Practical only for low sediment, low volume flows

EC-10 SEDIMENT TRAP

A sediment trap is formed by excavating a pond or by placing an earthen embankment across a low area or drainage swale (vegetated depressions used to transport, filter, and remove sediments). (Refer to Grassed Swales Best Management Practice (BMP) SECP-10). An outlet or spillway is constructed using large stones or aggregate to slow the release of runoff. The trap retains the runoff long enough to allow most of the silt to settle out.

A temporary sediment trap may be used in conjunction with other temporary measures, such as gravel construction entrances, vehicle wash areas, slope drains, diversion dikes and swales, or diversion channels. This device is appropriate for sites with short time schedules.

Sediment traps are suitable for small drainage areas, usually no more than ten (10) acres, that have no unusual drainage features. The trap should be large enough to allow the sediments to settle and should have a capacity to store the collected sediment until it is removed. The volume of storage required depends upon the amount and intensity of expected rainfall and on estimated quantities of sediment in the storm water runoff.

A sediment trap is effective for approximately 18 months. During this period, the trap should be readily accessible for periodic maintenance and sediment removal. Traps should be inspected after each rainfall and cleaned when no more than half the design volume has been filled with collected sediment. The trap should remain in operation and be properly maintained until the site area is permanently stabilized by vegetation/when permanent structures are in place.

Advantages of a Sediment Trap	Disadvantages of a Sediment Trap
• Protects downstream areas from clogging or damage due to sediment deposits	• Suitable only for a limited area
• Inexpensive and simple to install	• Effective only if properly maintained
• Can simplify the design process by trapping sediment at specific spots onsite	• Will not remove very fine silts and clays
	• Short life span

EC-11 TEMPORARY SEDIMENT BASIN

A temporary sediment basin is a settling pond with a controlled storm water release structure used to collect and store sediment produced by construction activities. A sediment basin can be constructed by excavation or by placing an earthen embankment across a low area or drainage swale (vegetated depressions used to transport, filter, and remove sediments). (Refer to Grassed Swales Best Management Practice (BMP) SECP-10). Sediment basins can be designed to maintain a permanent pool or to drain completely dry. The basin detains sediment-laden runoff from larger drainage areas long enough to allow most of the sediment to settle out.

The pond has a gravel outlet or spillway to slow the release of runoff and provide some sediment filtration. By removing sediment, the basin helps prevent clogging of offsite conveyance systems and sediment-loading of receiving waterways which helps prevent destruction of waterway habitats.

A temporary sediment basin should be installed before clearing and grading is undertaken. It should not be built on an embankment in an active stream. The creation of a dam in such a site may result in the destruction of aquatic habitats. Dam failure can also result in flooding. A temporary sediment basin should be located only where there is sufficient space and appropriate topography. The basin should be made large enough to handle the maximum expected amount of site drainage. Fencing around the basin may be necessary for safety or vandalism reasons.

A temporary sediment basin used in combination with other control measures, such as seeding or mulching, is especially effective for removing sediments.

Temporary sediment basins are usually designed for disturbed areas larger than five acres. The pond should be large enough to hold runoff long enough for sediment to settle. Sufficient space should be allowed for collected sediments. The useful life of a temporary sediment basin is about 12 to 18 months.

Sediment trapping efficiency is improved by providing the maximum surface area possible. Because finer silts may not settle out completely, additional erosion control measures should be used to minimize release of fine silt. ***Runoff should enter the basin as far from the outlet as possible to provide maximum retention time.***

Sediment basins should be readily accessible for maintenance and sediment removal. They should be inspected after each rainfall and be cleaned out when about half the volume has been filled with sediment. The sediment basin should remain in operation and be properly maintained until the site area is permanently stabilized by vegetation/when permanent structures are in place. The embankment forming the sedimentation pool should be well compacted and stabilized with vegetation. If the pond is located near a residential area, it is recommended for safety reasons that a sign be posted and that the area be secured by a fence. A well-built temporary sediment basin that is large enough to handle the post-construction runoff volume may later be converted to use as a permanent storm water management structure.

Advantages of a Temporary Sediment Basin	**Disadvantages of a Temporary Sediment Basin**
• Protects downstream areas from clogging or damage due to sediment deposits generated during construction activities • Can trap smaller sediment particles than sediment traps can because of the longer detention time	• Generally suitable for small areas • Requires regular maintenance and cleaning • Will not remove very fine silts and clays unless used in conjunction with other measures • More expensive way to remove sediment than several other methods • Requires careful adherence to safety practices since ponds are attractive to children

EC-12 OUTLET PROTECTION

Outlet protection reduces the speed of concentrated storm water flows and reduces erosion or scouring at storm water outlets and paved channel sections. Outlet protection also lowers the potential for downstream erosion. This type of protection can be achieved through a variety of techniques, including stone or riprap, concrete aprons, paved sections and settling basins installed below the storm drain outlet.

Outlet protection should be installed at all pipe, interceptor dike, swale, or channel section outlets where the velocity of flow may cause erosion at the pipe outlet and in the receiving channel. Outlet protection should also be used at outlets where the velocity of flow at the design capacity may result in plunge pools (small permanent pools located at the inlet to or the outfall from applied Best Management Practices [BMPs]). Outlet protection should be installed early during construction activities, but may be added at any time, as necessary.

The exit velocity of the runoff as it leaves the outlet protection structure should be reduced to levels that minimize erosion. Outlet protection should be inspected on a regular schedule to look for erosion and repairs should be made promptly.

Advantages of Outlet Protection	Disadvantages of Outlet Protection
• Provides, with riprap-line apron (the most common outlet protection), a relatively low cost method that can be installed easily on most sites • Removes sediment in addition to reducing flow speed • Can be used at most outlets where the flow speed is high • Inexpensive but effective measure • Requires less maintenance than many other measures	• May be unsightly • May cause problems in removing sediment (without removing and replacing the outlet protection structure itself) • May require frequent maintenance for rock outlets with high velocity flows

EC-13 CHECK DAMS

A check dam is a small, temporary or permanent dam constructed across a drainage ditch, swale, or channel to lower the speed of concentrated flows. Reduced runoff speed reduces erosion and gully formation in the channel which allows sediments and other pollutants to settle out.

A check dam should be installed in steeply sloped swales, or in swales where adequate vegetation cannot be established. A check dam may be built from logs, stone, or pea gravel-filled sandbags.

Check dams should be used only in small open channels that drain ten (10) acres or less. The dams should not be placed in streams (unless approved by appropriate state authorities).

The center section of the check dam should be lower than the edges. Dams should be spaced so that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

After each significant rainfall, check dams should be inspected for sediment and debris accumulation. Sediment should be removed where it reaches one half the original dam height. Check for erosion at edges and repair promptly as required. After construction is complete, all stone and riprap should be removed if vegetative erosion controls will be used as a permanent erosion control measure. It will be important to know the expected erosion rates and runoff flow rate for the swale (vegetated depressions used to transport, filter, and remove sediments) (refer to Grassed Swales Best Management Practice (BMP) SECP-10) in which this measure is to be installed. A licensed professional engineer should design this type of BMP.

Advantages of Check Dams	Disadvantages of Check Dams
• Are inexpensive and easy to install • May be used permanently if designed properly • Allow a high proportion of sediment in the runoff to settle out • Reduce velocity and provide aeration of the water • May be used where it is not possible to divert the flow or otherwise stabilize the channel	• May kill grass linings in channels if the water level remains high after it rains or if there is significant sedimentation • Useful only for drainage areas of 10 acres or less

EC-14 SURFACE ROUGHENING

Surface roughening is a temporary erosion control practice. The soil surface is roughened by the creation of horizontal grooves, depressions, or steps that run parallel to the contour of the land. Slopes that are not fine-graded and that are left in a roughened condition can also control erosion. Surface roughening reduces the speed of runoff, increases infiltration, and traps sediment. Surface roughening also helps establish vegetative cover by reducing runoff velocity and giving seed an opportunity to take hold and grow.

Surface roughening is appropriate for all slopes. To slow erosion, roughening should be done as soon as possible after the vegetation has been removed from the slope. Roughening can be used with both seeding and planting and temporary mulching to stabilize an area. For steeper slopes and slopes that will be left roughened for longer periods of time, a combination of surface roughening and vegetation is appropriate.

Different methods can be used to roughen the soil surface on slopes. They include stair-step grading, grooving (using disks, spring harrows, or teeth on a front-end loader), and tracking (driving a crawler tractor up and down a slope, leaving the cleat imprints parallel to the slope contour). The selection of an appropriate method depends on the grade of the slope, mowing requirements after vegetative cover is established, whether the slope was formed by cutting or filling, and types of equipment available.

Cut slopes with a gradient steeper than 3:1 but less than 2:1 should be stair-step graded or groove cut. Stair-step grading works well with soils containing large amounts of small rock. Each step catches material discarded from above and provides a level site where vegetation can grow. Stairs should be wide enough to work with standard earth moving equipment. Grooving can be done by any implement that can be safely operated on the slope, including those described above. Grooves should not be less than 3 inches deep nor more than 15 inches apart. Fill slopes with a gradient steeper than 3:1 but less than 2:1 should be compacted every 9 inches of depth. The face of the slope should consist of loose, uncompacted fill 4 to 6 inches deep that can be left rough or can be grooved as described above, if necessary.

Any cut or filled slope that will be mowed should have a gradient less than 3:1. Such a slope can be roughened with shallow grooves parallel to the slope contour by using normal tilling. Grooves

should be close together (less than 10 inches) and not less than 1 inch deep. Any gradient with a slope greater than 2:1 should be stair-stepped.

It is important to avoid excessive compacting of the soil surface, especially when tracking, because soil compaction inhibits vegetation growth and causes higher runoff speed. It is best to limit roughening with tracked machinery to sandy soils that do not compact easily and to avoid tracking on clay soils. Surface roughened areas should be seeded as quickly as possible. Regular inspections should be made of all surface roughened areas, especially after storms. If rills, (small watercourses that have steep sides and are usually only a few inches deep) appear, they should be filled, graded again, and reseeded immediately. Proper dust control procedures should be followed when surface roughening.

Advantages of Surface Roughening	Disadvantages of Surface Roughening
• Provides a degree of instant erosion protection for bare soil while vegetative cover is being established • Inexpensive and simple for short-term erosion control	• Limited effectiveness in anything more than a gentle rain • Only temporary; if roughening or vegetative cover is washed away in a heavy storm or the vegetation does not take hold, the surface will have to be re-roughened and new seed laid

EC-15 GRADIENT TERRACES

Gradient terraces are earth embankments or ridge-and-channels constructed with suitable spacing and with an appropriate grade. They reduce erosion damage by capturing surface runoff and directing it to a stable outlet at a speed that minimizes erosion.

Gradient terraces are usually limited to use on land that has no vegetation with a water erosion problem, or where it is expected that water erosion will be a problem. Gradient terraces should not be constructed on slopes with sandy or rocky soils. They will be effective only where suitable runoff outlets are or will be made available.

Gradient terraces should be designed and installed according to a plan determined by an engineering survey and layout. It is important that gradient terraces are designed with adequate outlets, such as a grassed waterway, vegetated area, or tile outlet. Every outlet should direct the runoff from the terrace system to a point where the outflow will not cause erosion or other damage. Vegetative cover should be used in the outlet where possible. The design elevation of the water surface of the terrace should not be lower than the design elevation of the water surface in the outlet at their junction, when both are operating at design flow. ***Terraces should be inspected regularly at least once a year and after major storms.*** Proper dust control procedures should be followed while constructing these features (Refer to Dust Control Best Management Practice (BMP) EC-1).

Advantages of Gradient Terraces	Disadvantages of Gradient Terraces
• Reduce runoff speed and increase the distance of overland runoff flow	• May significantly increase cut and fill cost and cause sloughing if excessive water infiltrates the soil
• Hold moisture better than do smooth slopes and minimize sediment loading of surface runoff	• Not practical for sandy, steep, or shallow soils

EC-16 VEGETATED FILTER STRIPS

Vegetated filter strips are gently sloping areas of natural vegetation or are graded and artificially planted areas used to provide infiltration, remove sediments and other pollutants, and reduce the flow and velocity of the storm water moving across the terrain. Vegetated filter strips provide permanent storm water control measures on a site.

Vegetative filter strips are suited for areas where the soils are well drained or moderately well drained and where the bedrock and the water table are well below the surface. Vegetated filter strips will not function well on steep slopes, in hilly areas, or in highly paved areas because of the high velocity of runoff. Sites with slopes of 15 percent or more may not be suitable for filtering storm water flows. However, they should still be vegetated. This practice can be put into place at any time, provided that climatic conditions allow for planting.

A filter strip must be approximately 20 feet wide, minimum, to function well. The length of the strip should be approximately 50 to 75 feet. Where slopes become steeper, the length of the strip must be increased. Forested strips are always preferred to vegetated strips, and existing vegetation is preferred to planted vegetation. In planning for vegetated strips, consider climatic conditions, since vegetation may not take hold in especially dry/cold regions.

Regular inspections are necessary to ensure the proper functioning of the filter strips. Removing sediments and replanting may be necessary on a regular basis. The entire area should be examined for damage due to equipment and vehicles. Vegetation should be dense. The portions of the strip where erosion may have created ponding of runoff should be inspected and this situation can be eliminated by grading.

Advantages of Vegetated Filter Strips	Disadvantages of Vegetated Filter Strips
• Provide low to moderate treatment of pollutants in storm water while providing a natural look to a site • Can provide habitat for wildlife • Can screen noise and views if trees or high shrubs are planted on the filter strips • Easily constructed and implemented • Inexpensive	• Not effective for high velocity flows (large paved areas or steep slopes) • Require significant land space • May have a short useful life due to clogging by sediments and oil and grease

Appendix D
Analytical Sampling Results

nexAir LLC, Millington, Tennessee
Historical Storm Water Sampling Data

Date of Sampling	Total Recoverable Aluminum 0.75 mg/L	Total Recoverable Copper 0.018 mg/L	Total Recoverable Magnesium 0.064 mg/L	Total Recoverable Iron 5.0 mg/L	Nitrate plus Nitrite Nitrogen 0.68 mg/L	Ammonia 4.0 mg/L	Total Suspended Solids[1]
2008	<0.100	<0.005	**0.371**	0.34	0.1444	NA	15
2009	0.164	0.017	**3.78**	0.192	**5.66**	NA	6
2010	<0.100	0.014	**9.54**	<0.100	0.68	NA	<2
2011	NA	NA	NA	NA	NA	NA	NA
2012	NA	NA	NA	NA	NA	NA	NA
2013	NA	NA	NA	NA	NA	NA	NA
2014	NA	NA	NA	NA	NA	NA	NA
2015	**0.954**	0.0075	**1.09**	1.82	0.24	0.29	NA

Notes:
1. Not a required parameter
2. mg/L - milligrams per liter
3. NA - Not Analyzed
4. Bold indicates exceedence of TMSP Benchmark

Appendix E

Storm Water Inspection/Compliance Forms

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

DIVISION OF WATER RESOURCES

William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102
(615) 532-0625

ANNUAL STORMWATER MONITORING REPORT

for Stormwater Discharges Associated with Industrial Activity under the

TENNESSEE MULTI-SECTOR GENERAL PERMIT (TMSP)

Facility Name:		TMSP Number:	
Contact Person:		Phone Number:	
This report is submitted for the following calendar year (e.g. 2015):		Outfall Number:	
List all TMSP sectors which apply to discharge from this outfall:		Sample Date:	
Low Concentration Waiver (Note 3): list all parameters for which the facility is certifying that there has not been a significant change in industrial activity or the pollution prevention measures in the area of the facility that drains to the outfall for which sampling was waived:			

DIRECTIONS:

In the spaces below, provide the results of stormwater monitoring for the designated outfall. For each outfall, one Annual Stormwater Monitoring Report must be submitted. The parameters for which monitoring must be conducted depend on which industry sector(s) of the TMSP applies to the discharge. Look up your sector(s) in the TMSP and analyze for the parameters that apply. If parameter is not listed below, submit additional sheets. All samples should be grab.

Parameter	Cut-off Conc. (mg/L)	Annual Sample Result (mg/L)	Parameter (continued)	Cut-off Conc. (mg/L)	Annual Sample Result (mg/L)
Aluminum, Total	0.75		Magnesium, Total	0.0636	
Ammonia	4.0		Mercury, Total	0.0024	
Arsenic, Total	0.1685		Nickel, Total	0.875	
BOD, 5-Day	30		Nitrate + Nitrite Nitrogen	0.68	
Cadmium, Total	0.0159		Oil and Grease	15	
COD	120		pH	5.0-9.0	
Copper, Total	0.018		Phosphorus, Total (as P)	2.0	
Cyanide, Total	0.064		Selenium, Total	0.2385	
Fluoride	1.8		Silver, Total	0.032	
Iron, Total	5.0		Total Suspended Solids	150	
Lead, Total	0.15		Zinc, Total	0.395	

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ANNUAL STORMWATER MONITORING REPORT

for Stormwater Discharges Associated with Industrial Activity under the

TENNESSEE MULTI-SECTOR GENERAL PERMIT (TMSP)

CERTIFICATION AND SIGNATURE

(Make all entries in ink, not with a pencil. This report must be signed by a responsible corporate officer for a corporation, a general partner for a partnership, the proprietor for a sole proprietorship, or a principal executive officer or ranking elected official for a public agency.)

I certify under penalty of law that this document and all of its attachments were prepared under my direction or my supervision in accordance with a system designed to assure qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Printed Name	Official Title	Signature	Date

Tennessee Multi-Sector General Permit (TMSP)
Annual Stormwater Monitoring Report – Instructions

1. The purpose of this form is to report stormwater (SW) monitoring results under the TMSP. **Only 1 sample per calendar year is required** (except Sectors J and H). **For each outfall, one Annual Stormwater Monitoring Report form must be submitted.** Grab samples should be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed one hour) of when the runoff or snowmelt begins discharging. A separate form must be submitted for each outfall. If more than 1 sample is collected at any outfall, submit the average results of all monitoring data (for calculating average, use ½ of a detection level, if parameter was not detected). New facilities must conduct sampling in the year during which permit coverage was obtained and during each following year. The form(s) shall be submitted 30 days after the sampling results are obtained, but no later than the March 31st of the following calendar year.
2. If the results of annual SW runoff monitoring demonstrates that the facility has exceeded the cut-off concentration(s), the permittee must inform the division's local Environmental Field Office (EFO) in writing within 30 days from the time SW monitoring results were received, describing the likely cause of the exceedance(s). Furthermore, within 60 days from the time SW monitoring results were received, the facility must review its stormwater pollution prevention plan (SWPPP), make any modifications or additions to the plan which would assist in reducing runoff concentrations to less than the monitoring cut-off concentrations for that parameter, and submit to the local EFO a summary of the proposed SWPPP modifications (including a timetable for implementation).
3. Low Concentration Waiver – When the average concentration for a pollutant calculated from monitoring data collected from the first 4 calendar years of monitoring is less than the cut-off concentration, a facility may waive monitoring requirements in the last annual monitoring period. This form should be used for certification of low concentration waiver provision.

Complete, sign and date this form before it is submitted. Keep a copy of the completed form for your records. Submit the original completed and signed form to the appropriate Environmental Field Office using the addresses below. You can also send a scanned copy to Water.Permits@tn.gov

EFO	Street Address	City	Zip	Telephone
Chattanooga	1301 Riverfront Parkway, Suite #206	Chattanooga	37402	(423) 634-5745
Columbia	1421 Hampshire Pike	Columbia	38401	(931) 380-3371
Cookeville	1221 South Willow Ave.	Cookeville	38506	(931) 432-4015
Jackson	1625 Hollywood Drive	Jackson	38305	(731) 512-1300
Johnson City	2305 Silverdale Road	Johnson City	37601	(423) 854-5400
Knoxville	3711 Middlebrook Pike	Knoxville	37921	(865) 594-6035
Memphis	8383 Wolf Lake Drive	Bartlett	38133	(901) 371-3000
Nashville	711 RS Gass Boulevard	Nashville	37216	(615) 687-7000

Mining and quarrying facilities only (Sectors J and H) should submit one signed copy of Annual Stormwater Monitoring Report to the division's Mining Section at the following address:

Tennessee Division of Water Resources
Mining Section
3711 Middlebrook Pike
Knoxville, TN 37921

MONTHLY FACILITY-WIDE ENVIRONMENTAL INSPECTION

	Directions: Please answer all questions and write comments for any observed deficiencies and corrective action.	NA	Yes	No	
No.	Question				
	SOLID WASTE AND SCRAP METAL STORAGE AREAS				
1	Is the area around Solid Waste Dumpsters/Scrap Metal Bins free from stains or loose materials/debris?				
2	Is the Solid Waste within the Dumpsters properly contained (i.e., not overflowing, bin door secured)?				
	OUTFALL AREAS				
1	Are stored and spilled materials prevented from reaching inlets, pipes, or ditches?				
2	Are controls to minimize materials being carried by runoff to drainage ways (silt fences, screens over inlets and culverts, etc.), in good shape and operating properly?				
3	If outfalls leaving property are flowing during dry weather (check NA if none are flowing), is flow due to permitted non-storm-water discharge?				
4	Are inlets, pipes, ditches, and ponds (check NA if none) free of excess sediment, debris, raw materials (for example, asphalt, oils), oil sheen, and other possible contaminants?				
	LOADING / UNLOADING AREAS				
1	Is appropriate lighting provided for nighttime operations?				
2	Are standard procedures posted in the loading area?				
3	Is storm water free of any visible chemical sheens or debris?				
4	Are absorbent materials and other spill response equipment kept nearby?				
	VEHICLE PARKING AREAS				
1	Is storm water in these areas free of visible chemical sheens or debris?				
2	Are spill kits located nearby to prevent spills from contacting storm water?				
	SEDIMENT AND EROSION CONTROLS				
1	Is storm water free from any visible sediment or debris?				
2	Is the facility free of any soil erosion?				
	RAW METAL/EQUIPMENT/MATERIAL/CHEMICAL STORAGE AREAS				
1	Is appropriate lighting provided for nighttime operations?				
2	Is storm water in these areas free of any visible chemical sheens or debris?				
3	Are absorbent materials and other spill response equipment kept nearby?				
4	Are these areas free of any open containers exposed to storm water?				
	BEST MANAGEMENT PRACTICES				
1	Are Good Housekeeping measures sufficient?				
2	Are inspections conducted on a regular basis?				
3	Are employees trained on pollution prevention measures?				
4	Are spill cleanup materials readily available in adequate amounts?				
5	Are engineering controls working?				
6	Are Spill Prevention and Response measures sufficient?				

Inspector Name: **Date:**

Signature:

QUARTERLY VISUAL EXAMINATION REPORT

Completed By:		Date of Last Rainfall >0.1"	
Title:		Today's Rainfall Amount (in)	
Date/Time		Today's Rainfall Duration (hrs)	

Storm Water Outfall #	1	2
Time		
Nature of Discharge		
Color[a]		
Odor[b]		
Clarity[c]		
Floating solids/ List	Yes/ No	Yes/ No
Settled solids	Yes/ No	Yes/ No
Suspended solids	Yes/ No	Yes/ No
Foam	Yes/ No	Yes/ No
Oil Sheen	Yes/ No	Yes/ No
Other		
Problems encountered		
Probable source of storm water contamination, if any		

[a] Clear, Green, Gray, Brown, Other
[b] Septic, Rotten Egg, Other
[c] Clear, Slightly Cloudy, Mostly Cloudy, Opaque

Additional Comments:

STORM WATER INSPECTION CHECKLIST CORRECTIVE ACTION FORM

Container ID/ Description	Location	Corrective Action(s) Recommended	Responsible Person/Dept.	Date Implemented

Instructions: **Use this tracking form in conjunction with** *Monthly Inspection Checklist and Quarterly Visual Examination* **forms**

IMPLEMENTATION OF NEW BEST MANAGEMENT PRACTICES

Instructions: Develop a schedule for implementing each newly selected BMP. Briefly describe each BMP, the steps necessary to implement the BMP (i.e., any construction or design), the schedule for completing those steps (list dates) and the person(s) responsible for implementation.

BMPs	Description of Action(s) Required for Implementation	Scheduled Completion Date(s) for Req'd Action	Person Responsible for Action(s)	Notes

PREVENTATIVE MAINTENANCE INSPECTION LOG		
Date	*Inspector*	*Actions Required*

NON-STORM WATER DISCHARGE ASSESSMENT AND CERTIFICATION

Completed by:_____

Title: _____

Date: _____

Date of Test or Evaluation	Outfall Directly Observed During the Test (identify as indicated on the site map)	Method Used to Test or Evaluate Discharge	Describe Results from Test for the Presence of Non-Storm-Water Discharge	Identify Potential Significant Sources	Name of Person Who Conducted the Test or Evaluation

CERTIFICATION

I, _____ (responsible official), certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name & Official Title (type or print)	B. Area Code and Telephone No.
C. Signature	D. Date Signed

ANNUAL COMPREHENSIVE SITE COMPLIANCE EVALUATION

A. GENERAL INSPECTION FINDINGS

1. As part of this comprehensive site inspection, did you inspect all potential pollutant sources, including areas where industrial activity may be exposed to storm water?
   ☐ YES ☐ NO

   If NO, describe why not:

2. Did this inspection identify any storm water or non-storm water outfalls not previously identified in your SWPPP?
   ☐ YES ☐ NO

   If YES, for each location, describe the sources of those storm water and non-storm water discharges and any associated control measures in place:

3. Did this inspection identify any sources of storm water or non-storm water discharges not previously identified in your SWPPP? ☐ YES ☐ NO

   If YES, describe these sources of storm water or non-storm water pollutants expected to be present in these discharges, and any control measures in place:

4. Did you review storm water monitoring data as part of this inspection to identify potential pollutant hot spots?
   ☐ YES ☐ NO ☐ NA, no monitoring performed

   If YES, summarize the findings of that review and describe any additional inspection activities resulting from this review:

5. Describe any evidence of pollutants entering the drainage system or discharging to surface waters, and the condition of and around outfalls, including flow dissipation measures to prevent scouring:

6. Have you taken or do you plan to take any corrective actions, as specified in Part 3 of the permit, since your last annual report submission (or since you received authorization to discharge under this permit if this is your first annual report), including any corrective actions identified as a result of this annual comprehensive site inspection?
   ☐ YES ☐ NO

NOTE: *Complete the attached Corrective Action Form (Section C) for each condition identified, including any conditions identified as a result of this comprehensive storm water inspection.*

B. INDUSTRIAL ACTIVITY AREA SPECIFIC FINDINGS

In reviewing each area where pollutants may be exposed to storm water, you should consider:

- Industrial materials, residue, or trash that may have or could come into contact with storm water;
- Leaks or spills from industrial equipment, drums, tanks, and other containers;
- Offsite tracking of industrial or waste materials from areas of no exposure to exposed areas; and
- Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas.

☐ SWPPP in the process of being updated. See updated SWPPP for details.

C. CORRECTIVE ACTIONS

Complete this section for each specific condition requiring a corrective action or a review determining that no corrective action is needed. Copy this section for additional corrective actions or reviews.

Include both corrective actions that have been initiated or completed since the last annual report, and future corrective actions needed to address problems identified in this comprehensive storm water inspection. Include an update on any outstanding corrective actions that had not been completed at the time of your previous annual report.

1. Corrective Action# ☐☐ of ☐☐ for this reporting period.

2. Is this corrective action:

   ☐ An update on a corrective action from a previous annual report; or

   ☐ A new corrective action?

ANNUAL COMPREHENSIVE SITE COMPLIANCE EVALUATION

C. CORRECTIVE ACTIONS (Continued)

3. Identify the condition(s) triggering the need for this review:
   - ☐ Unauthorized release or discharge
   - ☐ Numeric effluent limitation exceedance
   - ☐ Control measures inadequate to meet applicable water quality standards
   - ☐ Control measures inadequate to meet non-numeric effluent limitations
   - ☐ Control measures not properly operated or maintained
   - ☐ Change in facility operations necessitated change in control measures
   - ☐ Average benchmark value exceedance
   - ☐ Other (describe): _____

4. Briefly describe the nature of the problem identified:

5. Date problem identified: ☐☐ / ☐☐ / ☐☐☐☐

6. How problem was identified:
   - ☐ Comprehensive site inspection
   - ☐ Quarterly visual assessment
   - ☐ Routine facility inspection
   - ☐ Benchmark monitoring
   - ☐ Notification by EPA or State or local authorities
   - ☐ Other (describe): _____

7. Description of corrective action(s) taken or to be taken to eliminate or further investigate the problem (e.g., describe modifications or repairs to control measures, analyses to be conducted, etc.) or if no modifications are needed, basis for that determination:

   Curbing is planned to be installed to redirect storm water flow.

8. Did/will this corrective action require modification of your SWPPP? ☐ YES ☐ NO

9. Date corrective action initiated: ☐☐ / ☐☐ / ☐☐☐☐

10. Date correction action completed: ☐☐ ☐☐ ☐☐☐☐ or expected to be completed: ☐☐ / ☐☐ / ☐☐☐☐

ANNUAL COMPREHENSIVE SITE COMPLIANCE EVALUATION

1. Corrective Action # ☐☐ of ☐☐ for this reporting period.

2. Is this corrective action:
   - ☐ An update on a corrective action from a previous annual report; or
   - ☐ A new corrective action?

3. Identify the condition(s) triggering the need for this review:
   - ☐ Unauthorized release or discharge
   - ☐ Numeric effluent limitation exceedance
   - ☐ Control measures inadequate to meet applicable water quality standards
   - ☐ Control measures inadequate to meet non-numeric effluent limitations
   - ☐ Control measures not properly operated or maintained
   - ☐ Change in facility operations necessitated change in control measures
   - ☐ Average benchmark value exceedance
   - ☐ Other (describe): _____

4. Briefly describe the nature of the problem identified:

5. Date problem identified: ☐☐ / ☐☐ / ☐☐☐☐

6. How problem was identified:
   - ☐ Comprehensive site inspection
   - ☐ Quarterly visual assessment
   - ☐ Routine facility inspection
   - ☐ Benchmark monitoring
   - ☐ Notification by EPA or State or local authorities
   - ☐ Other (describe): _____

7. Description of corrective action(s) taken or to be taken to eliminate or further investigate the problem (e.g., describe modifications or repairs to control measures, analyses to be conducted, etc.) or if no modifications are needed, basis for that determination:

8. Did/will this corrective action require modification of your SWPPP? ☐ YES ☐ NO

9. Date corrective action initiated: ☐☐ / ☐☐ / ☐☐☐☐

10. Date correction action completed: ☐☐ / ☐☐ / ☐☐☐☐ or expected to be completed: ☐☐ / ☐☐ / ☐☐☐☐

This evaluation serves as a written summary of the findings. Action to correct any noncompliance issues will be made and retained in the records appendix of the SWPPP for 3 years from the date of the evaluation. If any areas of concern are identified, the SWPPP must be revised as appropriate within 2 weeks of the evaluation and implementation of any changes to the plan will be made within 12 weeks after the evaluation. If none is identified, the report will contain a certification that the facility is in compliance with this Plan and the permit. The report will be signed by a responsible corporate official.

☐ *"The facility is in compliance with the SWPPP and the TMSP."*
☐ *Any noncompliance found will be addressed within the required timeframe cited above."*

nexAir LLC. Official – Printed Name	Date
nexAir LLC. Official – Signature	Date

Appendix F
Training Records

TRAINING SIGN-IN SHEET

Facility: nexAir, Millington, Tennessee **Trainer:**

Date:

My signature below certifies that I have attended the Storm Water Pollution Prevention Plan Training Class. Also, I have read the sections of the plan that apply to my job duties and clearly understand my responsibilities concerning the prevention of potential pollutants entering storm drainage systems and this facility's dedication to the quality of water which exits the facility.

	Print Name	Signature	Job Title
1.			
2.			
3.			
4.			
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