

***INSTALLATION
STORMWATER PROGRAM
MANAGEMENT GUIDE***



**A Reference for Implementing and Managing
U.S. Air Force
Stormwater Programs**

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**Headquarters Air Force Center for
Environmental Excellence
Environmental Quality Directorate
HQ AFCEE/EQ
3207 North Road
Brooks AFB, TX 78235-5363**

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Capt. Mike Van Valkenburg	HQ AFCEE/EP
Jay Shah	HQ USAF/CEVC
Vic Verma	HQ AFCEE/CCR-A
Johnny Combs	HQ AFCEE/CCR-D
Charles Lee	HQ AFCEE/CCR-S
Jim Lafrenz	HQ AFCESA/CES
Frank Castaneda	HQ AFCEE/CM
Sue Stell	HQ AFRES/CEV
Dennis Kirsch	HQ AETC/CEVR
Maj. Roger Bousum	HQ AETC/SGPB
Jim Robertson	7 CES/CEVC

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ABBREVIATIONS AND ACRONYMS LIST

AAFES	Army and Air Force Exchange Services
AF	Air Force
AFCEE	Air Force Center for Environmental Excellence
AFCESA	Air Force Civil Engineering Support Agency
AFFF	Aqueous Film-Forming (or Fire Fighting) Foam
AFI	Air Force Instruction
AGE	Aerospace Ground Equipment
BCE	Base Civil Engineer
BCP	Base Comprehensive Plan
BEE	Bioenvironmental Engineer
BES	Bioenvironmental Engineering Services
BGP	Baseline General Permit
BIF	Boiler or Industrial Furnace
BMP	Best Management Practice(s)
BOD ₅	5-Day Biochemical Oxygen Demand
BX	Base Exchange
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COD	Chemical Oxygen Demand
COE	(U. S. Army) Corps of Engineers
CWA	Clean Water Act
DERA	Defense Environmental Restoration Account
DOD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
ECAMP	Environmental Compliance Assessment and Management Program
EIS	Environmental Impact Statement
EMF	Environmental Management Function
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	(U. S.) Environmental Protection Agency
EPC	Environmental Protection Committee
EPCRA	Emergency Planning and Community Right-to-Know Act

FFCA	Federal Facility Compliance Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FOTW	Federally-Owned Treatment Works
FWPCA	Federal Water Pollution Control Act
GIS	Geographical Information System
HQ	Headquarters
IAW	In accordance with
IDTP	Individual Development Training Plan
IRP	Installation Restoration Program
JACE	Judge Advocate for Civil Engineering
MAJCOM	Major Command
MAP	Management Action Plan
MILCON	Military Construction
MS4	Municipal Separate Storm Sewer System
MSGP	Multisector General Permit
NEPA	National Environmental Policy Act
NOD	Notice of Deficiency
NOI	Notice of Intent
NON	Notice of Noncompliance
NOT	Notice of Termination
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
OPA 90	Oil Pollution Act of 1990
P ²	Pollution Prevention
PCB	Polychlorinated biphenyl
PE	Professional Engineer
PM	Particulate Matter
POC	Point of Contact
POM	Program Objective Memorandum
POTW	Publicly-Owned Treatment Works
PPAT	Pollution Prevention Action Team
PPWG	Pollution Prevention Working Group
PRP	Potentially Responsible Party
QA/QC	Quality Assurance/Quality Control
QAF	Quality Air Force

RCRA	Resource Conservation and Recovery Act
REO	(AFCEE) Regional Environmental Officer
RFA	RCRA Facility Assessment
RFI	RCRA Facility Inspection
RPM	Remedial Program Manager
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Organization
SIC	Standard Industrial Classification
SOQ	Statement of Qualification
SPCC	Spill Prevention, Control and Countermeasures
SWMM	Stormwater Management Model
SWP ³	Stormwater Pollution Prevention Plan
TDS	Total Dissolved Solids
TEAM	The Environmental Assessment and Management Guide
TKN	Total Kjeldahl Nitrogen
TO	Technical Order
TOC	Total Organic Carbon
TRI	Toxic Release Inventory
TSCA	Toxic Substance Control Act
TSD	Treatment, Storage and Disposal
TSDF	Treatment, Storage, or Disposal Facility
TSS	Total Suspended Solids
USAF	United States Air Force
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WET	Whole Effluent (Toxicity) Test(ing)
WIMS-ES	Work Information Management System-Environmental Subsystem

1. INTRODUCTION

Why worry about stormwater?

What is this guide all about?

The Clean Water Act (CWA) requires industrial facilities to reduce, minimize, or eliminate sources of pollution exposed to stormwater runoff. The goals of the CWA are to make the rivers, lakes, and streams fishable, swimmable, and drinkable. To achieve this, the CWA requires that industrial facilities obtain a stormwater National Pollution Discharge Elimination System (NPDES) permit and implement a Stormwater Pollution Prevention Plan (SWP³). Air Force bases are included in the industrial activities that must obtain a permit and implement a SWP³.

This guide is intended for use by the base level environmental manager who is responsible for implementing the stormwater program and by other base environmental managers. The guide is a resource that assists the program manager in coordinating the efforts of base personnel to ensure compliance with requirements of the stormwater permit. The guide assumes that the program manager is new to the base and to the environmental field. The guide attempts to provide material that will be useful in achieving compliance such as checklists, training slides, background information, and tips for compliance. Nothing will ever replace the creativity and ingenuity of the program manager, this guide is only intended to assist them in running the program.

This guide will be updated to reflect changes in stormwater regulations and requirements. For further information on this guide, or to make comments and suggestions, contact the Air Force Center for Environmental Excellence (AFCEE) Pollution Prevention Directorate at:

HQ AFCEE/EP
3207 North Road
Brooks AFB, TX 78235
DSN 240-3371

2. REGULATORY BACKGROUND AND FRAMEWORK

2.1 Federal Stormwater Program

Where did this all begin?

When were stormwater discharges regulated?

Preventing stormwater pollution is the law. For the past 25 years, Congress has been passing laws and the U.S. Environmental Protection Agency (EPA) and states have been implementing regulations to require industries to reduce pollution to the nation's waterways.

2.1.1 Federal Water Pollution Control Act (Clean Water Act [CWA])

In 1972, the United States Congress passed the Federal Water Pollution Control Act (FWPCA) Amendments to restore and maintain the chemical, physical, and biological integrity of the nation's waterways. The goal was to make navigable waters safe for fishing, drinking, and swimming. This Act established the NPDES program, which required industries and municipalities to obtain permits and to meet criteria for discharging wastewater into waterways.

In the CWA, 1977, the United States Congress gave the EPA the authority to control discharges from point-sources. The EPA initially focused on the discharge of waters from industrial processes and from publicly-owned treatment works (POTWs). Stormwater discharges were, for the most part, not scrutinized or required to be permitted.

2.1.2 1987 CWA Amendments

In 1987, amendments to the CWA (Section 402[p]) were passed that addressed the EPA's regulation of stormwater discharges. Several of these regulations were aimed at industrial activities which occur on Air Force installations. The amendments are implemented in two phases.

Phase I involves regulating stormwater discharges from industrial activities that have the greatest potential to contaminate stormwater runoff. Affected industrial sectors include: manufacturing; transportation; landfills; wastewater treatment facilities that produce more than 1 million gallons per day; hazardous waste storage, treatment, or disposal activities; construction sites over 5 acres; and others. Phase I of the CWA amendments are in effect.

Phase II is designed to spread the coverage of stormwater permits to other areas. Examples include golf courses, housing areas, construction sites of less than 5 acres, large parking areas, gas stations, and Municipal Separate Storm Sewer Systems (MS4s) serving populations of less than 100,000. Phase II was recently published but will not be an impact on Air Force installations until 2001 when permitting is required.

What activities are required to be permitted?

2.1.3 Permitting

In 1992, the EPA issued general permits for the activities affected by Phase I of the CWA amendments. These permits established general requirements for discharges from regulated industrial activities in states where the EPA still controls the stormwater permitting program (See Appendix A). On 29 September 1995, the EPA issued a multisector general permit for 29 industrial categories. This permit grouped similar industries together by type, and each type has its own set of permit requirements and conditions. See Section 2.4.1 and Appendix H for further information on permit types and requirements.

Most states have the authority to administer the stormwater program, which includes issuing permits. (See list of delegated states in Appendix A.) Delegated states have been issuing both general and individual stormwater permits since 1992.

2.1.4 Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS) Code Summary

The EPA currently classifies facilities by a Standard Industrial Classification (SIC) code. However, a new classification system, North American Industry Classification System (NAICS) is being prepared to replace the old SIC system. Currently, SIC and NAICS codes group industries according to their type of activity and by their potential to pollute. Air Force installations have several industrial processes that may require permitting. Some of these processes are listed below.

Table 2-1: Typical Air Force SIC and NAICS Codes

Industrial Category	SIC Code	NAICS
Aircraft	3721	336411
Plating	3471	332813
Aircraft Engine Parts	3724	336412
Guided Missile & Space Vehicles	3761	336414
Transportation	4111	485111
Terminal and Service Facilities for Motor Vehicle Passenger Transportation	4173	48849
Transfer without Storage	4212	562112
Airports, Flying Fields, and Airport Terminal Services	4581	48819
Sewerage Systems	4952	22132
Refuse Systems	4953	562111 562211
Recycling	5093	42193
Facilities Support	8744	56121
National Security	9711	92811

The states vary between a liberal and a strict interpretation of which SIC codes apply. The state regulatory agency can provide guidance regarding the interpretation that will be applied to your installation.

Stormwater regulations only apply to certain industrial activities. At a typical Air Force base, this would include activities such as:

- aircraft/vehicle/equipment (includes aerospace ground equipment [AGE]) maintenance and repair,
- aircraft/vehicle/equipment fueling,
- aircraft/vehicle/equipment washing,
- corrosion control operations,
- maintenance of equipment in support of bulk fuel storage, both aviation and motor vehicle fuel,
- warehousing operations if the material being stored has the potential to contaminate stormwater,
- hazardous material storage,
- roads and grounds maintenance, and
- entomology operations.

Administration buildings, education/training buildings, housing areas, dormitories, and shopping areas are normally excluded from Phase I permitting. If activities that can impact the stormwater system, such as vehicle maintenance in parking areas, regularly occur in these areas, they may have to be permitted. See Section 4.2.4 for information on specific SIC codes.

2.2 State Stormwater Programs

Who issues the stormwater permit?

Currently, there are several states that do not have stormwater permitting authority or primacy. In those states, the EPA regional offices implement the stormwater program. An installation located in a state in which the EPA is the lead regulating authority has essentially three permitting options: 1) seek coverage under the general permit, 2) seek coverage under the multisector general permit, or 3) apply for an individual permit (See Section 2.4.1).

If the EPA has delegated authority to a state, the situation becomes more complicated. Some states have established several general permits based on types of industrial activity. In this case, an installation may have to comply with several state general permits depending on the types of industrial activities on the installation. Some states, such as Kentucky, require the installation to choose the most applicable industrial category, and follow those permit requirements.

2.3 Regulatory Involvement

Will the base be inspected by regulators?

What are the regulators going to want to look at?

Several states, such as, Washington, Florida, and Mississippi may have primacy for stormwater issues, but do not provide regulatory oversight for federal facilities. Also, some nonprimacy states may have separate stormwater requirements. Therefore, the state and regional regulatory representatives should be contacted to provide guidance for regulatory compliance.

2.3.1 Compliance Inspections

Regulators must monitor the compliance status of permitted installations in order to ensure compliance. Regulators can become familiar with compliance status by reviewing citizen lawsuits, complaints from employees and/or affected or concerned individuals, audits, self-reporting by the installations, and compliance inspections by other regulators. One aspect of compliance inspections includes multimedia inspections. The EPA multimedia inspections are generally conducted once every four years depending on the environmental sensitivity of an installation and the availability of resources. The state may assist the EPA during the multimedia inspections. Compliance inspections may also be conducted by state and local regulators. State inspections are generally done once a year. The frequency of local inspections vary and they are usually conducted by local authorities and POTW authorities.

Regulators are not required to give any advance notice for inspections, and installations are obligated to provide access to inspectors during working hours. Regulators gather data by reviewing facilities' records, conducting a visual inspection of facilities or sites, interviewing operation personnel, and taking samples as deemed appropriate.

2.3.2 Records Review

Regulators may conduct a thorough review of operating records, which include:

- discharge monitoring reports;
- operating log books;
- inspection reports by installation personnel;
- permits (stormwater permits and NPDES permits for wastewater);
- plans (SWP³, Sampling and Analysis Plan, and Action Plans to take corrective or proactive actions);
- procedures (written procedures at an installation that delineate program management responsibilities and allocate resources);
- notifications and reports to regulators; and
- investigation reports of spills and pollutants in stormwater.

What happens if my base receives a violation?

All records should be kept accurate and up-to-date and any erroneous or out-of-date material should be removed. Records must be available on site for a specified time period (see Section 3.2.2), then they must be archived. This time period is 1-3 years; however, it is generally recommended that records be retained for 5 years and then archived.

2.3.3 Enforcement Actions

The EPA and/or the state can take enforcement actions against individuals and/or installations for noncompliance. Recipients of enforcement actions are referred to as potentially responsible parties (PRPs). If an installation is not in compliance with permit conditions, regulators may require corrective actions. Also, regulators can impose civil and criminal penalties against PRPs. However, sovereign immunity has not been waived in the CWA yet, so civil penalties cannot currently be enforced against the Air Force. This could change in the future as already experienced in the Resource Conservation and Recovery Act (RCRA) program. Depending on the type and sensitivity of a violation and the history of the violator, a regulatory agency may choose to:

- issue a Notice of Deficiency (NOD) to advise an installation to take appropriate corrective action;
- issue a Notice of Noncompliance (NON) that requires an installation to come into compliance, though may not require a written response (generally more serious than a NOD, but not as serious as a NOV);
- issue a Notice of Violation (NOV) that requires a written response from an installation, to either achieve compliance (generally within 30 days) or submit an action plan for achieving compliance (action plans must be approved by regulators);
- require a compliance agreement between the installation and regulator(s) to finalize corrective actions and milestones;
- seek the help of a court to trigger a Consent Decree between an installation and regulator(s); and
- seek the help of a court to impose injunctive relief and/or criminal penalties.

If a criminal action is brought against an individual, representation by the Department of Justice will be determined in accordance with 28 CFR 50.15(a) and (b). The installation legal counsel may represent the individual if legal action is brought against the installation and the individual is named. There is no attorney-client relationship between the installation legal counsel and an individual service member or employee if legal action is only brought against the individual. Installations must provide the requested information to

Where can I get help with my permit?

2.4 Base Level Stormwater Pollution Prevention Program

What are the different types of Phase I permits?

regulators on or before the deadlines, and they must immediately notify their Major Command (MAJCOM) of any new violations. The installation must ensure that Air Force (AF) SLA/Judge Advocate for Central Region (JACR) is notified of the violation through legal channels. MAJCOMs should then immediately notify the Regional Environmental Officer (REO) of new violations and keep the REO fully informed of actions taken or planned. Installations must take all verbal and written communications seriously to achieve and maintain compliance with the applicable environmental laws.

2.3.4 Technical Assistance

The EPA has several publications (see Section 7) which can help installation personnel achieve and maintain compliance with stormwater requirements. Installations/MAJCOMs should seek assistance with state regulations from the Air Force REOs who are located in Atlanta, Dallas, and San Francisco. A list of state and EPA Points of Contact (POCs) is provided in Appendix C; REO POCs are provided in Appendix D. Another excellent source for technical assistance is PRO-ACT, an environmental information clearing house managed by the AFCEE Pollution Prevention Directorate. PRO-ACT can be contacted at DSN 240-4214 or (800) 233-4356. Additional information on PRO-ACT is provided in Section 5.2 and Appendix G.

The following sections provide installation-level personnel with information on permits and plans and how to work with the regulators of the federal and/or state stormwater programs. Since it is not practical to discuss individual state requirements, the following sections discuss the EPA's permitting structure and requirements.

2.4.1 Phase I Stormwater Permits

Currently, there are several types of stormwater permits which can be classified in different categories: preexisting permits, general permits, multisector general permits, individual permits, and construction permits. All of these are NPDES permits. Air Force installations in states with primacy will normally apply for the state general permit. Under the general permit, the installations are issued a document with an authorization number that allows operation under the EPA permit. Where there is no state program, installations will usually apply for coverage under an EPA general or multisector general permit. **All installations must have submitted a Notice of Intent prior to the regulatory-specified date of 27 April 96.**

2.4.1.1 Preexisting Permits

If an installation already has a NPDES permit, it is the regulators' choice as to how they handle stormwater requirements. Regulators may have already included stormwater discharge

requirements in the installation permit. If not, the regulators may elect to modify the permit to include stormwater requirements, or they may wait until the current NPDES permit expires and add stormwater requirements at that time.

2.4.1.2 Baseline General Permits

Baseline general permits are more desirable than individual permits because they are usually less stringent and less expensive to implement. The EPA issued a baseline general permit in the 9 September 1992 *Federal Register* (pgs. 41235 - 41356). Installations can apply for coverage under this permit by filing an EPA Notice of Intent (NOI) or the state equivalent, whichever is required by the permitting authority. The regulator will review the application and if it is approved, an approval package (copy of the permit or only a letter) will be sent to the installation. At that time, the installation is committed to following the permit conditions as outlined in the *Federal Register* or the state permit. The requirements in the baseline general permit are not subject to negotiation. The EPA baseline general permit expires in September 1997. The installations operating under this permit will be notified of appropriate renewal procedures by the EPA prior to the permit expiration date.

2.4.1.3 Multisector General Permits

The EPA has developed an industry-specific, multisector general permit. This permit was issued on 29 Sept 95 and many Air Force installations are now covered by the multisector permit rather than the baseline permit. Based on similarity of activities, the 700 group applicants were placed into 29 industrial sectors. The EPA incorporated the permit requirements of these 29 sectors into one general permit. However, each of these sectors has its own set of permit requirements and conditions. Air Force installations can fall into several established industrial categories, depending on the type of installation activities. Because of this, the installation will have to comply with all requirements in those permit sections. See Section 2.1.4 for typical categories and Appendix H for a summary of the EPA Multisector Permit.

If the general permit or multisector general permit application is rejected or not allowed by the regulator, an installation will be required to apply for an individual permit.

2.4.1.4 Individual Permits

Installations may already have an individual permit, or may choose to apply for one. This requires EPA Forms 1 and 2F, or the state equivalent. Individual permits are beneficial because they are tailored to each individual installation and are under the installation's control.

What is the Stormwater Pollution Prevention Plan (SWP³)?

However, these permits can be more detailed in monitoring requirements and are generally more expensive to implement and take much longer to obtain. After applying for the individual permit, an installation will be able to negotiate its requirements with the regulators during the draft/public notice period.

2.4.1.5 Renewal of Installation Stormwater Permits

At least 180 days prior to the expiration of a stormwater permit, the installation stormwater program manager must file an application for renewal for individual NPDES stormwater permits. However, renewal dates are subject to change for installations with regulatory primacy and for installations operating under an EPA baseline general permit. Once a draft permit is received from the regulators, the installation stormwater program manager should coordinate this permit with the applicable Air Force REOs to ensure a consistent application of environmental standards across regions. The installation program manager should use the checklist from Appendix K for information on proper review and coordination of draft permits and the installation's response to regulator(s).

2.4.1.6 Construction Permits

Construction permits are different because they are only needed when an installation has construction activity including clearing, grading, and excavation on sites of five or more acres. To obtain a construction permit, the installation must file a NOI with the regulating authority two days before the work begins. A site-specific SWP³ will also be required. Further details are provided in section 3.2.2.5.

2.4.2 Stormwater Pollution Prevention Plans

Stormwater permits require that each installation: (1) prepare a SWP³, (2) monitor stormwater discharge, (3) train employees, and (4) inspect the installation. (Monitoring requirements are discussed in Sections 3.2.4 and 4.3, training requirements in Section 3.4, and inspection requirements in Sections 3.2.1 and 4.2.) The stormwater plan is a self-implementing plan for compliance with the requirements of the stormwater permit. The goal of the SWP³ is to reduce or eliminate potential sources of pollution before a wet weather event occurs. The key elements of the SWP³ are to:

- identify the potential sources of stormwater pollution and evaluate their potential impact;
- manage sources of potential pollution by procedures called best management practices (BMPs);

2.5 Interrelation with Other Regulations, Programs, and Plans

How does the stormwater program interact with other environmental programs?

Can the SPCC plan help in my stormwater program?

- inspect the entire installation, including industrial activities, and review the plan annually to ensure that pollution prevention and control procedures are effective and current; and
- train employees on stormwater pollution prevention.

All facilities should have a SWP³ in place. Further information on plan writing and updating is available from several sources listed in Section 7.

The stormwater program manager should be aware of other regulations, programs, and plans that can impact the stormwater program. Each of these areas should be reviewed when writing and updating a SWP³. The following sections present some of the other environmental programs that can have an impact on the different areas of a stormwater program. This list is not intended to be all-inclusive. The programs themselves, as well as the reference materials in Section 7.0, should be consulted for more complete information. See Appendix B for regulatory citations for each of these areas.

2.5.1 Pollution Source Identification and Inspection

The following is a list of other environmental plans and programs which identify sources of pollution that could impact stormwater runoff:

- **National Environmental Policy Act (NEPA)** documents, Environmental Assessments (EAs), and Environmental Impact Statements (EISs) provide valuable information about the impact of ongoing and changing missions on the environment. These documents present detailed information on new and existing processes and their potential impact on stormwater runoff.
- The **Spill Prevention, Control and Countermeasures (SPCC) Plan** (required under the CWA) contains a comprehensive inventory of hazardous materials used and stored throughout the installation. This list can be used for developing sampling requirements and may be used in filing for the stormwater permit. The SPCC Plan and the SWP³ have similar requirements.
- The stormwater program manager should be familiar with any installation **Wetlands Permits** (also required under the CWA). The permits will typically have sampling requirements to monitor for release of contaminants when a wetlands is being disturbed, or if stormwater discharges to a wetland.
- Installations that are pursuing or have obtained treatment, storage, or disposal facility (TSDF) permits have had a **RCRA Facility Assessment (RFA)** with a follow-up **RCRA Facility Inspection (RFI)**. These documents provide valuable information concerning potential discharges of hazardous materials/waste.

- **Oil Pollution Act of 1990 (OPA 90)** Facility Response Plans are required for certain facilities that have a significant amount of stored or transferred petroleum products. Runoff from such facilities could impact stormwater runoff.
- **The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)** regulates the storage and application of pesticides. Pesticides and herbicides are a leading cause of stormwater pollution. Stormwater runoff through pesticides storage areas and application practices must be closely monitored.
- **The Emergency Planning and Community Right-to-Know Act (EPCRA) Compliance Program/Toxic Release Inventory (TRI)** reporting program establishes requirements for inspecting and reporting releases from Superfund Amendments and Reauthorization Act (SARA) Title III, Section 313 facilities. The stormwater manager should be familiar with all Section 313 chemicals on site. There are special requirements for Section 313 chemicals in the stormwater plan.
- **Executive Order (EO) 12856** requires federal facilities to take the lead in complying with federal, state, and local environmental requirements by developing a Pollution Prevention Plan. In the Air Force, this involves completing: (1) a Baseline Survey of the processes on the base; (2) an Opportunity Assessment that looks for methods to prevent pollution through waste minimization, material substitution, or process change; and (3) a Management Action Plan, which states how the installation will implement the identified opportunities from the Opportunity Assessment. This process provides a good reference for what kinds of materials are used on the installation and what materials may be used in the future.
- The stormwater program manager should be familiar with the **Lead-Based Paint Management Plan**. Lead-based paint normally becomes an issue during building maintenance, renovation, and demolition. Stormwater can be impacted if lead paint enters the stormwater system. Close monitoring of such construction and facility maintenance activities is essential for compliance with lead abatement regulations. Provisions for capture and removal of paint particles should be included in construction contracts where paint removal will be done outside.
- The **Polychlorinated Biphenyl (PCB) Management Plan** should list where PCB-laden materials (regulated under the Toxic Substances Control Act [TSCA]) are stored on the base. The facilities where these materials are stored should be inspected regularly. Stormwater runoff should not be allowed to come in contact with any PCB-contaminated material.
- The **Asbestos Management Plan** identifies where asbestos containing materials are located on the base. Asbestos is not typically a stormwater pollution concern, but when asbestos fibers

What base documents can help me develop my BMPs?

enter the stormwater runoff, the asbestos could become friable if the material is allowed to become deposited and dry.

2.5.2 Managing Pollution Sources with Best Management Practices

The following is a list of plans and programs that have valuable information for the preparation and implementation of BMPs within the SWP³.

- **NEPA** requires installations to assess the environmental effects of all proposed and ongoing actions that have the potential to impact the environment. Such actions include demolition, new construction, modification of existing facilities, relocation of equipment and process chemicals, plans and procedures, procurement of contract services/water treatment services, janitorial services, and other actions with potential impact on stormwater. The process of identifying environmental impacts through NEPA can identify new BMPs for the stormwater program, which can aid in the NEPA documentation process by identifying existing processes that can minimize environmental impacts.
- The **SPCC Plan** contains many elements that are similar to BMPs in the SWP³. Spill prevention is a key element of both plans. However, a SWP³ actually has more aggressive requirements than the SPCC plan, but the SPCC plan can still help in the development of BMPs.
- **Water Quality Management Plans** under the Safe Drinking Water Act (SDWA) recommend and implement stormwater pollution control measures by issuing permits, building POTWs, and instituting BMPs for nonpoint source pollution and other means (40 CFR 130.1[d]). In addition, the **Wellhead Protection Plan** is a voluntary program in most states that is designed to protect the recharge zones of aquifers used for drinking water. The plan uses pollution prevention and material control practices to minimize the risk of pollutants entering into the well discharge zone.
- The **OPA 90 Plans** address many of the same concerns covered by the SPCC, Pollution Prevention, and SWP³ plans. These concerns include the use of pollution prevention equipment, spill response training of operating personnel, use of secondary containment, and oil spill contingency planning. The **Facility Response Plan** is a source of information on the fuel storage and transfer operations at an installation and could provide insight for stormwater management needs.
- The **Opportunity Assessment/Management Action Plan (EO 12856)** is an excellent reference document for development of BMPs. The plan requires federal facilities and agencies to eliminate or reduce the unnecessary acquisition and use of extremely hazardous materials or toxic chemicals. The pollution

What other programs can help?

reducing procedures utilized in the plan will either directly affect contaminants entering stormwater runoff, or will reduce the effects of a potential spill.

- The **Hazardous Waste Minimization Plan** requires the identification of methods for reducing or eliminating hazardous waste streams on the installation. This mirrors the goals of both the Pollution Prevention Plan and the SWP³, which are to eliminate pollution at the source. The elements of the Hazardous Waste Minimization Plan should be coordinated with the BMPs of the SWP³.

2.5.3 Information Available From Other Regulations and Plans

All of the previously mentioned regulations and plans are useful when updating the SWP³ and stormwater permit. The following regulations and plans will also help.

- The **Clean Air Act (CAA)** has imposed several reporting requirements that apply to Air Force installations. Consideration must be given to CAA requirements on stormwater collection and transport systems, such as an emission inventory of the potential air sources that could contribute particulate matter (PM) or other contaminants that could be captured in the stormwater runoff. Volatile Organic Compounds (VOCs) from treatment units such as oil/water separators are a growing concern and their impact should be evaluated. Another concern is fugitive emission sources that introduce pollution into the air that may settle and become part of the stormwater runoff.
- The **Federal Facility Compliance Act (FFCA)** requires waste streams to be identified as hazardous or nonhazardous prior to their release to the treatment facility. If hazardous wastes are present, pretreatment or removal of the wastes may be required. This applies whether the installation discharges to a POTW or to a Federally-Owned Treatment Works (FOTW). Coordination with the treatment works is essential.
- EO 12856 requires that federal facilities comply with the **SARA Title III Section 313** requirements which are applicable only if the installation manufactures or processes more than 25,000 pounds of a regulated substance, or if the substance is otherwise used in quantities exceeding 10,000 pounds annually. SARA Title III requires installations to enact emergency procedures in response to the releases of hazardous substances, to submit material safety data sheets, to maintain an annual inventory in a specified format for hazardous chemicals located on site in regulated quantities, and to annually submit a TRI for those chemicals exceeding the annual threshold quantities. (Note: use of petroleum products such as gasoline and JP-8 are normally exempt from Section 313 reporting.

Storage of petroleum products is reportable under Section 312, not 313.)

The TRI contains information on releases into the environment (including stormwater) for specified toxic chemicals that have been manufactured, processed, or used in threshold quantities during the previous calendar year. For water priority chemicals (those chemicals which have a potential to be released to water), just as for all other chemicals regulated under EPCRA, installations must develop efficient and accurate means for tracking the location and quantities of regulated materials from their initial receipt at the installation, through their use in a process, to their ultimate disposal. The SWP³ should address measures for preventing the water priority chemicals from coming into contact with stormwater.

- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/Installation Restoration Program (IRP)** sites exposed to stormwater runoff must be included in the SWP³. Any projects or measures affecting stormwater runoff from IRP sites must be coordinated with and approved by the state and/or federal Remedial Program Managers (RPMs).
- Consideration must be given to the **Natural/Cultural Resources Program** when updating the SWP³ and stormwater permit. Issues to deal with include addressing possible changes to land management, floodplains and wetlands, fish and wildlife management, endangered species, and buildings of historical significance.
- The stormwater program manager should be familiar with the **Watershed Management Program**. The manager should know the name of the watershed receiving installation stormwater, the exact location of discharge, and the current watershed use and standards. Current and forecasted watershed standards may impact the installation stormwater permit limits. General watershed management requirements and standards are from the CWA.
- Section 12 of **The Environmental Compliance Assessment and Management Program (ECAMP) and The Environmental Assessment and Management (TEAM) Guide** includes checklists for stormwater pollution prevention measures. These checklists should be reviewed during internal and external ECAMPs, and a check of overall stormwater pollution prevention program compliance status should also be conducted. These inspections may be helpful in the quarterly and annual facility inspections.
- The **Oil/Water Separator Management Plan** provides documentation on the oil/water separators on the installation; develops a schedule for replacement, upgrade, or removal of oil/water separators; determines responsibility for maintenance and operation of oil/water separators; and establishes training requirements for those responsible for maintaining and operating

oil/water separators. Oil/water separators are covered under the stormwater permit in most states, but Air Force policy is to minimize or eliminate the use of oil/water separators due to the potential liability they pose from improper management or from leaks and spills. If oil/water separators are proposed as a BMP, a thorough analysis should be made to determine if an oil/water separator can treat the waste stream effectively, if a closed-loop system or connection to the sanitary sewer is possible, and if the design is suitable to contain any leaks or spills from the oil/water separator. Refer to Headquarters (HQ) Air Force (AF)/(CEV) policy letter, *Oil/Water Separators Operations, Maintenance and Construction*, dated 21 October 1994, for additional information.

- The **Base Comprehensive Plan (BCP)** includes environmental tabs that may be a source of information and a valuable tracking mechanism for SWP³ projects. The tabs are a substitute for a Geographical Information System (GIS), until such a system is available at the base level. Eventually, SWP³ data may be available in a GIS format that will be available to interact with programming, design, and operational activities on the base.

3. STORMWATER PROGRAM MANAGEMENT

3.1 Installation Program Management

Who is involved in the stormwater program?

The installation environmental management organization has primary responsibility for the maintenance of the SWP³. The SWP³ requires a qualified individual or team of individuals to be responsible for developing and assisting with the implementation of the SWP³. A SWP³ program manager can be appointed to accomplish these functions, however, for larger installations with significant stormwater issues/activities, a pollution prevention team made up of competent organizational representatives should be formed. There must be a clear delineation of responsibilities given to each team member. The team may be comprised of representatives from Maintenance, Services, Supply, Civil Engineering, Medical, Army and Air Force Exchange Service (AAFES), and tenants.

How is senior leadership involved?

3.1.1 Senior Management Roles and Responsibilities

The installation senior management supports the goals of the SWP³ program. The Installation Commander is responsible for the overall compliance with the stormwater permit provisions. The Base Civil Engineer (BCE) normally executes the stormwater program ensuring that conditions of the permit are met, that the necessary resources are budgeted and requested, and that appropriate staff are assigned to manage the program. Other senior managers, the Logistics Group Commander, the Operations Group Commander, etc., ensure that their operations comply with stormwater permit provisions and that their personnel are aware of permit requirements.

What is the role of the Environmental Protection Committee (EPC)?

3.1.2 Environmental Protection Committee (EPC)

The EPC is the principal environmental oversight and policy-making body at the installation. It is composed of senior installation management representatives and legal officers along with tenant representatives. The Wing Commander, or designee, serves as chairman. The EPC approves and authorizes the SWP³ and is also responsible for approving periodic modifications to the stormwater plan to reflect changes to the installation's mission, processes, organization, and changes in environmental regulations.

3.1.3 Pollution Prevention Working Group (PPWG)

The PPWG is a group created to coordinate all pollution prevention activities and to report the status of all significant activities to the EPC. Its membership is composed of management representatives from the various installation squadrons and the Environmental Management Function. The EPC chairman usually designates a PPWG chairman. Typically, the Environmental Flight Chief is chosen for this position. The PPWG establishes tasks for each organizational unit with regards to the SWP³, ensures that the tasks are communicated and carried out, and coordinates changes to the plan.

Who are suggested players in the PPWG?

At each meeting, the PPWG presents reports to the EPC that cover the status of all areas under its responsibility, including stormwater pollution prevention activities. The PPWG also seeks approval from the EPC for plan changes and for any other necessary action. The PPWG typically consists of the following members:

- **Environmental Flight Chief.** Acts as overall program manager for the stormwater program. Serves as chairman of the installation stormwater pollution prevention team. Ensures that the training, sampling record keeping, inspections, updating, and reporting requirements of the stormwater permit are met.
- **Engineering Flight of Base Civil Engineering.** Provides technical guidance on the structural components of the stormwater system and coordinates on BMPs involving structural changes.
- **Staff Judge Advocate.** Updates the team on changes in state and federal regulations and the potential impacts they may have. Advises the installation commander on legal implications of stormwater permit issues.
- **Bioenvironmental Engineering.** Collects stormwater samples, obtains laboratory analyses, and reviews and evaluates sample results. Updates the team on changes in sampling procedures and leads efforts to find the sources of pollution identified via the sampling and analysis program.
- **Logistics.** Provides information on hazardous material and petroleum storage, implementation of BMPs at processes such as vehicle and aircraft maintenance, and the status of stormwater training in the logistics squadrons.
- **Operations.** Provides input on changes in flying operations and flightline maintenance processes affecting the stormwater program and implementation of pollution prevention practices.
- **Services.** Provides input on efforts to control stormwater pollution from food service facilities (such as maintenance of grease traps), and public awareness efforts concerning vehicle maintenance at dormitories and transient facilities.

3.1.4 Pollution Prevention Action Teams (PPATs)

Under the Quality Air Force (QAF) concept, process action teams are proposed as a method to define and remedy installation problems, thereby improving organizational performance. The team is made up of a small group of individuals (3-10) from a specific work area or from personnel drawn from different work areas, who have a common vested interest in making specific process improvements. This approach is applicable to addressing many types of workplace problems. Formal methods for the formation and operation of process

Who actually runs the stormwater program?

What are their responsibilities?

action teams have been developed and are available through the Quality Office at each installation. Improvements in pollution prevention practices through recognition, definition and analysis of problems, and developing problem solutions, is particularly appropriate to stormwater pollution prevention. It is strongly recommended that the PPWG develop methods for establishing PPATs throughout the installation to address pollution prevention improvement, which includes stormwater pollution prevention.

3.1.5 The Environmental Management Function (EMF)

Because each MAJCOM may have different organizational structures for the management of installation environmental responsibilities, the term Environmental Management Function will be used for the installation group which has the primary responsibility for ensuring environmental compliance, pollution prevention, and site restoration. The EMF plays the leading role in the successful implementation of the stormwater pollution prevention plan.

The EMF must have an individual designated with the principal (but not necessarily sole) responsibility for stormwater plan and program implementation and stormwater regulatory compliance. This person:

- acts as the coordinator of all stormwater-related activities;
- leads the PPWG through preparing the meeting agenda, scheduling meetings, and preparing briefings for this group;
- carries out taskings from the PPWG, setting up and working as facilitator with PPATs;
- interfaces with other installation managers in determining their needs for training or equipment to implement BMPs;
- arranges for training;
- develops and submits budget items;
- contracts for needed services;
- assures that stormwater permit requirements are complied with at all times;
- keeps records and assures that all documentation is complete and current;
- functions as plan manager and coordinator; and
- assures that all construction NOIs are filed as required, that construction SWP³s are prepared, and that construction Notices of Termination (NOTs) are made.

3.2 Stormwater Pollution Prevention Plan Management

What is this SWP³ all about?

How often do we inspect?

What records do I have to keep and how long do I have to keep them?

In the event that the installation receives a stormwater regulatory violation, the EMF has the primary responsibility for ensuring that the violation is corrected and for working with regulators to clear the violation.

The SWP³ has two major objectives: (1) to help identify the sources of pollution that affect the quality of industrial area stormwater discharges, and (2) to describe and ensure the implementation of practices to reduce pollutants in industrial area stormwater discharges. Each installation should have a SWP³ in place. The following sections highlight the key areas of a **TYPICAL PLAN**.

Each installation will have a unique regimen of the guidance for site-specific information.

3.2.1 Inspections

Each installation will have a unique regimen of inspections based on permit requirements. For installations with the EPA general permit, the following table represents a typical inspection regimen.

Table 3-1: Inspection Schedule

Inspection	Frequency
Installation Inspection	Quarterly
Comprehensive Site Inspection	Annually
Compliance Inspection	As Required
Drainage Structures	Spring/Fall

A report or memo for record must be prepared to document inspection findings. Significant changes noted during the inspection must be included in a revision to the SWP³ within 14 days of the inspection. Refer to section 4.2 for technical details of the inspection process.

3.2.2 Record Keeping

To effectively manage the SWP³ program, numerous databases and record keeping requirements must be established and maintained. Records from SWP³ activities should be kept with the SWP³ for easy retrieval. All inspection, sampling, and training records must be retained for three years after the permit expires, or five years after the activity is completed, whichever is longer.

Who is responsible for sampling?

The installation should keep records to document compliance efforts during the life of the permit. Regulations only require sampling results and training records to be maintained for one year after the permit expires. However, since many of these permits may stay in force for more than five years, it is recommended that all records be maintained for the life of the permit plus three years. After this time, all records should be archived.

Individuals with expertise in stormwater pollution prevention should be assigned the responsibility of maintaining the SWP³ records. The following items require continuing oversight to ensure compliance with the SWP³. Individual plans or permits may require additional records, but the following sections address minimum requirements.

3.2.2.1 Analytical Results from Sampling

The Bioenvironmental Engineering Services (BES) staff is responsible for conducting stormwater sampling in accordance with (IAW) Air Force Instruction (AFI) 48-119, *Medical Service Environmental Quality Programs*. Sampling procedures for permit compliance should be established to ensure that analytical results are reviewed by a competent authority. The SWP³ program manager must transfer sample results onto the appropriate forms and submit them or keep them on site as designated in the permit.

A database of the sampling results should be maintained to allow easy access for trend analysis. This will help to characterize stormwater runoff, to compare runoff with information on the local watershed, and to identify sources of pollution during periods of discharge. Trend analyses should be reported to the EPC annually or as situations change.

The EMF and BES should establish sampling results files for each stormwater outfall for easy access during program reviews, ECAMPs, and regulatory agency visits. The EPA requires sampling results to be maintained for three years after the permit expires or for six years after the date of collection, whichever is longer. Additional data retention information can be found in the installation permit.

When do I reapply for the permit?

3.2.2.2 Permit Reapplication

A tracking mechanism should be established to identify when the stormwater permit expires. It is important to allow adequate lead time to prepare and process the documents for permit renewal. The application deadline for permit renewal may differ from state to state, but it is usually due 180 days before permit expiration.

The EMF and BES should review the installation stormwater permit requirements for reporting monthly, quarterly, semiannual, or annual monitoring results for all active and inactive outfall monitoring locations. The EMF should develop a tracking mechanism to ensure that reports are submitted in accordance with permit requirements.

How often do I conduct training?

3.2.2.3 Training

Training is normally required annually. The SWP³ program manager must develop a stormwater training database that includes dates of training/certification, and identifies which individuals require refresher training. Further information on training is provided in Section 3.4. Several training programs are currently available through the AFCEE and the PRO-ACT.

Who do I contact at the regulatory agency if I have questions?

3.2.2.4 Regulatory Contacts

A comprehensive list of regulatory agency contacts should be maintained by the SWP³ program manager. Appendix C provides a list of state contacts. Additionally, records should be established which document telephone/written correspondence regarding good faith activities by the base to meet permit requirements. These records should be easily accessible and should provide documentation for program reviews, regulatory visits, and ECAMPs.

What do I need to know about all the construction at my base?

3.2.2.5 Construction Activities

The installation SWP³ program manager should be included in the coordination of all construction activities requiring a site-specific SWP³. Construction contract specifications must spell out the process by which the contractor provides appropriate notices and plans to the installation for review and approval. For example, copies of the NOI and compliance site inspections should be requested by the installation of the construction contractor for submittal to the regulators. Also, the site-specific SWP³ must be in place before the NOI is filed and the NOI must be submitted (postmarked) two days before construction commences. At the completion of the contract, NOTs must be submitted to the regulators to close out the project file. It is the installation's responsibility to sign and submit the notices and stormwater plan to the regulators. (For further information, see the *Federal Register* from 9 September 1992, p. 41209 and 41176; and *Stormwater Management For Construction Activities: Developing Pollution Prevention Plans and Best Management Practices*, Office of Water, EPA 832-R-92-005, USEPA, 1992.)

3.2.2.6 Structural Contributors to Stormwater Runoff

A database of oil/water separators, grease/sand traps, and authorized cross-connections must be maintained. As projects to correct unauthorized discharges to stormwater are completed, this database must be updated to reflect these changes. Separators and traps must be maintained and any unauthorized connections must be removed from the storm drain system and plugged.

3.2.2.7 Meeting Logs

Meetings that are held to discuss the installation's SWP³ should be documented and maintained in the EMF's files. Meetings with regulatory agency representatives, the SWP³ team, the Pollution Prevention Subcommittee, and other installation organizations should be well documented and should include a list of attendees, the issues discussed, and action items required.

3.2.2.8 Site Inspection Reports (Field Reports)

The SWP³ program manager must maintain records of site inspections as directed by the installation's stormwater NPDES permit. Inspections may be conducted by the SWP³ program manager or by a competent authority who is trained in SWP³ management. If the site inspections are conducted by a contractor or Corps of Engineers inspector under a construction permit, procedures should be established describing who will conduct the inspections, where the inspection reports are filed, and how the SWP³ program manager will be notified when inspections identify deficiencies. The SWP³ program manager should track these deficiencies through the completion of corrective actions. All inspection records should be kept in the SWP³ file.

When and what do we report to the regulators?

3.2.3 Notification/Reporting

The EMF has the responsibility to assure that all reports and notifications are submitted in a timely fashion. In general, reporting requirements (such as sampling results) are specified in the permit. It is important to be aware that additional reporting requirements exist for installations which are subject to EPCRA (Section 313) reporting for water priority chemicals. The following items are generally required by the permit to be submitted to the appropriate state or federal regulatory agency:

- Releases of hazardous substances in an amount equal to or exceeding reportable quantities must be reported no later than 24 hours after there is knowledge of the spill event. Also, the stormwater plan must be modified to reflect in detail the

What are the typical pollutants sampled for?

circumstances of the event and the preventive actions that were taken. This modification must be completed within 14 days of the spill event.

- If applicable, a letter from the Installation Commander designating other installation personnel (by title, not by name) who have the authority to sign correspondence, reports, applications, certifications, plans, or any other written information of an official nature concerning stormwater permit compliance. (See Appendix E for a sample delegation letter.)
- Serious problems which are causing noncompliance and efforts to overcome such problems should be reported. This is not a regulatory requirement, but will assist in avoiding citations for permit violation. Such information should be submitted to regulatory agencies only with the concurrence of the environmental legal counsel.
- Any other documentation concerning the plan or amendments to the plan must be provided if specifically requested by the regulatory agency.

Each state may have unique requirements with regard to notification/reporting. Refer to Appendix A, Federal and State Stormwater Programs, for more detailed information on a specific state.

3.2.4 Sampling and Analysis

Monitoring is a program, or a set of activities, conducted to measure the effects of installation operations on the environment and/or the effectiveness of pollution abatement measures that are conducted to diminish environmental impacts. A monitoring program can include site inspections, flow calculations, sampling, and toxicity testing. The program stipulates where to sample, how to sample, sampling frequency, and which pollutants are to be monitored. The stormwater permit will require monitoring for certain industrial activities. Sampling and analysis is one method of determining the quantitative impact of regulated activities on stormwater runoff. It involves the physical act of collecting the sample and having the sample analyzed for pollutants.

The parameters that must be monitored and analyzed will be cited in the stormwater permit. Analysis of both grab and composite samples may be required. Commonly cited parameters include: oil and grease, pH, total suspended solids (TSS), total Kjeldahl nitrogen (TKN), 5-day biochemical oxygen demand (BOD₅), chemical oxygen demand (COD), VOCs, phosphorous, nitrate/nitrite, benzene, ethylbenzene, xylene, toluene, naphthalene, metals, and the active ingredients in the deicing compounds used at an installation. Some permits may require whole effluent (toxicity) test(ing) (WET). During

Do we have to do everything at once?

What are BMPs and how can they help my base?

WET testing, the effluent is tested for the effect of all contaminants on fish and other wildlife. (Permittees may monitor for pollutants identified in Tables II and III of Appendix D of 40 CFR 122 in lieu of WET testing.) Installations should check their permits for monitoring requirements and options.

3.2.5 Implementation Schedule

Each SWP³ has an implementation schedule for projects and activities that must be completed to comply with terms of the stormwater permit. This schedule is enforceable by the regulators since the installation is required to institute a self-implementing compliance program. Projects and activities must be implemented immediately for most activities and projects, but no later than three years from the date the permit is issued for construction projects. The implementation schedule should be reviewed annually by the EPC for major changes or project delays. It is important that the installation set aside adequate time for any stormwater project's completion because delays may result in NOV's from a regulatory agency.

3.2.6 Best Management Practices

A BMP is a measure or control that an installation must implement wherever stormwater contamination exists. BMPs are a means to prevent pollution from being discharged to stormwater during wet weather events. These practices may be procedural, such as training in spill response procedures; structural, such as silt fences or oil/water separators; or administrative, such as record keeping. The initial SWP³ must identify a BMP for each identified potential source of pollution, along with a schedule for its implementation. The BMPs must be reviewed by the installation during the annual Comprehensive Site Compliance Inspection. The review must evaluate each BMP and determine if it is effective in preventing pollution. If the BMP is not effective, a revision must be produced and documented in the SWP³. The EPA manual for BMPs is called *Stormwater Management For Industrial Activities Developing Pollution Prevention Plans and Best Management Practices*, EPA 832-R-92-006, September 1992. Section 4.2 of this guide contains some of the specific BMPs found in the EPA manual.

Baseline BMPs involve working with procedures that have already been proven rather than implementing more costly structural controls. Baseline BMPs are inexpensive, relatively simple, applicable to many industries, and are usually nonstructural.

In some situations, where baseline BMPs are not adequate to solve stormwater pollution problems, advanced BMPs will be implemented. Advanced BMPs are tailored to specific needs; they are usually structural; and they may involve changes in a process,

containment and diversion, recycling, material substitution, or treatment. Advanced BMPs must conform to or be consistent with other installation environmental plans before they can be implemented.

Installations may have to prepare a BMP plan that satisfies a state-specified format. The BMP plan should be documented in a narrative form and should include any necessary plot plans, drawings, or maps. Other documents already prepared for the facility such as a Safety Manual or SPCC plan may be used as part of the BMP plan and may be incorporated by reference. A copy of the BMP plan shall be maintained at the facility and should be available to regulators upon request. The plan should address the following areas;

- BMP Committee,
- Reporting of Incidents,
- Risk Identification and Assessment,
- Employee Training,
- Inspections and Records,
- Preventative Maintenance,
- Good Housekeeping,
- Materials Compatibility, and
- Security.

The BMP Plan should be modified whenever changes at the facility increase the potential for significant releases of toxic or hazardous pollutants or where actual releases indicate the plan is inadequate.

When do I update the SWP³?

3.2.7 Stormwater Pollution Prevention Plan Updating

The SWP³ must be reviewed and updated annually during the Comprehensive Site Compliance Inspection. Any significant changes, deficiencies, or new activities must be noted in the SWP³ within 14 days of the inspection. A log documenting any changes to the SWP³ should be kept with the plan. Significant changes to the plan should be reviewed annually by the EPC.

Does my plan require certification by a Professional Engineer?

3.2.7.1 Certification by Professional Engineer

Certain industrial activities may be required to have their SWP³ certified by a professional engineer (PE) and reviewed and recertified by a PE every three years thereafter. In general, this requirement applies to facilities with RCRA TSDF, and EPCRA, Section 313 water priority chemical facilities. The PE certification must be kept with the

What if the regulations change?

SWP³. This requirement for PE certification has been eliminated in the EPA multisector permit.

3.2.7.2 Regulatory Change

Over the past several years, stormwater regulations have become fairly comprehensive. It is anticipated that regulatory agencies will focus their efforts on enforcing the rules and fine-tuning the regulations as more practical experience is achieved. The SWP³ structure must be flexible to accept change and be readily adaptable to any changes that fine-tuning will bring.

3.2.7.3 Organizational and Structural Change

Installation mission changes and personnel turnover are inevitable. The SWP³ must provide continuity and sustain the program through these changes. Timely maintenance of the SWP³ is an effective method of ensuring the required continuity.

As situations change, polluting incidents occur, or existing conditions affecting stormwater are discovered on the installation, the SWP³ must be updated to reflect these changes. Such items within the SWP³ that could require revision include, but are not limited to:

- Location and/or Type of Source Pollutants,
- Outfall Map,
- Updated Civil, Electrical, General Tabs,
- Site-Specific BMPs,
- Spill History,
- Training, and
- Notice of Intent.

One valuable source of information for updating the SWP³ is the NEPA documentation that is required to be submitted whenever proposed and ongoing actions have the potential to impact the environment. Such actions include demolition, new construction, modification of existing facilities, relocation of equipment and process chemicals, procurement of contract services/water treatment services, janitorial services, and other actions with potential impact on stormwater.

3.2.7.4 Coordination

Upon the completion of and following updates to the SWP³, the stormwater manager, through the EPC, should coordinate the plan with

3.3 Funding

the installation and organizational commanders, pollution prevention team members, and appropriate regulatory agencies.

A key part of the stormwater pollution prevention program is getting the necessary funding to execute the program. The following sections detail what criteria are used to evaluate funding requirements, where funds can be obtained, and general guidance on obtaining funding.

3.3.1 Source Criteria

The following criteria are applied to determine the most likely funding source for implementing the stormwater pollution prevention program.

3.3.1.1 General Criteria

There are several general criteria that stormwater pollution prevention requirements are evaluated against to determine the need for funds. Impacts to the health and safety of the public (i.e., installation personnel and dependents) receive the highest priority for funding. Other general criteria include: real or possible violation of a law or regulation, environmental impact, cost/benefit analysis and payback period, short- and long-term benefit, public awareness, previous commitments and promises to regulators and other government officials, and the chances of success of the proposed solution.

3.3.1.2 Federal Facility Compliance Agreements

If the installation has entered into a Federal Facility Compliance Agreement with the state in which stormwater program requirements are included, the Federal Facility Compliance Agreement will provide justification for funds that will be used to complete compliance projects within the set time schedule. All pollution prevention alternatives should be evaluated and prioritized before seeking compliance funds.

3.3.1.3 Monitoring Program

In an individual permit, the monitoring requirements are installation-specific, but general permits require monitoring of several kinds of industrial activities. Funding can be provided for monitoring equipment, sampling activities, contractor sampling, and lab analyses which are necessary for an effective stormwater monitoring program, and to meet permit requirements.

3.3.1.4 Training

The Individual Development Training Plan (IDTP) for installation personnel should include stormwater training requirements

so that adequate funding can be made available to meet SWP³ needs and permit requirements.

3.3.2 Sources of Funds

Environmental compliance funding requirements should be identified as specifically and as early as possible in order to reduce the impact of unanticipated requirements. This will make it easier to place requirements into a higher priority. Funds to ensure environmental compliance include:

- **Operations and Maintenance (O&M)** funds should be used for small construction projects that are compliance related and cost less than \$300,000. Operations and services can also be included in this funding source if they are required to support compliance with regulated requirements. Examples of O&M funding could be; covering a hazardous material storage area, constructing a sediment control dam, purchasing sampling equipment (this item must be less than \$25,000) and contractor-provided training or sampling. This is an annual program and is a quicker source of funds than Military Construction (MILCON) program funds.
- **Pollution Prevention (P²)** funds are available for funding pollution prevention equipment, assessments, and industrial process modifications. This funding source is similar to O&M funding.
- **Military Construction** funds are for construction projects over \$300,000. Examples include deicing chemical collection systems and drainage cross-connection elimination projects. This is a five-year funding program and will take longer to get than O&M funds.

The increasing emphasis on regulatory P² requirements has made it increasingly difficult to separate pure compliance actions from those actions that are essential for operating the system or for providing the service. Many environmental compliance requirements are embedded in essential operations and services. Examples include: routine operational testing of water and wastewater treatment plants; certification of plant operators; and routine cleaning, maintenance, and repair of systems to ensure efficient operating conditions.

All requirements must be entered in the A-106 process to be considered for funding. The A-106 process is a Department of Defense (DOD) programming and budgeting system for environmental compliance and P² requirements. The A-106 breaks down the Environmental Compliance Account into Operations and Services, O&M, P², and MILCON funding accounts. The installation EMF is the POC.

3.3.3 Funding Guidance

The *Guide Book for Environmental Compliance Program Objective Memorandum (POM) Cost Models* is a useful tool for determining priorities for the most effective allocation of resources to ensure that compliance requirements are not delayed due to a shortage of funds. The *Guide* provides general information on various funding categories available for environmental compliance projects and equipment. The *Guide* also includes the Air Force strategy for screening potential installation requirements.

The Cost Models do not automatically produce a funding input. The models require an analysis of the actual conditions and compliance requirements by knowledgeable users by comparing current and future operations against environmental constraints and limitations.

The *Guide* provides justification for stormwater program requirements; including current laws, regulations, and standards. It includes a discussion of the future regulatory trends and their impact on Air Force installations. The *Guide* identifies funding categories and programs, and defines expenses which can be funded from the Environmental Compliance Account. The execution strategies in the *Guide* are provided in the form of “If/Then” tables, which are a logical process for identifying requirements and for choosing appropriate options from available compliance accounts.

The General Stormwater Permit (9 September 1992 *Federal Register*, page 41309) requires employee training as a BMP. It states that “Employee training programs shall inform personnel responsible for implementing activities identified in the (plan) or otherwise responsible for stormwater management...of the components and goals of the (plan). The training requirement is sector specific under the EPA multisector permit. Training should address topics such as spill response, good housekeeping, and material management practices. The (plan) shall identify periodic dates for such training.” There is no detailed listing of training requirements, or the exact content or duration of training.

For installation employees and contractor personnel who work where Section 313 water priority chemicals are used or stored, regulations require training on pollution control laws and regulations, the SWP³, and particular features of the installation designed to minimize discharges. Such training must be conducted at least annually or at intervals specified in the SWP³. As stated in the General Stormwater Permit, temporary personnel (including contractor personnel) “...shall be informed of facility operation and design features in order to prevent discharges or spills from occurring.”

3.4 Training

What should my training program consist of?

The SWP³ must contain references to installation-specific training needs and should specify who will receive initial and annual refresher training. Contractor personnel must be included in the training program if they meet the functional descriptions of the regulation.

It is recommended that the EMF develop appropriate installation-specific training programs for internal use. The installation can seek outside professional assistance in developing and presenting training programs for installation personnel if needed. Suggested topics include: review of stormwater regulations, the permitting process, the elements of the stormwater P² plan, sampling requirements, BMPs, record keeping, and special situations which may be specific to the installations, such as use of deicing chemicals.

Documentation of all stormwater training is essential to prove compliance. It is highly recommended that an electronic database be developed to identify individual training/retraining requirements, and to document that the training has been provided. New employees should be provided with training within 90 days of assignment to a position that requires training. Records of training are to be kept indefinitely. It is recommended for a memorandum (or notation) stating that the employee has received training to be entered into each employee's personnel file.

What about training documentation?

3.4.1 Training Elements

Who needs the training?

Most stormwater permits require annual training as a minimum for individuals who handle potential pollutant sources. Personnel involved in the following activities require training:

- Fuel Handling,
- Vehicle and Aircraft Maintenance,
- Roads and Grounds,
- Landscaping Maintenance,
- Painting Operations,
- Construction Activities, and
- Hazardous Material/Waste Management.

What do I teach?

The training must cover a minimum of:

- Good Housekeeping,
- BMPs,
- Spill Response,

- Material Management, and
- Sediment and Erosion Control.

Classroom training using a format tailored to the specific requirements in the installation SWP³ is the most effective means of training. The stormwater video listed below can be used as a supplement to the classroom training, or as fill-in training for new people, reservists, or absentees. Training must be documented and the records must be retained on site.

3.4.2 Suggested Training Aids

There are two readily available training aids:

- The “Stormwater Pollution Prevention Training Slides Course” is a Microsoft Word based picture presentation designed to raise awareness of stormwater pollution prevention issues.
- A video titled “Stormwater Pollution Prevention Training.” Copies of this video can be obtained by contacting HQ AFRES/CEV, Ms. Sue Stell, DSN 457-1079; or HQ AFCEE/CCR-D, Mr. Johnny Combs, (214) 767-4671.

PRO-ACT, DSN 240-4214, has both the above training aids.

Members of the installation community who are not in the normal information chain regarding stormwater management can still have a significant impact on stormwater quality. Those involved in activities such as maintenance of personally-owned vehicles in unauthorized locations, dumping of wastes and chemical residues into storm sewers, and abandoned and leaking automobiles contribute to pollution of the stormwater. Efforts to make these individuals aware of stormwater requirements should be undertaken.

A considerable benefit can be gained through publicizing the stormwater P² program. These benefits can include reaching those members of the installation community who may be unaware of the reasons for the program (such as dependents and retirees), but who may be able to make positive contributions if they are properly informed and their input is solicited. Additionally, by widely publicizing the stormwater management program, an installation can make a positive impression on the local community and the regulatory agencies. Finally, such measures tend to increase the legitimacy of the program in the minds of those more directly involved, such as workers and contractor personnel.

An effective method for publicizing the stormwater P² program is the installation newspaper. It is recommended that the SWP³ manager work closely with the installation Public Affairs Office to develop a series of articles which explore the reasons for the program,

Where can I get help?

3.5 Community Awareness

how the program is being implemented, and also stresses the benefits of the program to everyone involved. This series of articles can, in effect,

be a stormwater training program for those who would otherwise not have any involvement.

Other methods for spreading information about the program include making presentations at local civic group meetings, presentations at technical society meetings, inclusion of stormwater protection programs in Earth Day activities, presentations at schools, writing articles for local, general-circulation newspapers, and the use of the installation's information television channel.

4. TECHNICAL IMPLEMENTATION

4.1 Technical Review

Preventing stormwater pollution sometimes involves physical changes to the base. How do I monitor these changes?

The previous sections described what stormwater management entails and how to manage the stormwater P² program. The next sections give the technical details necessary to implement the program; from reviewing projects with impacts on stormwater runoff, to inspecting the installation, to conducting stormwater sampling. This section gives details that should apply to most installations. The stormwater manager should also consult the reference materials in section 7.0.

The stormwater manager in the EMF must be very familiar with new projects coming to the base. The manager should be involved in all the steps of project execution, from programming through construction, and should also review projects for compliance with the stormwater requirements.

4.1.1 Project Coordination

4.1.1.1 Project Programming

Each facility project is identified to the Civil Engineering Squadron as a work order on an Air Force Form 332. The EMF should review each form 332 for compliance with the stormwater regulations and permit requirements (coordination with the Civil Engineering Operations and Engineering Flights will be required). The EMF should look for projects that have (as a minimum):

- Discharge to or connection of nonstormwater effluent to a storm sewer system;
- Construction activities which impact areas greater than five acres in aggregate; and
- Activities that will expose pollution to stormwater runoff (i.e., outside wash racks).

4.1.1.2 Design/Planning

Each project design/plan should be reviewed at either the 35-percent or 65-percent stage submittal by the EMF to ensure stormwater P² requirements are included in engineering designs and work order packages. Projects should include both temporary measures to prevent stormwater pollution due to construction activities and, depending on the scope of the project, BMPs from the installation stormwater permit.

4.1.1.3 Construction

Construction can affect stormwater by allowing runoff to erode disturbed earth. Construction activities which must be covered by a

What about the base construction program? Doesn't disturbing all that land affect stormwater runoff?

stormwater construction permit (total area impacted greater than five acres) are required to have a SWP³ that is specific to the activity. Contracts for applicable construction projects should include requirements for developing a SWP³. The SWP³ will identify control measures for runoff which may include:

- hay bales/barriers;
- silt fences; and/or
- rock dams.

As part of their regular inspections, the EMF should inspect the construction sites to verify that the measures specified in the SWP³ have been installed and are being maintained. These control measures must be maintained and remain functional for the duration of the activity.

All construction projects requiring a permit must have a NOI form filed two days prior to the start of construction, and a NOT form filed after all construction activities are complete. All of the NOIs/NOTs must be signed by the owner or operator of the installation, or their designee. This includes contractor operated installations. It is essential to coordinate permit filing and construction schedules with the Engineering Flight.

For projects that may be phased over several years due to funding limitations, the five-acre measure applies regardless of the number of years it takes to complete the project. For example, if a project is phased over several years for funding purposes or occurs on several different areas of the installation, the five-acre measure applies to the aggregate total of all phases. The five-acre measure is not applied to separate and distinct projects that are going on at the same time if each individual project is less than five acres.

4.1.2 Stormwater Pollution Prevention Plan Project Programming Requirements

Once a BMP is identified, what are the steps taken toward implementation?

The installation SWP³ is required to be reviewed at certain intervals. Any changes to the SWP³ which require work such as structural controls and maintenance should be initiated by the EMF or the owning organization and identified on an AF Form 332. Depending on the scope of the project, the AF Form 332 will be sent to either the Operations Flight for planning or to the Engineering Flight for programming. If the project ends up in the Engineering Flight, it will be put on programming documents to include a DD Form 1391 and will be included on the installation project program. Changes must also be entered into the A-106 program which is within the Work Information Management System-Environmental Subsystem (WIMS-ES) module. The A-106 process identifies the requirement from which the project is

4.2 Stormwater Pollution Prevention Plan Maintenance

**Why do we have to do all
this inspecting?**

**What do we look for when
we inspect the base?**

What do we inspect?

validated, approved, and funded. Coordination with engineering programmers as well as environmental programmers will be required.

4.2.1 Inspections

Inspections are the ongoing process for determining the effectiveness and efficiency of the SWP³. The stormwater management program is a dynamic program, and changes to the SWP³ should be expected. Inspections are a means for periodic review of the effectiveness of BMPs. They can determine the installation's permit compliance. Inspections can also determine permit compliance at construction sites. An inspector should be familiar with the conditions of the permit and with site-specific BMPs.

4.2.2 Evaluations

There are four specific things that the inspector should look for when evaluating a pollution prevention measure.

- Has the measure been installed or performed correctly?
- Have there been adverse impacts on measures previously accomplished?
- What should be done to correct observed problems with a measure?
- Is the BMP the correct one?

The stormwater program manager should review all areas of the installation that can impact stormwater runoff. Such a review should include:

- oil/water separators,
- discharge of noncontact cooling water,
- discharges from explosive ordnance disposal (EOD) facilities,
- open burning areas,
- open detonation areas,
- deicing operation areas,
- aqueous film-forming foam (AFFF) storage and usage locations,
- vehicle washing facilities,
- hazardous material outside storage areas,
- Defense Reutilization and Marketing Office (DRMO) storage areas,
- fuel storage areas,
- fueling areas,
- equipment maintenance and cleaning areas,

- aircraft maintenance and cleaning areas,
- drainage areas where erosion is possible,
- fire hydrant flushings,
- potable water treatment discharges including water line flushings,
- irrigation drainage,
- lawn watering runoff,
- washing of building exteriors using detergents or other chemical cleaning compounds,
- pavement washwaters in which spills or leaks of toxic or hazardous materials have occurred and in which detergents are used,
- air-conditioning condensate,
- spring runoff,
- surface discharge of contaminated groundwater,
- foundation or footing drains in which flows are contaminated with process materials such as solvents, and
- any other areas which could potentially impact stormwater.

4.2.3 Documentation

The inspector is responsible for documenting and keeping records of findings, requesting the physical facility changes, and requesting corrections to the SWP³.

4.2.4 Specific Industrial Activities

Every Air Force installation has industrial activities that could have an impact on the stormwater system. Stormwater runoff from these activities will be regulated by the stormwater permit. Table 4.1 lists many of these activities and SIC codes they are likely to fall under.

Table 4-1: SIC Codes For Typical Air Force Activities

SIC Code	Activity	Specific Function
0421 Trucking and Courier Services, Except Air	Vehicle Operations	<ul style="list-style-type: none"> • Base Vehicle Fuel Station • BX Gas Station • Bulk Storage Fill Station • Base Vehicle Maintenance Shop
3471 Plating	Plating Operations	<ul style="list-style-type: none"> • Plating Functions
3721 Aircraft	Aircraft Operations	<ul style="list-style-type: none"> • Aircraft Wash Racks • Aircraft Hangers • Airfield Apron Areas
3724 Aircraft Engine Parts	Aircraft Maintenance	<ul style="list-style-type: none"> • Flightline Maintenance Shops • Aircraft Corrosion Control Shop • Engine Maintenance/Testing Shops
3761 Guided Missile and Space Vehicles	Missile/Space System Operations and Maintenance	<ul style="list-style-type: none"> • Weapons Systems • Launch Platforms • Weapons Storage • Fuel Storage Areas • Missile Maintenance Areas
4111 Transportation	Vehicle Operations	<ul style="list-style-type: none"> • Vehicle Wash Rack • Fueling Station • Vehicle Maintenance
4173 Terminal and Service Facilities for Motor Vehicle Passenger Transportation	Vehicle Operations and Maintenance	<ul style="list-style-type: none"> • Base Vehicle Maintenance Shop • Base Vehicle Fuel Station • Base Transportation
4212 Transfer and Storage	Vehicle Operations	<ul style="list-style-type: none"> • Base Vehicle Maintenance Shop • Base Vehicle Fuel Station • Base Transportation
4225 Chemical Staging	Supply	<ul style="list-style-type: none"> • Large Quantity Chemical Storage • Outside Warehousing
4581 Airports, Flying Fields, and Airport Terminal Services	Airfield Operations	<ul style="list-style-type: none"> • Aerospace Ground Equipment • Aircraft Wash Racks • Aircraft Corrosion Control Shop • Airfield Apron Areas • Aircraft Refueling Stations • Bulk Fuel Storage Fill Station • Military Air Terminals • Aircraft Loading/Unloading Area
4952 Sewerage Systems	Wastewater Treatment	<ul style="list-style-type: none"> • Wastewater Treatment System
4953 Refuse Systems	Domestic Waste Streams	<ul style="list-style-type: none"> • Refuse Collection Areas • Landfills
5093 Recycling	Recycling	<ul style="list-style-type: none"> • DRMO
8744 Facilities Support	Facility Maintenance and Support	<ul style="list-style-type: none"> • Civil Engineering Maintenance Shops • Base Civil Engineering Yard • Contractor Equipment Staging Area
9711 National Security	Other Activities/Class-ified or Sensitive Military Operations	

What are we looking for at the construction sites?

4.2.5 Best Management Practices for Construction Areas

Construction activities represent a significant potential stormwater pollution hazard. Fortunately, the pollution can be prevented with fairly simple methods as listed below:

- Stormwater Flow Diversions (rerouting stormwater flow around the construction site)
- Sediment and Erosion Prevention Practices (Ref: EPA 832-R-92-005) (using filter fences, check dams, and sediment stabilization ponds)
- Infiltration Practices (Subsurface drains)
- Dust Control Practices (using water or chemical suppressants)
- Specific practices are listed in the above reference, in state erosion control handbooks, and as mandated by and specified by state law or local ordinances. Construction sites should be inspected on a monthly basis, or when new areas are disturbed.

4.2.6 Best Management Practices for Industrial Areas

Table 4.2 provides an overview of BMPs which may be applied to specific sources of stormwater pollution in industrial areas. (Reference: EPA 832-R-92-006, Chapter 4)

4.2.7 Best Management Practices for Drainage Areas--Spring and Fall Inspection Requirements

Table 4.3 is a list of good management practices for stormwater drainage areas that can be used as an inspection guide. (Ref: EPA 832-R-92-006)

Table 4-2: Best Management Practices for Industrial Areas

Site-Specific Stormwater Sources of Pollution	BMP	Specific Tasks
Vehicle, Aircraft, Equipment Maintenance Areas (Annual Inspection)	Stormwater Flow Diversions	<ul style="list-style-type: none"> • Direct stormwater away from these areas
	Exposure Minimization	<ul style="list-style-type: none"> • Curbing • Drip Pans • Collection Basins • Sumps • Vehicle Positioning • Roofing/Shelter
	Mitigative Practices	<ul style="list-style-type: none"> • Sweeping • Sorbents • Gelling Agents • Sealing of Floor Drains
	Other Preventive Practices	<ul style="list-style-type: none"> • Control Vehicle Washing
	Infiltration Practices	<ul style="list-style-type: none"> • Grassed Swales • Infiltration Trenches • Porous Pavements • Level Spreaders
Airfield Pavement and Other Surfaces (Annual Inspection)	Flow Diversion Practices	<ul style="list-style-type: none"> • Stormwater Conveyances • Graded Areas and Pavement
	Exposure Minimization Practices	<ul style="list-style-type: none"> • Collection Basins
	Mitigative Practices	<ul style="list-style-type: none"> • Sweeping • Sorbents • Gelling Agents
	Other Preventive Practices	<ul style="list-style-type: none"> • Dust Control
	Sediment and Erosion Practices	<ul style="list-style-type: none"> • Vegetative Practices
	Infiltration Practices	<ul style="list-style-type: none"> • Vegetated Filter Strips • Grassed Swales • Level Spreaders • Infiltration Trenches
Bulk Fuel Storage Facilities (Annual Inspection)	Flow Diversion	<ul style="list-style-type: none"> • Direct stormwater away from these areas
	Exposure Minimization	<ul style="list-style-type: none"> • Containment Diking • Curbing • Covering
	Mitigative Practices	<ul style="list-style-type: none"> • Sorbents • Gelling Agents
	Preventive Practices	<ul style="list-style-type: none"> • Monitoring • Signs and Labels
	Sediment and Erosion Control	<ul style="list-style-type: none"> • Vegetative Practices • Structural Erosion Control
	Infiltration Practices	<ul style="list-style-type: none"> • Porous Pavements

Table 4-3: Best Management Practices for Drainage Areas

BMP	Inspection Area
Good Housekeeping	<ul style="list-style-type: none"> • Outside areas neat and orderly • Evidence of drips or leaks from operating equipment machinery • Drainage conveyances clear of debris and trash • Dumpster pads clean and trash free • Evidence of fugitive dust • Evidence of waste disposal from industrial activities • Spill containment and cleanup plan in place and functional
Preventive Maintenance	<ul style="list-style-type: none"> • Maintenance of stormwater management devices (e.g., oil/water separators, retention/detention areas, inlets and catch basins) • Inspection and testing of equipment or mechanical systems used for stormwater management • Stormwater structures intact and free of cracks, erosion, or damage • EPCRA, Section 313 Facility Preventative Maintenance Inspection <p>Material storage areas for evidence of leaks, erosion, or fugitive materials</p>
Spill Prevention and Response	<ul style="list-style-type: none"> • Verify that spill prevention plans identify areas where spills can occur • Verify that spill prevention plans identify procedures for cleaning up spills • Ensure that people designated to perform spill containment and cleanup are trained • Ensure that materials or equipment required for spill containment and cleanup are in adequate supply and serviceable • Verify that spill plans include provisions for monitoring underground storage and transfer facilities
Sediment and Erosion Control (Reference Chapter 3, EPA 832-R-92-005, Sept. 92)	<ul style="list-style-type: none"> • Ensure that stormwater flow diversions have been installed and are being maintained • Ensure that federal- and state-mandated sediment and erosion prevention practices are being followed • Ensure that dust is being controlled and that the site maintains a log of when dust suppression methods, (i.e., watering) are utilized.
Outfall Evaluations (Reference EPA 600-R-92-238)	<ul style="list-style-type: none"> • Look for presence of sheens, floatables, color, odor • Look at dry weather flows for color, turbidity, temperature variations • Look for deposits and stains in area of outfall • Look for vegetative changes (overgrowth or dead and decaying) • Observe damage to outfalls (Physical)

4.3 Sampling and Analysis

What sampling is required?

How do we take stormwater samples?

4.3.1 Permit Requirements

Requirements for sampling and analysis vary from installation to installation depending on the type and conditions of the permit. The key to a successful and effective sampling and analysis program is to review and follow the requirements of the installation's stormwater permit. If the permit language is ambiguous or the requirements are difficult to understand, the appropriate federal or state agency should be contacted for further clarification. If the permit or sections of the permit are missing, contact the appropriate agency for a replacement.

4.3.2 Sampling

The following sections give typical permit-required sampling procedures for stormwater runoff. The installation-specific stormwater permit should be checked for exact requirements which could vary from the following discussion. Extensive information about sampling is contained in the NPDES Stormwater Sampling Guidance Document, EPA 833-B-92-001 and in 40 CFR 136.

4.3.2.1 Representative Storm Event

A representative storm event is usually defined as one when at least 0.1 inch of precipitation falls and at least 72 hours have elapsed since the last storm. Many permits require sampling after storm events.

4.3.2.2 Representative Outfalls

Stormwater sampling is generally performed at a point source which is also known as an outfall. An outfall is either where a conveyance such as a drainage pipe or stream crosses the installation boundary or discharges into a body of water such as a river or lake. Review the permit and/or SWP³ to determine at which outfall(s) sampling must be performed.

4.3.2.3 Frequency and Time of Year

The stormwater permit will cite how often sampling must be performed. Many permits also identify specific times of the year when sampling is required, particularly at those installations where deicing activities occur.

4.3.2.4 Sample Types

There are two types of samples required by most permits; grab samples and composite samples. Each permit will identify when and where the two types of samples must be taken. A grab sample is taken at a single time and location and is therefore representative of an

instantaneous condition, rather than the entire storm event. A composite sample is composed of numerous grab samples taken over a set of prescribed conditions such as time, flow, or volume. It represents the characteristics of the entire storm event.

4.3.2.5 Flow Measurements

Flow is the volume or quantity of water discharged over a period of time, whereas, flow rate is the volume of water discharged from a cross-sectional area per unit of time. Flow can be measured during a storm event in a number of ways. These include area and velocity measurements; primary flow measurement devices such as weirs, flumes, or using bucket and stopwatch methods; and secondary flow measurement devices such as pressure transducers or bubblers which are used in automatic sampling equipment.

4.3.2.6 Sampling Equipment

Stormwater samples can be taken manually or by using automatic samplers. Stormwater permits may have specific requirements as to the type of equipment that must be used. Manual samples are frequently required for oil, grease, and VOCs, although the newer automatic samplers are programmed for stormwater requirements and may be used in place of manual sampling. Manual sampling is labor intensive and personnel may not be available to conduct this type of sampling when the storm event occurs. Automatic samplers offer convenience and accuracy and can be equipped with rain gauges and flow meters.

4.3.2.7 Sampling Containers

Specific container types are required for various parameters. The required containers are listed in 40 CFR 136.3(e), Table II and in EPA 833-B-92-001, "Sampling Guidance Document." There are specific requirements for cleaning and preparing a container prior to sampling and these are also listed in 40 CFR 136. The correct type of container must be used in the collection of samples to ensure the compatibility between the parameter in question and the container type. Generally, glass containers are required for organic parameters and polyethylene for inorganic parameters. Containers are generally provided by the laboratory conducting the analysis. However, ample supplies should be made available for emergency situations.

4.3.2.8 Sample Preservation and Holding Times

Preservation techniques are used to maintain a sample's integrity until the analysis can be conducted. Samples can actually change chemically, physically, or biologically when preservation techniques are not used. Most samples must be cooled and maintained

What is a “chain-of-custody” form?

at 4°C and other samples may need to have an acid or base added to adjust the pH for preservation. An important component of preservation is the holding time, defined as the allowable time lapse between collecting a sample and the actual analysis of that sample. If holding times are exceeded, the results of analyses are invalid. It is recommended that local lab services be available at all times for emergency use.

4.3.2.9 Documentation and Chains-of-Custody

The final step in sampling is completing the paperwork and shipping the sample to the laboratory. The sample containers must be labeled, the chain-of-custody form must be filled out, and the samples must then be shipped to the laboratory.

A chain-of-custody form establishes a history of the sample(s). As each person accepts and relinquishes the samples, they sign the form. The chain-of-custody form includes the names of the persons collecting the sample; sample numbers; date and time of sample collection; location of sample collection; and names and signatures of all personnel handling the samples during transport, receipt at laboratory, and analyses.

Samples are usually shipped in a cooler to maintain the proper preservation temperature. Sample containers are typically either wrapped in a foam covering or placed into the cooler and packing is added. Ice or another cooling agent is added and the cooler is closed, sealed, and shipped. The chain-of-custody form should be attached to the cooler.

4.3.3 Analysis

Why do we have the samples analyzed?

Specific required analyses, test methods, or laboratory procedures may be identified in the stormwater permit. Often the permit cites the conditions listed in 40 CFR 136.

4.3.3.1 Required Analyses

Sampling is required for certain activities in the EPA general permit. The following table summarizes typical sampling requirements; including the frequency of sampling, type of sampling, and reporting requirements.

Table 4-4: Required Stormwater Analyses (Baseline Permit)

Type of Facility	Type of Stormwater Discharge	Parameters	Monitoring Frequency	Reporting Frequency
EPCRA, Section 313 Facilities Subject to Reporting Requirements for Water Priority Chemicals	Stormwater discharges that come in contact with any equipment, tank, container, or other vessel or area used for storage of a Section 313 water priority chemical, or located at a truck or rail car loading or unloading area where a Section 313 water priority chemical is handled	Oil and Grease, BOD ₅ , COD, TSS, TKN, Total Phosphorus, pH, acute whole effluent toxicity, any Section 313 water priority chemical for which the installation reports	Semiannual	Annual
Land Disposal Units/ Incinerators/ Boilers or Industrial Furnaces (BIFs)	Stormwater discharges from active or inactive land disposal units without a stabilized cover that have received any waste from industrial facilities other than construction sites; and stormwater discharges from areas around incinerators and BIFs that burn hazardous waste	Ammonia, Total Recoverable Magnesium (dissolved), TKN, COD, (TDS), (TOC), Oil and Grease, pH, Total Recoverable Arsenic, Total Recoverable Barium, Total Recoverable Cadmium, Total Recoverable Chromium, Total Cyanide, Total Recoverable Lead, Total Mercury, Total Recoverable Selenium, Total Recoverable Silver, Acute Whole Effluent Toxicity	Semiannual	Annual
Industrial Facilities with Coal Piles	Stormwater discharges from coal pile runoff	Oil and Grease, pH, TSS, Total Recoverable Copper, Total Recoverable Nickel, Total Recoverable Zinc	Semiannual	Annual
Airports (with over 50,000 flight operations per year)	Stormwater discharges from aircraft or airport deicing areas	Oil and Grease, BOD ₅ , COD, TSS, pH, and the primary chemical ingredient used in the deicing materials	Annual	Retain on site

The above sampling requirements are from the EPA general permit guidelines and may be different for each state and are provided only as an example.

4.3.3.2 Required Test Methods

There are specific test methods that must be used to analyze each of the various parameters. These may be listed in the stormwater permit or reference may be made to 40 CFR 136. Generally, several referenced methods are approved for each parameter in this document. Many approved test methods can be found in *Standard Methods for Examination of Water and Wastewater*, 1995 or *Methods for Chemical Analysis of Water and Wastes*, EPA 600/4-79-020, revised March 1983. Details of WET testing can be found in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fourth Edition EPA/600-40-90-027, September 1991. If an analytical method is not available in 40 CFR 136, then any suitable method can be used. Approval of the method by the regulatory agency may be required prior to its use.

4.3.3.3 Laboratory Selection

Laboratories should be selected according to their ability to perform analyses in accordance with 40 CFR 136. Some states require that the laboratory have state certification. To ensure that a laboratory is capable of performing the required methods, an installation can request a Statement of Qualification (SOQ). The SOQ will detail the types of analyses that the laboratory is both experienced and qualified to perform; it should also describe quality assurance procedures and capabilities, and the minimum quantitative limits (detection limits). Details for evaluating and dealing with laboratories can be found in *Guidance on Evaluation, Resolution, and Documentation of Analytical Problems Associated with Compliance Monitoring*, EPA 821-B-93-001, June 1993. Proximity to a laboratory should also be considered because some parameters have very short holding times; for example BOD₅ samples have a holding time of 48 hours. Agreements with the selected laboratory should stipulate the parameters to be analyzed, the sample types, the methods of analysis, turnaround times, and pricing information. The more information stipulated by an installation, the better.

4.3.3.4 Quality Assurance/Quality Control (QA/QC)

QA/QC measures are an integral component of both sampling and analysis. Equipment and trip blanks are recommended in the field. Blanks should consist of the reagent-grade water used at the laboratory performing the analyses and should be treated in the same manner as the samples themselves. These blanks are used to detect contamination that may have occurred during the sampling or preservation processes.

How do we choose a lab?

Many analytical methods have very detailed QA/QC measures for ensuring sample integrity. The selected laboratory must abide by these measures. Examples of general laboratory QA/QC measures include purity and traceability of reference standards; number of calibration points; linearity of calibration; precision and recovery; analysis of blanks; and recovery of spikes. Laboratory analytical data should always be reviewed, and in many cases, validated prior to acceptance, use, and reporting. It should be determined that the laboratory tested the samples properly, used appropriate methods, achieved levels of protection, and calibrated the equipment regularly. If analyses are invalidated because of laboratory error, then the laboratory should be responsible for reanalyzing the samples at no additional cost.

4.3.4 Reporting and Record Keeping

The stormwater permit will specify where, when, and in what form monitoring data must be submitted to the applicable federal and state agency. Noncompliance with terms of the stormwater permit may have to be reported to the applicable agency within a prescribed time period.

All records of monitoring activity and results, copies of reports, and data must be retained by the installation for a certain period of time, typically three years after the permit expires or six years after collection. In addition, all information must be attached to the installation's SWP³, or kept in the same file. **It will be difficult to prove permit compliance to regulators if records are not kept current, available, and accurate.**

5. RESOURCES FOR PROGRAM RESOLUTION

5.1 The Air Force Center for Environmental Excellence

We're not sure we're doing everything right. Where can we go for help?

The installation SWP³ program manager has many resources available for assistance. The Air Force agencies listed below can provide assistance. In addition, Appendix C lists the state stormwater program and permit managers.

AFCEE was established to provide support to installations in environmental, design, and construction services. The Pollution Prevention Directorate (HQ AFCEE/EP) specifically assists the installation in water and wastewater issues (including stormwater) in the form of implementing guides, contractual support through a variety of contracting vehicles, and other consultant or crossfeed services. (HQ AFCEE/EP, 3207 North Road, Brooks AFB, TX 78235, DSN 240-3371).

The AFCEE Construction Management Directorate provides program management support to selected base MILCON projects (including water and wastewater treatment projects) as directed by MAJCOMs and HQ United States Air Force (USAF). (HQ AFCEE/CM, 8004 Arnold Drive, Brooks AFB, TX 78235-5361, DSN 240-4222).

The AFCEE Planning and Conservation Directorate provides program management support with NEPA documentation review as well as contract management services. (HQ AFCEE/EC, 3207 North Road, Brooks AFB, TX 78235, DSN 240-3384).

5.1.1 PRO-ACT

The AFCEE Pollution Prevention Directorate manages an environmental information clearinghouse called PRO-ACT. The purpose of PRO-ACT is to answer questions and provide timely information on specific environmental questions posed by installation personnel. For stormwater, this may include specific interpretive guidance, copies of briefing slides, technical information on stormwater P² technologies, and regulatory updates. (See Appendix G) (PRO-ACT, 3207 North Road, Brooks AFB, TX 78235, DSN 240-4214, (800) 233-4356)

5.1.2 Regional Environmental Offices

The Air Force has established three REOs to serve as a liaison between the Air Force and the state and federal regulatory agencies. These REOs are located in Atlanta (Eastern Region), Dallas (Central Region), and San Francisco (Western Region). The stormwater experts in the REOs serve as the Air Force's spokespersons on regional environmental matters. REOs help MAJCOMs and installations deal with enforcement actions, ensure that reports between regulatory agencies and the Air Force are consistent, and provide environmental services to the senior Air Force leadership as needed. Guidance on interfacing with the regulatory agencies for any environmental concern, including stormwater issues, is provided by the REOs. (See list of POCs in Appendix D.)

5.2 The Air Force Civil Engineering Support Agency (AFCESA)

AFCESA provides technical support to the Air Force Engineer for design and construction of facilities. AFCESA is the technical program manager for standards and criteria for drainage basin evaluation and structural solutions. The stormwater program manager is Mr. Jim Lafrenz, DSN 523-6332. (HQ AFCESA/CES, 139 Barnes Drive, Suite 1, Tyndall AFB, FL 32403).

5.3 Major Commands

Each MAJCOM maintains a headquarters environmental staff that has the responsibility for assisting its installations in improving environmental performance. Each MAJCOM environmental staff will have a designated individual(s) who can provide advice and assistance concerning interpretation of stormwater regulations and for obtaining funding requirements to achieve compliance. In most cases, the MAJCOM environmental staff representative should be the initial contact made in such matters.

5.4 Headquarters Air Force

The Air Force Civil Engineering Office establishes and distributes environmental policy to the field. They are also the overall program managers for the Air Force environmental programs. The office also interfaces with the Federal Regulator's Headquarters Offices. (See address and phone number of POC in Appendix C).

The EPA has groundwater monitoring software on the internet that is available for downloading free of charge. The program is called Stormwater Management Model (SWMM) and may be downloaded from the EPA's internet site at http://www.epa.gov/docs/swmm_windows/. To run this model requires the following hardware: 80386 processor, 5 mg hard disk space, 530K of DOS memory.

6. CONCLUSION

Managing an effective stormwater pollution prevention program can be a challenging and confusing job, but it is not impossible. Hopefully, you now have a better understanding of the regulatory basis of a stormwater program, you know how to run a base-level program, and you have some of the information needed for the more technical aspects of the program.

What do we do now?

The next move is yours. Begin by checking the status of your base's program. Does your base have a permit? Has it applied for one? If you have a permit, are you complying with the conditions of the permit?

Next, make sure you have the information you need to run the program. Check the list of references and if you are missing information, then you need to order it. Your most cost-effective source of reference material is probably through PRO-ACT (See Section 5.1.1). Check to see if you are keeping the records required and if your files are up to date.

The contacts you are going to need to run this program need to be established. You will need contacts both on the base and outside. The base contacts will form your installation stormwater management team. The outside contacts will include your MAJCOM, REO, and AFCEE, and the regulators.

Once you have the information you need, the contacts established, and this guide available, you should be prepared to run your stormwater program. Remember, this is a self-implementing program. It will not be a success unless you make it happen.

7. REFERENCES

The following are references which may be helpful in developing and enhancing your SW program. Many of these are mentioned in the text; others are listed because they provide additional information that may be useful in implementing your program:

1. *Code of Federal Regulations Cross Reference List*, PRO-ACT.
2. *Correction: Final NPDES General Permits for Stormwater Discharges Associated with Industrial Activities*, Federal Register, Vol. 57, No. 175, Wednesday, 9 September 1992.
3. *The Environmental Compliance Assessment and Management Program (ECAMP) and The Environmental Assessment and Management (TEAM) Guide*, 1995
4. *Guidance on Evaluation, Resolution, and Documentation of Analytical Problems Associated with Compliance Monitoring, Engineering and Analysis Division*, EPA 821-B-93-001, USEPA, 1993.
5. *Guidelines Establishing Test Procedures of Analysis of Pollutants Under Clean Water Act*, 40 CFR 136, 1994.
6. *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: A User's Guide*, Office of Research and Development, EPA/600/R-92/238, USEPA, 1993.
7. *Medical Service Environmental Quality Programs*, AFI 48-119.
8. *Methods for Chemical Analysis of Water and Wastes*, Office of Research and Development, Environmental Monitoring and Support Laboratory, EPA 600/4-79-020, revised March 1983, USEPA, 1983.
9. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition*, Office of Research and Development, EPA/600-40-90-027, USEPA, 1991.
10. The NPDES Program, 40 CFR 122-124.
11. *NPDES Stormwater Sampling Guidance Document*, Office of Wastewater Enforcement and Compliance, EPA 833-B-92-001, USEPA, 1992.
12. *Standard Methods for Examination of Water and Wastewater*, 1995, 19th Ed., APHA, AWWA and WPCF eds., available from American Public Health Assoc., 1015 Fifteenth St., NW, Washington, DC 20005.

13. *Stormwater Management For Construction Activities: Developing Pollution Prevention Plans and Best Management Practices*, Office of Water, EPA 832-R-92-005, USEPA, 1992.
14. *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices*, Office of Water, EPA 832-R-92-006, USEPA, 1992
15. *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices, Summary Guidance*, Office of Water, EPA 833-R-92-002, USEPA, 1992.
16. Stormwater Permit Manual, Volumes 1 & 2, Thompson Publishing Group, Washington, DC, 1995.

Note: The above documents can be ordered from the following sources:

- 1 - 15: PRO-ACT
3207 North Road
Brooks AFB, TX 78235
DSN 240-4214
(800) 233-4356

U.S. Department of Commerce
Technology Administration
National Technical Information Service (NTIS)
Springfield, VA 22161
(800) 553-6847
- 16: Thompson Publishing Group
1725 K Street, N.W., Suite 200
Washington, DC 20006
(800) 879-3169

APPENDIX A - FEDERAL AND STATE STORMWATER PROGRAMS

(Notes are explained on the following page)

STATE	PERMITS				SWP ³			MONITORING		
State Permitting Authority	State Permitting Authority	No. of Permits	Give Permit Expiration Date	Fees	Special Req. SARA Title III WPC	P.E. Certificate Requirement	Submit SWP ³ to State	Monitoring Required	Submit Results to Regulators	Representative Discharge Allowed
EPA Baseline Permit	N/A	1	10/1/97	N	Y	Y(1)	N	Y Industry-Specific Risk Based	Y(2)	Y
Alabama	Y	21	Late 1997	Y	N	N	N*	Varies	Y	Y(3)
Alaska**	N	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
Arizona**	N	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
Arkansas	Y	1	9/30/97	Y	Y*	Y*	N*	Y	Y*	Y*
California	Y	1	1/15/97	Y	N	N	N	Y	Y	Y
Colorado	Y	5	6/30/96	Y	Y*	N	Y(4)	Y*(4)	Y	Y
Connecticut	Y	1	10/1/97*	Y	N	Y	N*	Y(5)	N(6)	Y(7)
Delaware	Y	1	8/6/98	Y	Y	N	N	Y(1)	N	Y*
Florida**	Y	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
Georgia	Y	1	5/31/98	N	N	N	N	Y	N	Y*
Hawaii	Y	1	10/29/97	Y	Y*	Y	Y	Y	Y	Y
Idaho**	N	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
Illinois	Y	1	10/1/97*	N	N	N	Y(8)	N	N	N
Indiana	Y	By Rule	none	Y	N	N	N	Y(5)	Y	Y
Iowa	Y	1	10/1/97*	Y	Y*	N	N*	Y*	Y(9)	Y*
Kansas	Y	Draft								
Kentucky	Y	8	10/1/97*	N	N	N	N*	Y(5)	N	Y
Louisiana	N	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
Maine**	N	1	10/1/97*	N	Y*	Y*	N*	Y	N	Y
Maryland	Y	1	9/28/97	Y	Y	N	N*	N	N	N
Massachusetts**	N	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
Michigan	Y	1	1/31/99	Y	N	N	Y	N	N	N
Minnesota	Y	1	9/30/97	Y	N	N	N	N	N	N
Mississippi	Y	8	7/13/97	N	Y	N	Y	Y(10)	Y	Y
Missouri	Y	many	varies	Y	varies	varies	varies	varies	varies	varies
Montana	Y	2	11/30/94	Y	N	N	Y	Y(5)	Y	Y
Nebraska	Y	1	varies	N	N	Y*	N	Y	Y	N
Nevada	Y	2	5/14/98	Y	N	N	Y	Y(15)	Y(15)	N
New Hampshire**	N	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
New Jersey	Y	1	11/1/97	Y	N	N	N*	N	N	N
New Mexico**	N	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
New York	Y	1	8/1/98	Y	Y(14)	Y*	N*	Y	Y	Y*
North Carolina	Y	12	8/31/93	Y	Y(12)	N	N*(13)	Y(14)	Y	Y(13)

STATE	PERMITS				SWP ³			MONITORING		
State Permitting Authority	State Permitting Authority	No. of Permits	Give Permit Expiration Date	Fees	Special Req. SARA Title III WPC	P.E. Certificate Requirement	Submit SWP ³ to State	Monitoring Required	Submit Results to Regulators	Representative Discharge Allowed
North Dakota	Y	2	3/31/95	N	Y*	Y*	Y(5)	Y	Y	Y(7)
Ohio	Y	1	4/26/94	Y	Y*	Y*	N*	Y*	Y*	Y*
Oklahoma**	Y	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
Oregon	Y	12	9/30/96	Y	N	Y	N	Y(5)	Y	Y
Pennsylvania	Y	1	11/6/97	Y	Y	Y	N	Y	Y	Y*
Rhode Island	Y	1		Y	Y*	Y*	N*	Y*	Y*	Y*
South Carolina	Y	1	9/30/97	N	Y*	Y*	N*	Y*	Y*	Y*
South Dakota	Y	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
Tennessee	Y	1	10/26/97	N	Y*	Y*	N*	Y	Y	Y
Texas**	N	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
Utah	Y	1	9/30/97	Y	Y*	Y*	N*	Y*	Y*(2)	Y*
Vermont	Y	1	10/1/97*	N	Y*	Y*	N*	Y*	Y*	Y*
Virginia	Y	Emergency Permits								
Washington	Y	1	11/18/95	Y	N	N	N*	N	N	N
West Virginia	Y	1	6/7/97	Y	Y*	Y*	N	Y	Y	Y(13)
Wisconsin	Y	3	6/30/99	Y	N	N	Y	Y	Y	Y
Wyoming	Y	1	8/31/97	N	N	N	N	N	N	N

Notes:

SWP³ stormwater pollution prevention plan
SARA Superfund Amendments and Reauthorization Act
WPC water priority chemicals
* Same as EPA Requirements
** EPA state
PE Professional Engineer
(1) For facilities with SARA Title III water priority chemicals
(2) only for semiannual monitoring requirements
(3) request-by-request basis
(4) heavy industry only
(5) all permittees

(6) unless acute toxicity exceeds minimum
(7) subject to 20% rules
(8) annual reports submitted, not SWP3
(9) only those subject to effluent limitations
(10) SARA Title III, coal piles, wood treaters
(11) anticipated later
(12) semiannual inspections required
(13) upon request and approval
(14) compliance deadline for additional plan requirements was 1 November 1995
(15) facilities with current effluent limitations under 40 CFR Subchapter N only

This chart was revised in January 1997, and is believed to be correct. However, AFCEE and its contractors assume no liability for its accuracy.

APPENDIX B - ENVIRONMENTAL LAWS AND REGULATIONS

Federal Environmental Program	U.S. Code Reference	Code of Federal Regulations Reference
National Environmental Policy Act (NEPA)	42 USC 4321 et seq.	40 CFR 6, 1500-1508
Federal Water Pollution Control Act (Clean Water Act [CWA])	33 USC 1251	40 CFR 122, 125, 231
Safe Drinking Water Act (SDWA)	42 USC 300f et seq.	40 CFR 130, 141-143
Resource Conservation and Recovery Act of 1976 (RCRA)	42 USC 6901 et seq.	40 CFR 240-268
Clean Air Act (CAA)	42 USC 7401 et seq.	40 CFR 50-53, 56, 58, 60- 62, 65, 69, 87
Oil Pollution Act of 1990 (OPA 90)	33 USC 2701 et seq.	40 CFR 110, 112
Federal Facility Compliance Act (FFCA)	42 USC 6901 note, 6908	
Toxic Substances Control Act (TSCA)	15 USC 2601 et seq.	40 CFR 760-761
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)	7 USC 136 et seq.	40 CFR 150-186
Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) Compliance Program/Toxic Release Inventory (TRI) Reporting	42 USC 11001 et seq.	40 CFR 370, 372
Comprehensive Environmental Response, Compensation, Liability Act of 1980 (CERCLA)/Installation Restoration Program (IRP)	42 USC 9601 et seq.	40 CFR 302, 355, 373

APPENDIX C - REGULATORY AGENCY CONTACTS

STATE	FEDERAL FACILITIES AUTHORITY	POINTS OF CONTACT	TELEPHONE
Alabama	Alabama	Lee Warner Department of Environmental Management Water Quality Division, Industrial Board 1751 Congressman Dickinson Dr. Montgomery, AL 36130	(334) 271-7847
Alaska	EPA Region 10 - WA	Joe Wallace US EPA, Region 10 1200 Sixth Ave. Mailcode: WD-1234 Seattle, WA 98101	(206) 553-8399
	Alaska	Ted Rockwell US EPA Alaska Operations Office 222 West 7th Ave., No.19 Anchorage, AK 99513-7588	(907) 271-3689
Arizona	EPA Region 9 - CA	Eugene Bromley US EPA, Region 9 75 Hawthorne St. Mailcode: W-5-1 San Francisco, CA 94105	(415) 744-1906
		Robert Wilson State Stormwater Coordinator Department of Environmental Quality Surface Water Quality Section Engineering Review and Permits Unit 3033 North Central Ave. Phoenix, AZ 85012	(602) 207-4574
Arkansas	Arkansas	Steve Patrick Department of Pollution Control and Ecology Water Division 8001 National Dr. P.O. Box 8913 Little Rock, AR 72219-8913	(501) 562-7444
California	California	Bruce Fujimoto or Leo Cosentini State Water Resources Control Board Water Quality Division P.O. Box 100 901 P St. Sacramento, CA 95801	(916) 657-1011 Stormwater Information Hotline (916) 657-1110 Bulletin Board (916) 654-3692
Colorado	Colorado	Cathy Dolan Colorado Department of Health WQCD-PE-B2 4300 Cherry Creek Dr. South Denver, CO 80222-1530	(303) 692-5396

STATE	FEDERAL FACILITIES AUTHORITY	POINTS OF CONTACT	TELEPHONE
Connecticut	Connecticut	Chris Stone Department of Environmental Management Water Management Bureau 79 Elm St. Hartford, CT 06106-5127	(860) 424-3850
Delaware	Delaware	Chuck Schadel Department of Natural Resources and Environmental Control Division of Water Resources Pollution Control Branch, NPDES Stormwater Program 89 Kings Highway P.O. Box 1401 Dover, DE 19903	(302) 739-5731
District of Columbia	EPA Region 3 - PA	Leo Essenthier US EPA, Region 3 841 Chestnut Building Mailcode: 3WM53 Philadelphia, PA 19107	(215) 597-1651
Florida	EPA Region 4 - GA Florida	Gina Fonzi US EPA, Region 4 345 Courtland St. N.E. Mailcode: 4WM-WPEB Atlanta, GA 30365 Eric H. Livingston Department of Environmental Regulation Stormwater/Nonpoint Source Management Section Twin Towers Office Building 2600 Blair Stone Road Tallahassee, FL 32399-2400	(404) 562-9301 (904) 921-9915
Georgia	Georgia	Will Salter Department of Natural Resources Environmental Protection Division 205 Butler St. S.E. Atlanta, GA 30334	Industrial Wastewater Program (404) 656-4887 Municipal Permitting Program (404) 362-2680
Hawaii	Hawaii	Alec Wong Department of Health Clean Water Branch P.O. Box 3378 Honolulu, HI 96801	(808) 586-4309

STATE	FEDERAL FACILITIES AUTHORITY	POINTS OF CONTACT	TELEPHONE
Idaho	EPA Region 10 - WA	Joe Wallace US EPA, Region 10 1200 Sixth Ave. Mailcode: WD-1234 Seattle, WA 98101	(206) 553-8399
	Idaho	Mike Allen US EPA 1435 N. Orchard Boise, ID 83706	(208) 334-9489
Illinois	Illinois	Ginger Wells Environmental Protection Agency Water Pollution Control Division 2200 Churchill Road P.O. Box 19276 Springfield, IL 62794-9276	(217) 782-0610
Indiana	Indiana	Laura Bieberich Gretchen Miller Department of Environmental Management Office of Water Management NPDES Permits Group 100 N. Senate Ave. P.O. Box 6015 Indianapolis, IN 46206	(317) 233-6725 (317) 233-0468
Iowa	Iowa	Monica Wnuk Department of Natural Resources Water Quality Bureau Wallace State Office Building 900 E. Grand Ave. Des Moines, IA 50319-0034	(515) 281-7017
Kansas	Kansas	David G. Freise Scott Shield Iona Stickle Department of Health and Environment Bureau of Water Building 283, Forbes Field Topeka, KS 66620-0001	(913) 296-8645 (913) 296-8645 (913) 296-5509
Kentucky	Kentucky	Doug Allgeier Industrial Section KPDES Branch, Division of Water Department of Environmental Protection 14 Reilly Road Frankfort, KY 40601	(502) 564-2225, ext. 448

STATE	FEDERAL FACILITIES AUTHORITY	POINTS OF CONTACT	TELEPHONE
New York	New York	Ken Stevens Robin Warrender (nonpoint source pollution) Bill Morton Department of Environmental Conservation Division of Water 50 Wolf Road Albany, NY 12233	(518) 457-3656 (518) 457-6781 (518) 547-3656
North Carolina	North Carolina	Bill Mills, Steve Ulmer, or Liz Kovasckitz Department of Environment, Health, and Natural Resources Division of Environmental Management Water Quality Planning Section P.O. Box 29535 Raleigh, NC 27626-0535	(919) 733-5083
North Dakota	North Dakota	Jim Collins Rand Kowolski (mining activities) North Dakota Department of Health Water Quality Division 1200 Missouri Ave. P.O. Box 5520 Bismark, ND 58502-5520	(701) 328-5242 (701) 328-5244
Ohio	Ohio	Bob Phelps Environmental Protection Agency Division of Surface Water P.O. Box 163669 1800 Watermark Dr. Columbus, OH 43266-3660	(614) 664-2001 Stormwater Hotline (614) 644-2053
Oklahoma	EPA Region 6 - TX Oklahoma	Brent Larsen US EPA, Region 6 1445 Ross Ave. Mailcode: 6W-PM Dallas, TX 75202 Ted Williamson Dave Farrington Brooks Kirlin (Customer Assistance Program) Department of Environmental Quality Water Quality Division 1000 N.E. 10th Street Oklahoma City, OK 73117-1212	(214) 665-7523 Region 6 Stormwater Hotline (214) 665-7185 (405) 271-5205 ext. 120 (405) 271-7440 ext. 120 (405) 271-1400
Oregon	Oregon	Andy Schaedel Department of Environmental Quality Water Quality Division 811 S.W. Sixth Ave. Portland, OR 97204	(503) 229-6121

STATE	FEDERAL FACILITIES AUTHORITY	POINTS OF CONTACT	TELEPHONE
Pennsylvania	Pennsylvania	Cuong Vu Department of Environmental Resources Water Quality Management Bureau Division of Permits and Compliance MSSPB-10th Floor P.O. Box 8465 Harrisburg, PA 17105-8465	(717) 787-8184
	Pennsylvania	Mike Sherman Bureau of Land and Water Conservation Division of Stormwater Management and Sediment Control P.O. Box 8555 Harrisburg, PA 17105-8555	(717) 783-7577
	EPA Region 3 - PA	Leo Essentier US EPA, Region 3 841 Chestnut Bldg Mailcode: 3WM53 Philadelphia, PA 19107	(215) 597-1651
Rhode Island	Rhode Island	Kin Wiegand or Angelo Liberti Department of Environmental Management Division of Water Resources 291 Promenade St. Providence RI 02908	(401) 277-6519 Ext 7233
South Carolina	South Carolina	Arturo Ovalles, Stormwater Chief Harvey Daniel Bureau of Water Pollution Control Department of Health and Environmental Control 2600 Bull St. Columbia, SC 29201	(803) 734-5300
South Dakota	South Dakota	Norma Job Department of Environmental Regulation Joe Foss Building 523 East Capitol Pierre, SD 57501-3181	(605) 773-3546 Stormwater Information 1-800-SDS-STORM or (605) 773-3351
Tennessee	Tennessee	Robert Haley Department of Environment and Conservation Division of Water Pollution Control L&C Annex, 6th Floor 401 Church St. Nashville, TN 37243-1534	(615) 532-0669

STATE	FEDERAL FACILITIES AUTHORITY	POINTS OF CONTACT	TELEPHONE
Texas	EPA Region 6 - TX Texas	Brent Larsen Monica Burrell US EPA, Region 6 1445 Ross Ave. Mailcode: 6W-PM Dallas, TX 75202 Stephen Ligan State Water Quality Permits Texas Natural Resources Conservation Commission Stephen F. Austin Bldg. 1700 North Congress Ave. Box 13087 Austin, TX 78711-3087	(214) 665-7523 (214) 655-7530 Region 6 Stormwater Hotline (214) 665-7185 (512) 463-8212
Utah	Utah	Harry Campbell (industrial discharges) Mark Schmitz (municipal discharges) Department of Environmental Quality Division of Water Quality Salt Lake City, UT 84114-4870	(801) 538-6146
Vermont	Vermont	Brian Kooiker Department of Environmental Conservation Permits, Compliance, and Protection Division 103 S. Main St. Waterbury, VT 05676	(802) 241-3822
Virginia	Virginia	Burton Tuxford Virginia Department of Environmental Quality Water Division P.O. Box 11143 Richmond, VA 23230-1143	(804) 527-5083
Washington	Washington	Peter Birch, Stormwater Supervisor Stan Ciuba (industrial permits) Linda Matlock (industrial permits) Ed O'Brien (municipal permits) Alan Wessel (municipal permits) Department of Ecology Office of Water Programs Water Quality Program P.O. Box 47696 Olympia, WA 98504-7696	(206) 407-6458 (206) 407-6435 (206) 407-6437 (206) 407-6438 (206) 407-6457
West Virginia	West Virginia	Jim Mason Lyle Bennett (nonpoint source selection) Leroy Gilbert Department of Commerce, Labor, and Natural Resources Office of Water Resources Industrial Branch 1201 Greenbrier St. Charleston, WV 25311	(304) 558-8855 (304) 558-2108 (304) 256-6850

STATE	FEDERAL FACILITIES AUTHORITY	POINTS OF CONTACT	TELEPHONE
Wisconsin	Wisconsin	Gary Bartz Dan Houston Jim Bertolacini Dan Graff Department of Natural Resources Bureau of Wastewater Management P.O. Box 7921 Madison, WI 53707-7921	(608) 267-7634 (608) 267-7621 (608) 266-7078 (608) 264-3527
Wyoming	Wyoming	Leah Krafft Department of Environmental Quality Herschler Building, 4th Floor Cheyenne, WY 82002	(307) 777-7093
American Samoa	US EPA, Region 9	Eugene Bromley US EPA, Region 9 75 Hawthorne St. Mailcode: W-5-1 San Francisco, CA 94105	(415) 744-1906
Guam	US EPA, Region 9	Eugene Bromley US EPA, Region 9 75 Hawthorne St. Mailcode: W-5-1 San Francisco, CA 94105	(415) 744-1906
Northern Mariana Islands	US EPA, Region 9	Eugene Bromley US EPA, Region 9 75 Hawthorne St. Mailcode: W-5-1 San Francisco, CA 94105	(415) 744-1906
Puerto Rico	US EPA, Region 2	Sergio Bosques US EPA, Region 2 26 Federal Plaza Mailcode: WMD-WPCB New York, NY 10278 Thomas Rivera Director of Water Quality Area Environmental Quality Board P.O. Box 11488 Santruce, Puerto Rico 00910	(212) 637-3717 (809) 767-8181

STATE	FEDERAL FACILITIES AUTHORITY	POINTS OF CONTACT	TELEPHONE
Virgin Islands	Virgin Islands	<p>Jim Miller Ann Hanley Department of Planning and Natural Resources Environmental Protection Division Government House Charlotte Amalie St. Thomas, Virgin Islands 00801</p> <p>George Suarez Director, Coastal Zone Management Office Department of Planning and Natural Resources 6003 Annas Hope Christiansted St. Croix, Virgin Islands 00820-4433</p>	<p>(809) 773-0565</p> <p>(809) 774-3320</p>

APPENDIX D - AIR FORCE POCs

NAME	ADDRESS	PHONE/E-MAIL
Tom Moreland	HQ AFCEE/EP 3207 North Road Brooks AFB, TX 78235-5363	(210) 536-5303 240-5303 (DSN) (210) 536-4254 (FAX) tmorelann@afceeb1.brooks.af.mil
Jay Shah	HQ USAF/CEVC 1260 Air Force Pentagon Pentagon, Washington, DC 20330-1260	(703) 697-3360 227-3360/3361 (DSN) (703) 697-3378 (FAX) shahj@afcee.hq.af.mil
Jim Lafrenz	HQ AFCESA/CES 139 Barnes Drive Tyndall AFB, FL 32403-5319	(904) 283-6332 523-6332 (DSN) (904) 283-6185 (FAX) lafrenzj@afcesa.af.mil
Vic Verma	HQ AFCEE/CCR-A 77 Forsyth St, SW, Suite 295 Atlanta, GA 30335-6804	(404) 331-0590 (404) 331-2537 (FAX) vverma@afceeb1.brooks.af.mil
Johnny Combs	HQ AFCEE/CCR-D 525 Griffin, Suite 505 Dallas, TX 75202	(214) 767-4671 (214) 767-4661 (FAX) jcombs@afceeb1.brooks.af.mil
Charles Lee	HQ AFCEE/CCR-S 630 Sansome St, Suite 1334 San Francisco, CA 94111-2278	(415) 977-8890 (415) 977-8900 (FAX) clee@afceeb1.brooks.af.mil
Gary Nault	HQ ACC/CES/ESC 129 Andrews St, Suite 102 Langley AFB, VA 23665-2769	(804) 764-3664 (804) 764-5339 (FAX) hqacce.langley
Hes Sangavi	HQ AMC/CEVC 507 A St Scott AFB, IL 62225-5022	(618) 256-5764 (618) 256-3753 (FAX) sanghavih@mhs.safb
Dennis Kirsch	HQ AETC/CEVP 266 F St West Randolph AFB, TX 78150-4321	(210) 652-3240 (210) 652-3597 (FAX) kirschd@hqce.aetc.af.mil
Teresa Finke	HQ AFMC/CEVV 4225 Logistics Ave, Suite 8 Wright-Patterson AFB, OH 45433-5747	(513) 257-5878 (513) 257-5875 (FAX) finket@afmcece.wpafb
Mike Applegate	HQ AFSOC/CEV 100 Bartley St, Suite 218E Hurlburt Field, FL 32544-5273	(904) 884-2260 (904) 884-5982 (FAX) cemapple@hqafsoc
Bill Siegele	HQ AFSPC/CEVV 150 Vandenberg St, Suite 1105 Peterson AFB, CO 80914-4150	(719) 554-6406 (719) 554-3849 (FAX) bsiegele@spacecom.af.mil
Phil Volytle	HQ USAFA/CEV 8120 Edgerton Dr, Suite 40 USAF Academy, CO 80840-2400	(719) 333-4483 (719) 333-3753 (FAX) volytlepj.ce@usafa.af.mil
Mano Husain	HQ PACAF/CEVV 25 E St, Suite D305 Hickam AFB, HI 96853	(808) 448-0474 (808) 449-0427 (FAX) hussein@hqpacaf
Stephanie Binggeli	HQ USAFE/CEVC Unit 3050, Box 10 APO AE, 09094	DSN 480-6383-682/6482 binggels@hsafe22ramstein.af.mil

NAME	ADDRESS	PHONE/E-MAIL
Sue Stell	HQ AFRES/CEVV 155 Second St Robins AFB, GA 31098-1635	(912) 327-1078 (912) 327-0108 (FAX) sstell@wrb.afres
Kathy Makofski	ANGRC/CEVC 3500 Fetchet Ave Andrews AFB, MD 20331-6008	(301) 836-8695 (301) 836-8151 (FAX) kmakofski@angrc.ang
John Smith	HQ AFBCA/EV 1700 North Moore St/Suite 2300 Arlington, VA 22209	(703) 696-5534/35 (703) 696-8828/33 (FAX) jsmith@afba1.hq.af.mil

APPENDIX E - SAMPLE DELEGATION LETTER

Date

Director
Water Management Division
Regulatory Authority
Anytown, USA 00000

Dear Sir/Madam:

I am the Commanding Officer with responsibility for overall operations at XYZ Air Force Base. Under the provisions of 40 CFR 122.22 and 123.25 (or state equivalent), I hereby delegate authority to persons in the following named positions as my duly authorized representatives. (Select from the following list, or modify, as appropriate.)

1. Base Civil Engineer
2. Chief, Environmental Flight (CEV)

They will act on my behalf on matters concerning the NPDES stormwater program.

Sincerely,

Commander
XYZ Air Force Base

APPENDIX F - BEST MANAGEMENT PRACTICES (BMPs)

This section contains BMPs for typical Air Force industrial operations. These BMPs are intended to provide the installation a starting point for beginning stormwater inspections. These BMPs should be modified as necessary to make them site specific. The following BMPs are included:

- BMPs for Fueling Operations
- BMPs for Vehicle and Equipment Maintenance
- BMPs for Painting Operations
- BMPs for Vehicle and Equipment Washing
- BMPs for Loading and Unloading Materials
- BMPs for Aircraft and Airfield Deicing/Anti-icing Operations

BMPs For Fueling Operations

When stormwater 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 questions will help identify activities on the installation that can contaminate stormwater and suggest BMPs to reduce or eliminate stormwater contamination from fueling operations. This BMP applies to any installation that conducts outdoor fueling or if fueling occurs in areas where leaks or spills could contaminate stormwater.

Q. Have you installed spill and overfill prevention equipment?

Fuel overflows during storage tank filling are a major source of spills. Overflows can be prevented. Watch the transfer constantly to prevent overfilling and spilling. 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. State or local regulations may be stricter, so contact the state and/or local government for details. Consider installing overflow prevention equipment sooner than the required deadline as part of the pollution prevention plan.

Fuel Station Activities That Can Contaminate Stormwater
<ul style="list-style-type: none"> • Spills and leaks that happen during fuel or oil delivery • Spills caused by “topping off” fuel tanks • Allowing rainfall on the fuel area or stormwater to run onto the fuel area • Hosing or washing down the fuel area • Leaking storage tanks

Q. Are vehicle fuel tanks often “topped off”?

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 overflowing the tank and spilling fuel. Discourage topping off by training employees and posting signs.

Q. Have you taken steps to protect fueling areas from rain?

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. Over time, the asphalt itself can become a source of stormwater pollution.

Q. Is run-on to the fueling area minimized?

Run-on is stormwater generated from other areas that flows or “runs on” to base property. 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 stormwater around fueling area.

Q. Are oil/water separators or oil and grease traps installed in storm drains in the fueling area?

Oil/water separators and oil and grease traps are devices that reduce the amount of oil entering storm drains. These devices should be installed and routinely inspected, cleaned, and maintained.

Q. Is the fueling area cleaned by hosing or washing?

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

Q. Do you control petroleum spills?

Spills should be controlled immediately. Small spills can be contained using sorbent material such as kitty litter, straw, or sawdust. Do not wash petroleum spills into the storm drain or sanitary sewer.

Employee Involvement is the Key
Getting employees interested in reducing waste generation is the key to a successful stormwater pollution prevention plan. Discuss P ² with your employees. They are most familiar with the operations that generate wastes and may have helpful waste reduction suggestions.

Q. Are employees aware of ways to reduce contamination of stormwater at fueling stations?

Stormwater contamination from fueling operations often occurs from small actions such as topping off fuel tanks, dripping engine fluids, and hosing down fuel areas. Inform employees about ways to eliminate or reduce stormwater contamination.

Q. Where does the water drain from the fueling area.

In many cases, wash water and stormwater 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. Some states require that these discharges be tied into a sanitary sewer or process wastewater treatment system. If discharges from fueling or other high risk areas at your facility drain to a sanitary sewer system, you should inform your local POTW.

Summary of Fueling Station BMPs
<ul style="list-style-type: none">• Consider installing spill and overflow protection.• Discourage topping off fuel tanks.• Reduce exposure of the fuel area to stormwater.• Use dry cleanup methods for the fuel area.• Use proper petroleum spill control.• Encourage employee participation.

BMPs for Vehicle and Equipment Maintenance

Many vehicle and equipment maintenance operations use materials or create wastes that are harmful to humans and the environment. Stormwater 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 and greases, acids, and caustic wastes. These and other harmful substances in stormwater can enter water bodies through storm drains or through small streams where they can harm fish and wildlife.

The following questions will help you find sources of stormwater contamination from vehicle and equipment maintenance operations on your site and to help choose BMPs that can reduce or eliminate those sources.

Q. Are parts cleaned at the facility?

Parts are often cleaned using solvents such as trichloroethylene, 1,1,1-trichloroethane, or methylene chloride. Many of these cleaners 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. Do all liquid cleaning at a centralized station so the solvents and residues stay in one area. If you dip parts 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.

Q. Have you looked into using nontoxic or less toxic cleaners or solvents?

If possible, eliminate or reduce the number or amount of hazardous materials and waste by substituting nonhazardous or less hazardous materials. For example:

- Use noncaustic detergents instead of caustic cleaning agents for parts cleaning
- Use detergent-based or water-based cleaning systems in place of organic solvent degreasers. Wash water may require treatment before it can be discharged to the sanitary sewer.
- Replace chlorinated organic solvents (1,1,1-trichloroethane, methylene chloride, etc.) with nonchlorinated solvents. Nonchlorinated 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.

Activities that can contaminate stormwater:
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Engine repair and service:

- | |
|---|
| <ul style="list-style-type: none"> • Parts cleaning • Shop cleanup • Spilled fuel, oil, or other materials • Replacement of fluids (oil, oil filters, hydraulic fluids, transmission fluid, and radiator fluid) |
|---|

Outdoor vehicle parking and equipment storage and parking:
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- | |
|---|
| <ul style="list-style-type: none"> • Dripping engine and automotive fluids from parked vehicles and equipment. |
|---|

Disposal of materials or process wastes:
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- | |
|---|
| <ul style="list-style-type: none"> • Greasy rags • Oil Filters • Air Filters • Batteries • Spent coolant, degreasers, etc. |
|---|

- Choose cleaning agents that can be recycled.

Q. Are work areas and spills washed or hosed down with water?

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

- Avoid hosing down your 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 you unclip hoses, unscrew filters, or remove other parts. Use a drip pan under any vehicle that might leak while you work on it to keep splatters or drips off the shop floor.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't 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.

Q. Are spills or materials washed or poured down the drain?

Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections. Used or leftover cleaning solutions, solvents, and automotive fluids and oils 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 you are unsure of how to dispose of chemical wastes, contact your Environmental Management Flight (EMF). Post signs at sinks to remind employees, and paint stencils at outdoor drains to tell customers and others not to pour wastes down drains.

Q. Are oil filters completely drained before recycling or disposal?

Oil filters disposed of in trash cans or dumpsters can leak oil and contaminate stormwater. 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 the EMF about recycling oil filters.

Q. Are incoming vehicles and equipment checked for leaking oil and fluids?

If possible, park vehicles indoors or under a roof so stormwater does not contact the area. If you park vehicles outdoors while they await 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 stormwater 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 or the sanitary sewer and drips and spills can be easily cleaned up.

Q. Are wrecked vehicles or damaged equipment stored outside?

Be especially careful with wrecked vehicles, whether you keep them indoors or out, as well as with vehicles kept on site 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 you believe that all fluids have leaked out before the car reaches your shop.

- Build a shed or temporary roof over areas where you park cars awaiting repairs or salvage, especially if you handle wrecked vehicles. Build a roof over vehicles you keep for parts.
- Drain all fluids, including air conditioner coolant, from wrecked vehicles and “parts” cars. Also drain engines, transmissions, and other used parts.
- Store cracked batteries in a nonleaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Battery Acid Spills
Handle spills from broken batteries with care. If you use baking soda to neutralize spilled acid during cleanup, remember that the residue is still dangerous to handle and must be disposed of as a hazardous waste because it may contain lead and other contaminants.

Q. Do you recycle any of these materials?

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

All of these materials can be either recycled at your facility or sent off site for recycling. Some recycling options, ranked by level of effort required, follow.

Least Effort
<ul style="list-style-type: none"> • Arrange for collection and transportation of car batteries, used oil and other fluids, cleaning solutions, and degreasers to a commercial recycling facility. This requires that you separate wastes and store them 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
<ul style="list-style-type: none"> • Used oil, antifreeze, and cleaning solutions can be recycled on site using a filtration system that removes impurities and allows the fluid to be reused. Filtration systems are commercially available.
Most Effort
<ul style="list-style-type: none"> • Install an on-site solvent recovery unit. If your facility creates large volumes of used solvents, you may consider purchasing or leasing an on-site still to recover the solvent for reuse.

Q. Can you reduce the number of different solvents used?

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

Employee involvement is the key

Getting employees interested in reducing waste generation is the key to a successful stormwater pollution prevention plan. Discuss pollution prevention with your employees. They are most familiar with the operations that generate wastes and may have helpful waste generation suggestions.

Q. Are wastes separated?

Separating wastes allows for easier recycling and may reduce treatment costs. Keep hazardous and nonhazardous wastes separate; do not mix used oil and solvents; and keep chlorinated solvents separate from nonchlorinated solvents. Proper labeling of all wastes and materials will help accomplish this goal.

Q. Do you use recycled products?

Many products made of recycled 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 nontoxic or low-toxicity materials.
 - Drain oil filters before disposal or recycling.
 - Don't pour liquid waste down drains.
 - Recycle engine fluids and batteries.
 - Segregate and label wastes.
 - Buy recycled products.

BMPs for Painting Operations

Many painting operations use materials or create wastes that are harmful to humans and the environment. Stormwater 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 stormwater can enter water bodies directly through storm drains where they can harm fish and wildlife.

The following questions will help you identify potential sources of stormwater contamination from painting operations on your site, and BMPs that can reduce or eliminate these sources. Reading this section can help you eliminate, reduce, or recycle pollutants that may otherwise contaminate stormwater.

Q. Is care taken to prevent paint wastes from contaminating stormwater 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 stormwater.

Painting activities that can contaminate stormwater
<ul style="list-style-type: none">• Painting and paint removal• Sanding or paint stripping• Spilled paint or paint thinner

Q. Are wastes from sanding contained?

Prevent paint chips from coming into contact with stormwater. Paint chips may contain hazardous metallic pigments or biocides. You can reduce contamination of stormwater 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 stormwater.
- Move the activity indoors if you can do it safely.

Q. Are parts inspected 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.

Q. Are you using 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 stormwater. 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

Q. Are employees trained to use spray equipment correctly?

Operator training can reduce overspray and minimize the amount of paint solids that can contaminate stormwater. 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.

Q. Do you recycle paint, paint thinner, or solvents?

These materials can either be recycled at the facility or sent off site for recycling. Some recycling options ranked by the level of effort required follow.

Least effort
<ul style="list-style-type: none"> • Dirty solvent can be reused for cleaning dirty spray equipment and parts before equipment is cleaned in fresh solvent.
Moderate effort
<ul style="list-style-type: none"> • Arrange for collection and transportation of paints, paint thinner, or spent solvents to a commercial recycling facility.
Most Effort
<ul style="list-style-type: none"> • Install an on site solvent recovery unit. If your facility creates large volumes of used solvents, paint, or paint thinner, you may consider buying or leasing an on site still to recover used solvent for reuse.

Q. Are wastes separated?

Separating wastes makes recycling easier and may reduce treatment costs. Keep hazardous and nonhazardous wastes separate, and keep chlorinated solvents separate from nonchlorinated solvents. Check the materials data sheet for ingredients, or contact the Environmental Management Flight or Environmental Management Directorate to learn which waste types can be stored together and which should be separated.

Q. Can you reduce the number of solvents you use?

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

Q. Do you use recycled products?

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

Summary of Painting Operation BMPs
<ul style="list-style-type: none">• Inspect parts prior to painting.• Contain sanding wastes.• Prevent paint waste from contacting stormwater.• Proper interim storage of waste paint, solvents, etc.• Evaluate efficiency of equipment.• Recycle paint, paint thinner, and solvents.• Segregate wastes.• Buy recycled products.

BMPs for Vehicle and Equipment Washing

Washing vehicles and equipment outdoors or in areas where wash water flows onto the ground can pollute stormwater. Wash water can contain high concentrations of oil and grease, phosphates, and high suspended solid loads (these and other potentially harmful substances can pollute stormwater 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 NPDES permit. Contact your Environmental Management Flight about the specifics of wastewater regulation.

The following questions are designed to help you find sources of stormwater contamination from vehicle and equipment washing and to select BMPs to reduce those sources. Reading this section can help you eliminate, reduce, or recycle pollutants that may contaminate stormwater.

Q. Have you considered using phosphate-free biodegradable detergents?

Phosphates, which are plant nutrients, can cause excessive growth of nuisance plants in water when they enter lakes and streams in wash water. Some states ban the use of detergents containing high amounts of phosphates.

Vehicle and equipment washing activities that can contaminate stormwater
<ul style="list-style-type: none"> • Outside equipment or vehicle cleaning (washing or steam cleaning). • Wash water discharged directly to the ground or stormwater drain.

Q. Are vehicles, equipment, or parts 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 stormdrains when it rains. Washing over pervious ground such as sandy 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.

Employee involvement is the key
Getting employees interested in reducing waste is the key to a successful stormwater pollution prevention plan. Discuss pollution prevention with your employees. They are most familiar with the operations that generate wastes and may have helpful waste generation suggestions.

If you are washing large equipment or vehicles, and have 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. Contact the Environmental Management Flight for specific discharge instructions.

Summary of Vehicle and Equipment Washing BMPs
<ul style="list-style-type: none"> • Consider use of phosphate-free detergents. • Use designated cleaning areas. • Consider recycling wash water.

BMPs for Loading and Unloading Materials

Loading/unloading operations usually take place outside on docks and 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 questions are designed to help you find sources of stormwater contamination from loading and unloading materials and choose BMPs to reduce or eliminate those sources. Reading this section can start you on the road to eliminating, reducing, or recycling pollutants that otherwise may contaminate stormwater.

Q. Are tank trucks and material delivery vehicles located where spills or leaks can be contained?

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

Q. Is loading/unloading equipment 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 loading/unloading operations.

Q. Are loading/unloading docks or areas 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.

Q. Are loading/unloading areas designed to prevent stormwater run-on?

Run-on is stormwater created from other areas that flows or “runs on” to your 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,
- Positioning roof down spouts so stormwater is directed away from loading sites and equipment and preferably to a grassy or vegetated area where the stormwater can soak into the ground.

Loading and unloading activities that can contaminate stormwater:

- 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.

Summary of loading/unloading operations BMPs

- | |
|--|
| <ul style="list-style-type: none">• Contain leaks during transfer.• Check equipment regularly for leaks.• Limit exposure of material to rainfall.• Prevent stormwater run-on. |
|--|

BMPs for Aircraft and Airfield Deicing/Anti-icing Operations

HQ USAF/CEVQ provided "Interim Guidance on Pollution Prevention Best Management Practices for Deicing/Anti-icing Operations on 5 December 1996. This guidance provides information for installations that can help reduce deicer/anti-icer runoffs into nearby waterways and conduct operations that comply with the Clean Water Act while minimizing the impact to flying operations. Over the next few months, the AF will focus on finalizing environmental and operational requirements for northern tier base and plan to issue implementation guidance by the summer of 1997. Until that time, please use the following BMPs. Any questions may be directed to your MAJCOM/LG or aircraft Single Manager.

Mission Scheduling/Prioritization

Expected Outcome: Reduces number of aircraft exposed to icing conditions requiring deicing/anti-icing.

What it is:

- Evaluate the necessity of generating and executing each sortie during icing events, considering the impact of a mission cancellation or delay on combat readiness, aircrew currency, customer requirements, environmental pollution, and safety.
- Closely monitor developing weather systems, and (1) consider delaying routine training or (2) preposition aircraft at another base until clear of freezing conditions.
- During winter months, evaluate feasibility of routinely scheduling training sorties after morning, freezing conditions have passed.

Aircraft Parking Techniques

Expected outcome: Reduces number of aircraft exposed to icing conditions requiring deicing.

What they are:

- Review weather patterns to identify when icing conditions are likely.
- Perform scheduled aircraft maintenance during nonicing time periods or perform scheduled maintenance in southern tier bases to free up hanger space.
- Put scheduled aircraft in hangars to prevent icing or allow for thermal deicing.
- When feasible, orient aircraft to take advantage of natural melting from the sun and minimize engine icing due to winds.

Things to consider:

- Develop a full understanding of scheduled maintenance requirements and their impacts on aircraft before implementing BMPs.

- Determine critical icing parameters and thresholds, and provide airframe dependent values of frost formation. Document them and other requirements for weather support in base weather support plan.
- Work closely with base weather office to obtain forecasts of icing/frost on parked aircraft.

Mechanical Aircraft Ice and Snow Removal

Expected outcome: Reduces use of deicing chemicals by removing accumulation of ice or snow and the volume of waste deicers requiring capture, containment, recycling, and disposal.

What it is:

- Use brooms, ropes, squeegees to remove snow prior to deicing.
- Use forced air blasters approved by the Single Manager of these systems (SA-ALC/LDEE) to remove snow accumulation prior to deicing.
- Remove all snow surrounding and under the aircraft prior to deicing.

Things to consider:

- **WARNING:** Aircraft Technical Order (TO) may not permit use of any or all of these mechanical techniques. Consult with the TO or the aircraft Single Manager before attempting to implement these techniques.
- **WARNING:** Hot water deicing is not authorized per TO 42C-1-2.

Contain Deicers Prior to Reaching Waterways

Expected outcome: Prevents deicing runoffs into the waters of the U.S.

What they are:

- Use spill prevention measures to contain release of deicers to waterways.
- Evaluate gradient of aircraft pavements and determine drainage patterns. If feasible, deice aircraft adjacent to areas where runoffs can be captured/contained.

Things to consider:

- **WARNING:** Stormwater permits do not authorize dry weather discharges of chemical deicers to the waters of the U.S. You must prevent deicer runoffs during dry weather (no precipitation) conditions.
- Routine use of deicers does not constitute a hazardous material spill, therefore, an SPCC (emergency) response is not required.

- Some states require zero discharge of glycols, therefore, these BMPs may be a regulatory compliance action at certain bases.

Aircraft Anti-icing

Expected outcome: Reduces the need to deice, a process that typically requires more fluids than anti-icing, resulting in a reduction of deicer runoff.

What it is:

- Work with base weather office to determine when icing conditions for specific aircraft are likely.
- Apply commercial Type 2 anti-icers just before icing conditions begin.

Things to consider:

- **WARNING:** Use of commercial Type 2 anti-icers requires approval of general or specific aircraft deicing/anti-icing TO, specialized equipment, and training. Consult with the aircraft Single Manager before using commercial Type 2 anti-icers.
- Use forced air blasters approved by the Single Manager of these systems to remove snow that has accumulated on anti-iced surface, reapply Type 2 fluids.
- Use “hold-over” timetables to estimate total time anti-icing fluids will be effective.
- Recommend you do not mix deicing/anti-icing fluids from different manufacturers before Wright Laboratory performs additional qualification testing.
- Capture, contain, recycle, and dispose of waste anti-icers to prevent runoffs.

Aircraft Washracks

Expected outcome: Reduces time consuming process of containing and capturing chemicals that have fallen on airfield pavement.

What it is:

- Deice/anti-ice on existing aircraft washrack that is connected to a sanitary sewer system.

Things to consider:

- The off-base Publicly-Owned Treatment Works or base treatment plant may not have the capacity to accept these chemicals. Obtain their agreement in writing before using washracks for deicing/anti-icing.
- If an agreement is not possible, block washrack drains leaving the collection tank and collect, recycle or dispose of chemicals in the tank. Remember to empty collection tanks frequently to prevent overflow of deicers.

- **WARNING:** Use only washracks that are connected to sanitary sewer systems.

APPENDIX G - PRO-ACT FACT SHEETS

The Fact Sheets covering Stormwater Pollution Prevention and Deicing Chemicals are available in hard copy only. These Fact Sheets may be obtained by contacting PRO-ACT at DSN 240-4214.

APPENDIX H - EPA MULTISECTOR PERMIT FACT SHEET

This is a summary of new provisions of the EPA NPDES Multisector General Permit for Stormwater Discharges associated with industrial activity and comparison with the Baseline General Permit for Stormwater Discharges. Mr. Dennis W. Kirsch from HQ AETC/CEVC provided this summary.

Summary of Key Provisions of the new EPA NPDES Multisector General Permit for Stormwater Discharges Associated with Industrial Activity and Comparison with Baseline General Permit for Stormwater Discharges

By: Dennis W. Kirsch, HQ AETC/CEVQ

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Source: 60 FR 50804 et seq., 29 September 1995 (Multisector General Permit) 57 FR 41236 et seq., 9 September 1992 (Baseline General Permit)

1. Coverage

a. Multisector General Permit (MSGP)

The permit covers 29 industrial sectors (A-AC) in those states in which the EPA has regulatory primacy over stormwater. At present, these states are AZ, FL, ID, LA, ME, MA, NH, NM, OK, TX, WA, DC, and U.S. territories (including the Commonwealth of Puerto Rico, Johnson Atoll, Wake Island and Midway Island) and American Indian reservations. There is essentially a separate permit for each sector. Of these sectors, six appear to be most applicable to air bases (most bases will include a maximum of six of the sectors). These are:

- K Hazardous Waste Treatment, Storage and Disposal Facilities. SIC = None (HZ) (60 FR 51175)
- L Landfills and Land Application Sites. SIC = None Provided (LF) (60 FR 51180)
- N Scrap and Waste Recycling Facilities. SIC = 5093 (60 FR 51189)
- P Motor Freight Transportation Facilities (vehicle maintenance and fueling facilities, vehicle washing) SIC = 40xx-43xx, 5171 (60 FR 51203)
- S Air Transportation Facilities (including aircraft and vehicle maintenance, washing and runway/aircraft deicing). SIC = 45xx (60 FR 51215)
- T Treatment Works (wastewater treatment plants). SIC = None (TW) (60 FR 51220)

There are three other sectors which could apply in special circumstances to some bases:

- O Steam Electric Power Generating Facilities, Including Coal Handling Areas SIC = None (SE) (60 FR 51197)
- Q Water Transportation Facilities (maintenance and equipment cleaning) SIC = 44xx (60 FR 51206)
- AA Fabricated Metal Products (plating, etc.) SIC = Specific 34xx (60 FR 51245).

There is no specific category for military installations. However, the regulation states that "Military installations must comply with the permit and monitoring requirements for all sectors that describe industrial activities such installations perform." (pp. 50804 and 51111). Therefore, candidate bases are required to thoroughly examine their operations to assure that all activities are assigned to the proper MSGP group, not just those listed above.

There are special requirements which apply to stormwater discharges associated with large and medium municipal separate storm sewer systems (which will not normally apply to bases), facilities subject to EPCRA Section 313 water priority chemical reporting requirements, and salt storage facilities. These special requirements differ from those in the Baseline General Permit (BGP). The most significant change from the BGP is the elimination of the requirement for whole effluent toxicity testing by facilities required to report under EPCRA Section 313.

b. The Baseline General Permit

The BGP covers the same states and territories and is more general than the MSGP. It lists monitoring requirements for 16 types of facilities, including special requirements for facilities subject to EPCRA Section 313 water priority chemical reporting requirements, and facilities with coal piles. There are also special requirements covering facilities which have salt piles and discharges to large and medium separate stormwater systems.

Facility types found in the Air Force which **may** be covered under a BGP include the following:

- (i) Facilities which must report under EPCRA Section 313 for water priority chemicals
- (ii) Land disposal units/incinerators/BIFs (Boilers and Industrial Furnaces)
- (iii) Industrial facilities with coal piles
- (iv) Airports (with over 50,000 flight operations per year)
- (v) Coal-fired steam-electric facilities (actually coal handling sites)
- (vi) Oil-fired steam-electric generating facilities (actually oil handling sites)

There is no specific facility type for military facilities mentioned in the BGP.

2. Application for Coverage

Both the MSGP and the BGP were generated by the EPA. Coverage under the respective permits is obtained by submission by the facility of a completed and signed Notice of Intent (NOI) (EPA Form 3510-6) to the EPA. The NOI must be signed by a principal executive officer of the facility. In effect, this means that the commander of a military base is the proper signatory. However, this signature authority can be formally delegated in writing (a copy of which is to be sent to the EPA) by the base commander to an appropriate subordinate. Any other documents, plans, correspondence or reports associated with the permit which must be submitted to the EPA or retained on file are to be similarly signed.

a. MSGP -Deadlines

- (i) Application: The effective date of the MSGP is 1 Oct 1995. An existing facility must file an NOI within 90 days of permit finalization, which is presumably 1 Oct 1995 (this date was later changed to March 96). A new facility must have made an NOI filing at least two days prior to commencement of new activity. Facilities presently covered by a BGP, but electing coverage under the MSGP may terminate BGP coverage by simultaneously filing a Notice of Termination (NOT) (EPA Form 3510-7) and a NOI (new EPA Form 3510-6) for MSGP coverage in the same 90-day period beginning 1 Oct 1995. An NOI from an existing facility which has previously been a member of a group application for the MSGP or who has a BGP may be filed after the initial 90-day period, but this may subject the applicant to, in the EPA's words, "appropriate enforcement actions."
- (ii) Stormwater Pollution Prevention Plan (SWP³) Preparation: The SWP³ must be complete and implemented within 270 days of MSGP finalization (presumably 1 Oct 1995). For facilities switching from the BGP, revisions to the plan to reflect requirements of the MSGP must be made within the same 270-day period.

- (iii) Construction: For facilities which must perform construction projects to implement structural measures required by the SWP³, completion of the project must be accomplished within three years of permit finalization (presumably 1 Oct 1995).

b. BGP

- (i) Application: The NOI was to have been initially submitted by 1 Oct 1992. It was stated in the regulation that late NOI submission could make the applicant subject to “appropriate enforcement actions.” Note that a facility making an application for coverage under a BGP after this date is subject to “Look Back” enforcement. This means that discrepancies in developing a SWP³, plan implementation, sampling, etc. go back to the deadline date and constitute violations of the regulation even if compliance is current.
- (ii) SWP³: The plan was to have been completed by 1 April 1993 and implemented by 1 Oct 1993.
- (iii) Construction: Construction deadlines are not specifically mentioned in the BGP. However, facilities required to report under EPCRA Section 313 must be in plan compliance by 1 Oct 1995, or not later than three years after a facility is first required to report under EPCRA Section 313. There are also three year limits for construction projects to protect salt and coal piles from stormwater under the “Special Requirements” provisions.

3. Discharge and Applicant Eligibility for Coverage Under Permit

a. MSGP

There are numerous requirements which govern the eligibility of different types of discharges for coverage under the MSGP, and also the status of the applicant to discharge under the conditions of the MSGP.

- (i) Discharges not covered under the permit include the following:
 - Discharges in compliance with a different NPDES permit (e.g, wastewater treatment plant effluent from a NPDES-permitted plant).
 - Discharges identified as nonstorm water discharges are identified water discharges other than those composed entirely of stormwater. This means that mixed storm- and nonstormwater may not be discharged, unless both are permitted, and excepting only the following: discharges from fire fighting activities, fire hydrant flushing, potable water from various sources, compressor condensate, irrigation drainage, lawn watering, external building wash down which does not use detergents, pavement washwaters which are uncontaminated by hazardous materials, air conditioner condensate, uncontaminated springs, uncontaminated groundwater, and foundation or footing drains where flows are uncontaminated with process materials. These must be stated in the SWP³.
 - Discharges which affect historical properties and endangered species, which do not comply with the National Historic Preservation Act or the Endangered Species Act.

- (ii) Virtually any facility in the groups covered in the MSGP are eligible, including those covered by a BGP. Applicants which have a current individual NPDES stormwater permit are ineligible for coverage. Applicants having an individual NPDES permit which has expired are eligible for coverage under the MSGP only when the expired permit did not contain numeric effluent limitations more stringent than those in the MSGP. (Note: most of the groups in the MSGP do not contain numeric stormwater effluent limitations. See 60 FR 50831 and 57 FR 41255 for exceptions)

b. BGP

There are no essential differences in eligibility of discharges or applicants between the MSGP and the BGP. However, there is no BGP language concerning historic properties.

4. National Historic Preservation Act and Endangered Species Act

One of the differences between the MSGP and the BGP is the MSGP's inclusion of more detailed protective language concerning historic properties and endangered species. The new NOI contains certification clauses in these areas which must be signed.

a. MSGP

- (i) Historic Properties: The EPA will not authorize permits for discharges which will affect historic properties (defined as those sites listed on the National Historic Register) unless measures will be taken, such as a written agreement between the facility and the State Historic Preservation Organization (SHPO) to mitigate or prevent adverse effects resulting from discharge or management practices to be taken to control discharge. The NOI (new EPA Form 3510-6), which must be submitted to obtain MSGP coverage, contains a certification that must be signed. This may not have much impact on federal facilities, as any action which would affect listed properties would be subject to SHPO coordination in any event.
- (ii) Endangered Species: The EPA will not authorize permits unless discharges or best management practices actions are not likely to jeopardize federally-listed endangered species. Addendum H to the MSGP lists endangered species in each state, county by county. Any actions under the permit which could be considered as endangering a listed species can be taken if it is coordinated and authorized under the Endangered Species Act. The NOI contains a certification clause to this effect which must be signed. Again, this may not be a particularly significant issue for federal facilities, in that possible effects upon endangered species would necessarily be determined for stormwater projects in any event.

b. BGP

- (i) The BGP regulations do not authorize, among other things, "stormwater discharges associated with industrial activity that may adversely affect a listed or proposed to be listed endangered or threatened species or its critical habitat..." However, there is no certification to this effect that must be signed on the old NOI form.
- (ii) The BGP regulations are silent concerning stormwater discharge or management practices effects upon historic properties.

5. SWP³ Requirements

a. MSGP

All MSGP industrial sectors require a SWP³. However, even though there is a degree of commonality in SWP³ content among the sectors, each sector has specific requirements provided in the regulation (such as frequency of inspection, specific best management actions to be developed, etc.). For example, the recycling sector (N) has a more extensive listing of requirements which must be included in the SWP³ than is found in the other likely sectors. It is presumed that a single SWP³ could be developed for a facility which contains all requirements for all applicable sectors rather than multiple SWP³s. The SWP³ must be kept updated, especially when pollution incidents (such as hazardous materials spills) occur which are determined to warrant immediate (within 14 calendar days) inclusion of new or modified preventive practices in the SWP³. Practices to comply with the National Historic Preservation Act and the Endangered Species Act must be included in the SWP³. The SWP³ must be consistent with other facility plans for spill prevention and control. **Most SWP³ details listed in 5.(b) (following) for the BGP are included in the MSGP, with the following significant differences:**

- (i) Comprehensive Site Compliance Evaluation: A very detailed inspection of the facility must be performed annually, resulting in a report which must be signed by an “authorized company official.” The report is not to be sent to EPA, but must be retained on site for at least three years. The SWP³ must be modified within two weeks to reflect any necessary changes resulting from the site evaluation. Under the BGP, less stringent facility inspections and reporting procedures were mandated. Periodic inspections of lesser scope under the MSGP are detailed in the SWP³ requirements for each industry group. For example, sector (S) requires weekly inspections during periods in which deicing chemicals are used, while other sectors require monthly, quarterly or annual “routine” inspections, in addition to the Comprehensive Site Compliance Evaluation.
- (ii) Employee Training: For many industry groups, training in stormwater pollution prevention is mandated to occur at least annually. Under the BGP, training intervals are what was stated in the SWP³, except that training for employees involved in EPCRA Section 313 water priority chemical areas was mandated to be performed annually. Also, the MSGP may require training topics which are specific for some groups. The Pollution Prevention Team is charged with identifying types of employees which must be trained. These would generally be those who “...play a role...” in activities which could generate contaminants which could find their way into stormwater discharges from the facility.
- (iii) PE Certification: The requirement under the BGP for certification and periodic recertification of the SWP³ by a registered professional engineer (PE) for facilities which are required to report under EPCRA Section 313 for water priority chemicals has been eliminated under the MSGP.

b. BGP

The SWP³ contents are generally intended to provide blanket coverage of all facility types. Plans must be kept updated, including immediate (14 calendar day) updates deemed necessary by the occurrence of spills. Mandated SWP³ contents include:

- (i) Facility Pollution Prevention Team (PPT): A group is required to develop the SWP³ and to assure its implementation. The PPT is largely responsible for developing, scheduling, and performing such activities as facility inspections and employee training programs, and assuring that such scheduled activities are shown in the SWP³.
- (ii) Description of Potential Pollution Sources: Includes drainage area maps, an inventory of exposed materials, a history of spills and leaks, a summary of existing discharge sampling data, and risk identification.
- (iii) Measures and Controls: A listing of management controls is provided, including good housekeeping practices, the preventive maintenance program, spill prevention and response procedures, facility inspections, employee training, record keeping and reporting procedures, certification of nonstormwater discharges, sediment and erosion controls, and runoff management.
- (iv) Engineering Certification: For facilities subject to EPCRA Section 313 water priority chemicals reporting, the SWP³ must be reviewed and certified by a registered PE. Also, a PE must recertify the SWP³ every three years.

6. Permit Expiration

a. MSGP

The duration of the MSGP is for a period of five years from 1 October 1995. If renewal is properly and timely applied for, the MSGP will remain valid pending notification of coverage from the EPA. In states not now having primacy in stormwater regulation, but achieving it prior to EPA permit expiration, the state permit would succeed the MSGP. EPA is encouraging states to adopt stormwater regulations substantially identical in form to the MSGP.

b. BGP

The BGP will expire on 9 September 1997. It is likely that EPA, when the BGP expiration date occurs, will replace the BGP with a permit very similar or identical to the MSGP. This supposes that there will, at that time, be no significant changes in the regulatory climate or congressional action to reduce or eliminate stormwater regulation.

7. Discharge Evaluation

Both the MSGP and the BGP include requirements for the assessment of stormwater discharges. The requirements are widely variable, and include both simple visual inspection and chemical analysis of stormwater discharge in some, but not all, instances.

a. MSGP

- (i) Visual Inspection: All of the listed sectors (except S) require quarterly sampling and visual inspection of stormwater outflow. Samples must generally be taken within one hour of the beginning of flow, and other specified sampling conditions must also be met. Sampling requirements are typical in defining a storm event as being over 0.1" of precipitation after at least 72 hours with no precipitation, and that sampling must be made

within one hour of flow start. Runoff from melting snow is also covered. These samples must be visually checked for presence of color, sheen, foam, and floating or suspended solids. Records of each visual inspection event must be kept. Presumably for a base with multiple sector requirements, a single sample per quarter per outfall would suffice. A quarter is defined as a calendar quarter (Jan-Mar, etc.), and a sample taken at any time within a calendar quarter is valid to fulfill the quarterly visual check requirement. This requirement does not exist in the BGP.

- (ii) Sampling for Chemical Analysis: As previously noted, sectors K, L, N and S (if deicing chemical use limits are exceeded) require chemical analysis of stormwater samples. Analysis records must be kept on site, and need not be submitted to EPA. The sampling schedule requires that samples be taken quarterly during the second year of the permit. If the numeric average over the four quarter history of the sample content contaminant levels exceeds “Benchmark” levels (provided in the MSGP), then quarterly sampling must be repeated during the fourth year of the permit. It is expected that actions will be taken to reduce contaminant levels found to exceed benchmark values in year two to levels less than those of the benchmark in year four. Although benchmark levels do not appear to be excessively strict, it is not known just how difficult it will be for any particular installation to stay within any particular benchmark value. The species to be analyzed for in each group are as follows:

<u>Group</u>	<u>Species for Analysis</u>
K (TSD Facilities)	NH ₃ , COD, As, Cd, CN ⁻ , Hg, Mg, Pb, Se, Ag
L (Landfills)	TSS, Fe
N (Recycling Facilities)	TSS, COD, Al, Cu, Fe, Pb, Zn
O (Steam-electric gen.)	Fe
P (Vehicle Maintenance)	Analysis is not required
Q (Water Transportation)	Al, Fe, Pb, Zn
S (Airports)	BOD, COD, NH ₃ , pH (required only for deicing chemical users of >100,000 gallons or >100 tons/year)
T (Treatment Works)	Analysis is not required
AA (Fab. Metal Products)	Al, Fe, Zn, Nitrogen as nitrate plus nitrite

NOTES: (1) Metal ion analyses are for recoverable metals.
 (2) See 60 FR 50831 for sectors having numeric effluent limitations possibly applicable to military facilities.

- (iii) Alternative Certification: In those groups in which sampling and laboratory analysis are required, the requirement may be avoided if the facility can certify that all sources of pollution are not exposed to stormwater. An example would be having all possible pollutant sources stored under a roof. This could be difficult in some cases, such as those involving landfills or recycling facilities which are usually unprotected from the elements. This can be an area-by-area certification, (i.e., part of the facility [or base] can be alternatively certified if it qualifies, while another area may not qualify.)

b. BGP

- (i) Quarterly sampling and visual assessment is not a requirement under the BGP.

- (ii) **Sampling and Analytical Requirements:** Generally, depending upon the nature of the facility, either annual or semiannual sampling of outfalls is required. Reports of semiannual analyses must be filed with EPA, while for those requiring annual testing, reports must merely be kept on site. Species specified for analysis are variable depending upon the type of facility. Following is a listing of sampling and analytical requirements:

<u>Facility Type</u>	<u>Species for Analysis</u>
<u>EPCRA 313 Reporters:</u>	Oil and grease, BOD5, COD, TSS, Kjeldahl Nitrogen, Phosphorous, pH, Acute WET, any water priority chemical which the facility must report
<u>Land Disposal Units:</u>	Ammonia, Mg, Kjeldahl Nitrogen, COD, TDS, TOC, Oil and Grease, pH, As, Ba, Cd, Cr, CN, Pb, Hg, Se, Ag, Acute WET
<u>Facilities with Coal Piles:</u>	Oil and Grease, pH, TSS, Cu, Ni, Zn
<u>Airports (>50,000 flights):</u>	Oil and Grease, BOD5, COD, TSS, pH, deicer
<u>Coal Fired Electric Generation:</u>	Oil and Grease, pH, TSS, Cu, Ni, Zn
<u>Oil Fired Electric Generation:</u>	Oil and Grease, COD, TSS, pH, any pollutant in an effluent guideline

NOTES

- (i) Facilities in bold face require semiannual sampling and annual reporting to EPA. Others require annual sampling with results kept on site. Metal ion analyses are for recoverable metals. Facilities in EPA Region 6 and also the State of Texas have additional stormwater effluent general limitations under the Clean Water Act, as provided at 57 FR 41255. Texas has verbally stated that it has no stormwater requirements which apply to military bases located therein.
- (ii) In those groups in which sampling and laboratory analysis are required, the requirement may be avoided if the facility can certify that all sources of pollution are not exposed to storm water. An example would be having all possible pollutant sources stored under a roof. This could be difficult in some cases, such as those involving sites which are usually unprotected from the elements.

APPENDIX I – SAMPLE BRIEFING SLIDES

The following section includes a summarized Microsoft Powerpoint slide presentation taken from a Stormwater Pollution Prevention Course prepared for the USAF Reserves by Science and Engineering Associates, Inc.

(Graphic MS Powerpoint presentation is available only in hard copy. The complete hard copy version of the presentation is available from PRO-ACT at DSN 240-4214.)

Sample Stormwater Pollution Prevention Training

Base Sewer Schematics

Regulatory Background

- 1972-Congress Enacts Clean Water Act
 - ◆ regulates wastewater pollution
- 1987-Congress Amends Clean Water Act
 - ◆ regulates stormwater pollution
- 1991-The EPA Begins its Stormwater Program
 - ◆ pollution prevention is the focus

Regulatory Background

Pollution Prevention

- 1992-1994-Industrial Facilities, including Air Force bases, implement pollution prevention procedures
- 1995-Stormwater Training Course

Base Stormwater Pollution Prevention Program

- Plan
- Stormwater Team
- Best Management Practices
- Training
- Inspection and Review

Course Outline

- Sources of Stormwater Pollution at Your Base
- Pollution Effects on the Environment
- Best Management Practices (BMPs) for Preventing Stormwater Pollution
- Spill Response
- Base Stormwater Inspections
- Question and Answer

Sources of Stormwater Pollution at Your Base

- FUEL STORAGE AND TRANSFER
- Hazardous Material Storage
- Maintenance
- Aircraft and Runway Deicing
- Outdoor Washing
- Illicit Connections
- Soil Erosion

Sources of Stormwater Pollution at Your Base

- Fuel Storage and Transfer
- HAZARDOUS MATERIAL STORAGE
- Maintenance
- Aircraft and Runway Deicing
- Outdoor Washing
- Illicit Connections
- Soil Erosion

Sources of Stormwater Pollution at Your Base

- Fuel Storage and Transfer
- Hazardous Material Storage
- MAINTENANCE
- Aircraft Runway and Deicing
- Outdoor Washing
- Illicit Connections
- Soil Erosion

Sources of Stormwater Pollution at Your Base

- Fuel Storage and Transfer
- Hazardous Material Storage
- Maintenance
- AIRCRAFT AND RUNWAY DEICING
- Outdoor Washing
- Illicit Connections
- Soil Erosion

Sources of Stormwater Pollution at Your Base

- Fuel Storage and Transfer
- Hazardous Material Storage
- Maintenance
- Aircraft and Runway Deicing
- OUTDOOR WASHING
- Illicit Connections
- Soil Erosion

Sources of Stormwater Pollution at Your Base

- Fuel Storage and Transfer
- Hazardous Material Storage
- Maintenance
- Aircraft and Runway Deicing
- Outdoor Washing
- ILLICIT CONNECTIONS
- Soil Erosion

Sources of Stormwater Pollution at Your Base

- Fuel Storage and Transfer
- Hazardous Material Storage
- Maintenance
- Aircraft and Runway Deicing
- Outdoor Washing
- Illicit Connections
- SOIL EROSION-#1 Source of Water Pollution

Allowable Discharges

- Fire Hydrant/System Flushings
- Fire Fighting Activities
- Foundation/Footing Drainage
- Natural Springs
- Exterior Building Wash Downs (No Detergents)
- Irrigation Drainage
- Uncontaminated Pavement Wash Downs

Allowable Discharges

- Potable Water Line Flushings
- Lawn Watering
- Air Conditioning Condensate
- Uncontaminated Groundwater

Effects of Sediment on the Environment

- Dirt and Mud Settle to the Bottom of a River or Lake, Creating a Sheet of Sediment
- Fish Spawning Grounds are Destroyed
- Clogs the Gills of Fish
- Can Carry Heavy Metals (Toxics)
- Lakes and Rivers Become Shallow

What Causes Fish Kills?

- Toxicity
 - ◆ Toxic=Poisonous
 - ◆ Fuels and Deicing Fluid
- Oxygen Depletion
 - ◆ Organic Substances: Soap, Oil, Fuel, Deicing Fluid, etc., can reduce oxygen levels in water
 - ◆ Fish Suffocate and Die

Biodegradable

- But is it Environmentally safe?

Best Management Practices (BMPs)

- How can we keep stormwater clean?

Oil/Water Separator Schematic

Good Housekeeping Practices at Maintenance Areas

- Perform Maintenance Activities Inside
- Use Dry Cleanup Methods for Spills
- Use a Wet Mop for Routine Floor Washing
- Recycle Wastes
- Conduct Routine Visual Inspections

Key Soil Erosion/Construction BMPs

- Protect Storm Sewer Inlets
- Hay Bales or Silt Fences
- Preserve the Natural Vegetation
- Revegetate Disturbed Soils
- Cover Soil Piles with a Tarp

What to do if there is a spill....2-Minute Drill

- Safety First-Don't Take Risks
- Stop the Spill at its Source
- Protect Drains and Storm Sewers
- Call the Fire Department (if necessary)
- Spread Absorbent Material
- Dispose of the Spilled Material Appropriately

Fines and Penalties

- Penalties can be levied on an individual
- Negligent/Accidental Violations
 - ◆ \$2,500 to \$25,000 per day and/or
 - ◆ up to 1 year in prison
- Knowing Violations
 - ◆ \$5,000 to \$50,000 per day and/or
 - ◆ up to 3 years in prison
- Knowing Endangerment
 - ◆ up to \$250,000 and/or
 - ◆ up to 15 years in prison

APPENDIX J - SWP³ CHECKLISTS

(Graphic pages - available only in hard copy. These Checklists or the complete hard copy version of the SWP³ Guide are available from PRO-ACT at DSN 240-4214.)

APPENDIX K - EPA OVERVIEW OF THE STORMWATER PROGRAM

The following section includes an overview of the stormwater program published by the EPA in 1992. Some of the deadlines it gives are dated, however, the guide provides a good summary of the stormwater program from the EPA's perspective. The stormwater manager should check with the REO or regulator if questions arise.