Goddard Space Flight Center (GSFC) Stormwater Pollution Prevention Plan Training

April 24, 2019

Presented by
GSFC's Medical and Environmental Management Division (MEMD)

Purpose

- Goddard Space Flight Center's (GSFC) National Pollutant Discharge Elimination System (NPDES) permit requires annual stormwater pollution prevention training for all Activity Coordinators identified in the SWPPP.

Agenda

- ❑ Introduction to Stormwater
- ❑ Stormwater Pollution Prevention Plan (SWPPP) Overview
- ❑ Activities Covered by the SWPPP
- ❑ Activity Coordinator Responsibilities
- ❑ Best Management Practices (BMPs)
- ❑ Types of Discharges
- ❑ Construction Related Stormwater Controls
- ❑ Spills and Spill Reporting Procedures
- ❑ Summary

Introduction to Stormwater

Our Place in the Watershed:

Goddard is located between two watersheds, the Anacostia and Patuxent rivers, that feed into the Chesapeake Bay.

Stormwater and the Chesapeake Bay:

- The Bay is the largest, most biologically diverse estuary in North America and the 3rd largest in the world. **Stormwater runoff is a primary pollutant affecting the Bay.**
- As stormwater (rainfall or snow melt) flows over hard surfaces and travels to waterways, it can become polluted with oil and grease, fertilizer, trash, salt, sediment, and other contaminants.
- Once introduced into waterways (such as the Chesapeake Bay), it has the potential to impair water quality and harm aquatic life.

Where does runoff from GSFC go?

From roads/walkways

To the Stormwater System

Surface waters (such as the Chesapeake Bay)

Stormwater Pollution Prevention Plan Overview

- GSFC has a Storm Water Pollution Prevention Plan (SWPPP) for the Greenbelt campus to reduce or eliminate our potential storm water pollution impacts.
- Coincides with State permits that regulate GSFC's storm water discharges.

All GSFC projects must comply with construction and environmental permits, project-specific Storm water Management/Erosion and Sediment Control plans, and the GSFC SWPPP.

Activities Covered by the SWPPP

Activity
Salt Dome
Shipping and Receiving Facilities (B-35) Loading/Unloading Docks
Landscaping Facility
Staging and Storage Areas
<90-day Waste Accumulation Facility
Heating and Refrigeration Plants
Vehicle Maintenance Facility
Potable Water Discharges
Fire Control System Flushing
Domestic Water Distribution Lines Flushing
Hydrostatic Testing, Maintenance or Flushing of the Water Tower

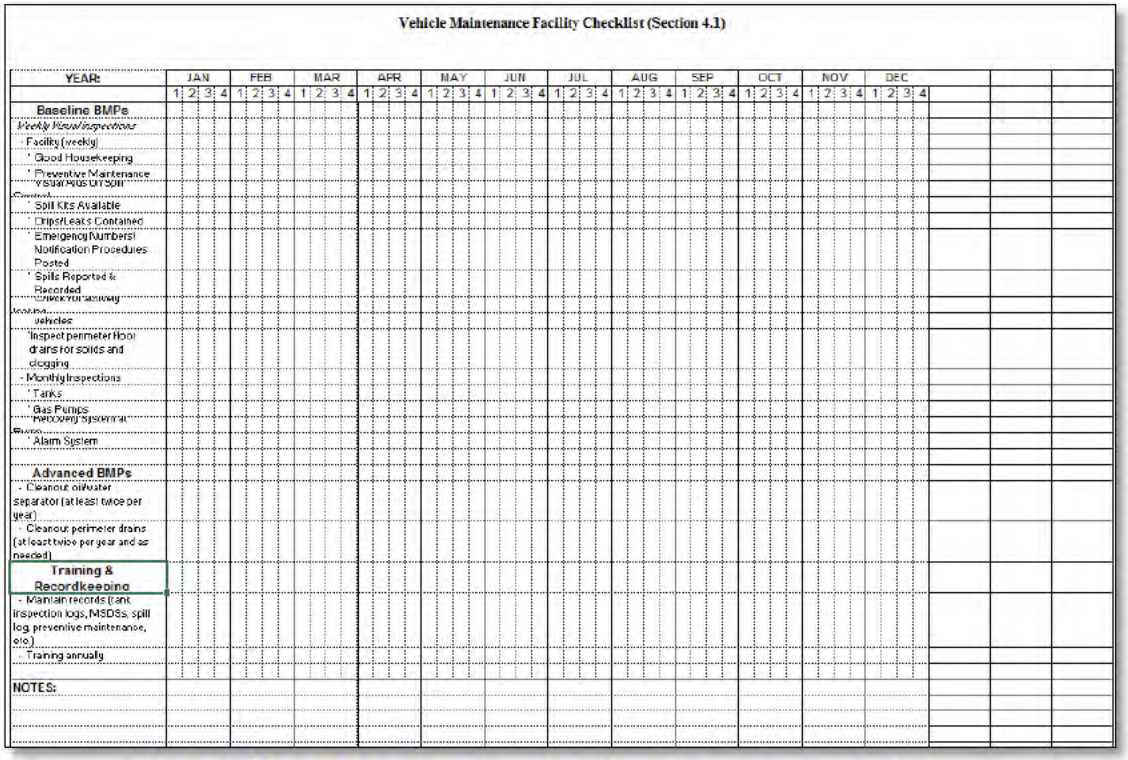
Activity Coordinator Responsibilities

An Activity Coordinator (AC) is assigned for each activity covered by the SWPPP. They are listed in Appendix A, GSFC Storm Water Prevention Plan Team (SWPPT). Responsibilities include:

- ❑ Enforce compliance with the SWPPP and assist in annual SWPPP compliance inspection;
- ❑ Conduct routine inspections using activity specific checklist (see Appendix E of the SWPPP);
- ❑ Manage all records required by the SWPPP, such as checklists and preventive maintenance logs, for at least 3 years;
- ❑ Identify, report (to MEMD), and correct deficiencies that may affect stormwater quality;
- ❑ Complete annual SWPPP training and verify all activity personnel have completed annual training;
- ❑ Attend the annual SWPPP Team meeting; and
- ❑ Complete the GSFC-Greenbelt Integrated Contingency Plan (ICP) annual training (if you use/witness/supervise the usage, storage, and/or transfer of oil or petroleum products).

Checklists for Inspections

- Each activity covered by the SWPPP has a specific checklist of inspection requirements; this is due to change to ONE checklist for ALL facilities upon the next SWPPP update (expected AUG 19).
- Inspection frequencies differ between activities/areas.
- Currently checklists are located in Appendix E of the SWPPP. Individual checklist files can be obtained via the SWPPT Website, located in "Checklists".



Vehicle Maintenance Facility Checklist (Section 4.1)

YEAR:	JAN				FEB				MAR				APR				MAY				JUN				JUL				AUG				SEP				OCT				NOV				DEC			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Baseline BMPs																																															
Weekly Housekeeping Inspections																																															
- Facility (weekly)																																															
' Good Housekeeping																																														
' Preventive Maintenance w/stain pads on spill																																														
Spill Kits Available																																														
' Drips/Leaks Contained																																													
' Emergency Numbers/ Notification Procedures Posted																																													
' Spills Reported & Recorded																																													
Check for leaking vehicles																																													
Inspect perimeter floor drains for solids and clogging																																													
- Monthly Inspections																																													
' Tanks																																													
' Gas Pumps																																													
' Recovery System																																													
' Alarm System																																													
Advanced BMPs																																													
- Cleanout oil/water separator (at least twice per year)																																													
- Cleanout perimeter drains (at least twice per year and as needed)																																													
Training & Recordkeeping																																													
- Maintain records (tank inspection logs, MSDSs, spill log, preventive maintenance, etc.)																																													
- Training annually																																													
NOTES:																																													

*Ensure that the most recent version of the SWPPP checklist is being used.

http://gs279sharepoint2.gsfc.nasa.gov/sites/ems/SWPPT/default.aspx

Best Management Practices

BMPs are activities, policies, and procedures that prevent pollution of stormwater. The NPDES program requires the SWPPP to include the following BMPs:

- ❑ Good Housekeeping,
- ❑ Preventive Maintenance, and
- ❑ Visual Inspections.

Weeding the building 32 bioretention basin

Good Housekeeping

Good Housekeeping is necessary to maintain a clean facility and prevent pollution.

Examples include:

- ❑ Clean and organized storage areas.
- ❑ Drips and leaks from equipment or pipes repaired, contained, and collected.
- ❑ Adequate space in work areas to minimize spills.
- ❑ Garbage and trash removed regularly.
- ❑ Storm drains kept free of debris.
- ❑ No evidence of dust from painting, sanding, or other industrial activities.
- ❑ Good housekeeping reminders and inspection schedules posted.
- ❑ Complete spill kits available and in good condition.
- ❑ Proper storage of materials away from the elements and with secondary containment.

Check on Learning

Which of these pictures shows an example of good housekeeping? Why?

1

2

3

Preventive Maintenance

Involves regular inspections, maintenance, testing, and repair or replacement of equipment and/or systems to ensure they are fully operational.

Examples include:

- Repair or replacement of defective equipment and corrections of deficiencies identified during routine inspections;
- Post preventive maintenance reminders, and inspection schedules;
- Inspect equipment used to handle materials with the capability to pollute stormwater, and;
- Regular inspection and maintenance of stormwater runoff management structures (e.g., bioretention areas, stormwater ponds and outfalls, etc.).

Check on Learning

Which of the following are examples of preventive maintenance?

- ❑ a. Prompt repair/replacement of defective equipment and resolution of problems identified during routine inspections.
- ❑ b. Maintenance reminders, posters and inspection schedules kept in management offices.
- ❑ c. Inspection records maintained for the Fiscal Year (FY).
- ❑ d. Unscheduled, random inspection and maintenance of pumps, pipes, hoses, pressure vessels, etc., and storm water runoff management devices.

Visual Inspections (VI)

A routine "once over" of the facility/area to identify conditions that have the potential to pollute stormwater runoff. VI's help identify the following:

- ❑ Corroded/damaged drums and tanks
- ❑ Drums missing plugs or covers
- ❑ Torn bags or materials exposed to precipitation
- ❑ Evidence of leaking pipes, valves, and/or pipe fittings
- ❑ Broken/cracked berms, dikes, walls, etc.
- ❑ Water conditions (e.g., oily sheen)
- ❑ Clogged or damaged storm drains
- ❑ Excessive vegetation growth around stormwater management structures
- ❑ Erosion

Visual Inspections: Stormwater Structures

Check on Learning

Which of these indicates failed visual inspections? Why?

1

2

3

Types of Discharges

- ***Non-Stormwater Discharges*** can be any flow that does not consist entirely of stormwater. Potable (domestic) water discharges are an example of a non-stormwater discharge.

- ***Emergency Discharges*** are unauthorized discharges to the storm drain system that are unavoidable, such as broken steam or sanitary sewer pipes, water tower overfills, etc. They are usually detected and repaired immediately.

- ***Illicit Discharges*** are discharges that would require a permit–to discharge or are strictly prohibited. Illicit discharges at GSFC occur when there is a failure or rupture in the system that cannot be readily repaired. Corrective actions for illicit discharges are tracked and reported to the State of Maryland under the requirements of GSFC's NPDES MS4 permit.

Notify MEMD of discharges that do not seem attributable to stormwater, even if the water is clean or does not seem to present a pollution potential. MEMD will determine if the discharge is permitted or unauthorized, and report it to the appropriate regulatory authority, if required.

Non-Stormwater Discharges (NSWD)

GSFC Activities that could result in NSWDs include:

- ❑ Dewatering operations
- ❑ Potable water discharges
- ❑ Illicit connections and discharges (solid or liquids)
- ❑ Vehicle and equipment fueling (spills)
- ❑ Washing vehicles and equipment
- ❑ Storage and staging area materials
- ❑ Construction wastes
- ❑ Construction site exits & offsite vehicle tracking
- ❑ Concrete washouts

Concrete washout water

Sediment

NSWD: Potable Water Discharges

GSFC Activities that could result in potable water discharges include:

- ❑ Fire control system flushing
- ❑ Domestic water distribution lines flushing and sanitizing
- ❑ Hydrostatic testing, maintenance or flushing of the water tower

Why do potable water discharges pose a concern?

- ❑ Potential for stormwater pollution (chlorine and suspended solids)
- ❑ Potential erosion caused by discharge of potable water at high rates/volumes
- ❑ Potable water discharges should be discharged to the sanitary sewer system whenever possible
- ❑ Mandated reporting and monitoring requirements may exist

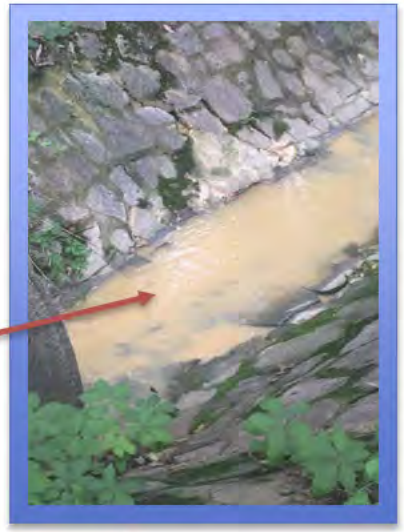
Contact MEMD **at least one week** before planned discharges from these activities or immediately in case of accidental discharge of potable water to the storm sewer system so that permit reporting and monitoring requirements can be verified.

Illicit/Emergency Discharges

GSFC events that could result in illicit discharges include:

- ❑ Blockages
- ❑ Line/pipe breaks
- ❑ Water tower overflows
- ❑ Sanitary Sewer Overflows (SSO)

If stormwater looks like this during BMP inspections, it may be caused by an illicit discharge.



If you see water flowing from a stormwater pipe and it hasn't rained in 48-hours, you may be seeing an illicit discharge.

Illicit/Emergency Discharges: SSO

GSFC Activities that could result in Sanitary Sewer Overflows include:

- Sanitary wastewater that cannot make its way through the sewer pipes, primarily due to blockages or breaks, can overflow into storm drains and surface water.

Why do SSO discharges pose a concern?

- SSOs that reach the storm sewer system or surface water violate GSFC's NPDES permits and must be reported to the Maryland Department of the Environment (MDE).

- SSOs have the potential to introduce untreated wastewater and/or raw sewage into creeks and rivers that flow into the Chesapeake Bay.

Report suspected SSOs to the Security Operations Center (SOC) immediately. MEMD will respond to assess the site and notify MDE. Refer to Section 7.2 of the SWPPP for procedures that should be followed in the event of an SSO.

Check on Learning

- **Scenario #1: A pipe has burst inside an industrial building and has flooded the facility to include chemical storage areas. You must contain the flood and remove the flood waters. What do you do?**

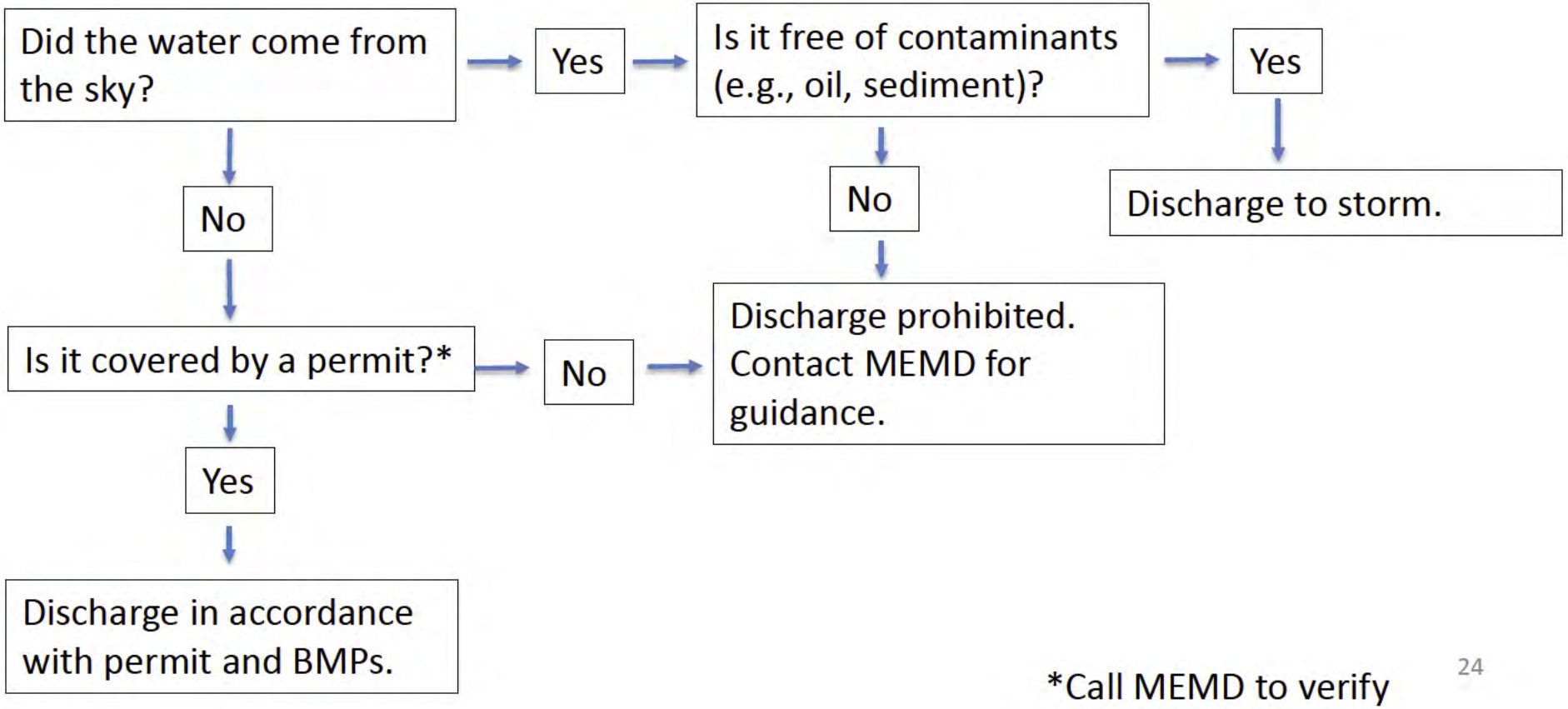
  a. Dump flood water down the floor drain to the sanitary sewer.

  b. Pump the flood water outside the facility to the ground or storm drain.

  c. Report it to the SOC and contact MEMD before taking further action.

- **Scenario #2: The water tower has overflowed, discharging potable water into the nearest storm drain. You do not need to notify anyone because this discharge is covered by GSFC's NPDES general permit. True or False?**

Let's Review: Where can the water go?



*Call MEMD to verify

Construction Site Management: Stormwater Controls

- All GSFC construction projects that result in any soil disturbance, regardless of size, must comply with Maryland's most recent erosion and sediment control standards and specifications and GSFC's SWPPP.

- Dewatering activities for construction projects resulting in a land disturbance of > 1 acre must be must be authorized by a permit.

Construction Site Management:
What tends to go wrong?

BMP's:

- ❑ Not implemented.
- ❑ Not maintained (must be checked before and after storm events).
- ❑ Do not function as designed.
- ❑ Not adapted for changing site conditions.
- ❑ Inspection recommendations NOT implemented; failure to close out findings.

This leads to…

Construction Site Management: Stormwater Pollution

Sediment runoff

Erosion and sediment buildup

Storm drain blockage/flooding

- Failure of construction site BMPs leads to unpermitted or illicit discharges which have the potential to pollute stormwater effluent from GSFC and ultimately State/National waters.

Structural vs. Non-Structural BMPs

Structural

- ❑ Silt fences
- ❑ Sedimentation ponds
- ❑ Erosion control blankets
- ❑ Temporary/permanent seeding

Storm drains must be protected and controls cleaned/repaired after rain events to prevent clogging and flooding.

Silt fences must be inspected, maintained, used for their intended purposes (i.e., not to control water, but to *filter and contain sediment)* and cannot have sediment buildup ≥25% of the fencing height.

Non-Structural

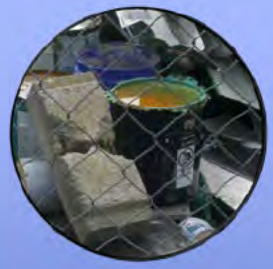
- ❑ Picking up trash/debris
- ❑ Sweeping nearby sidewalks/streets
- ❑ Maintenance of equipment

Spills

Report all spills, including oil leaks from **ALL** vehicles traveling on Center, immediately so appropriate regulatory reporting and clean up can be accomplished. Examples of reportable spills or releases include:

Antifreeze or oil leaking from a car

Hydraulic fluid leaking from heavy equipment



Chemicals leaking from materials outside

Sewage or domestic water releases from line breaks or overflows.

Spill Reporting Procedures

1. Protect yourself and those nearby from the release.

2. Call **911** from a GSFC phone or **301-286-9111** from a mobile phone or **radio** the Security Operations Center (SOC) from a GSFC-issued radio. Report the following information:

   - ☐ Name, code, and phone number of reporting party
   - ☐ Location and type of emergency (e.g., chemical or oil spill)
   - ☐ Any injured personnel
   - ☐ Type and name of chemical
   - ☐ Estimated quantity and flow rate (if known)
   - ☐ Does spill pose a risk to people or the environment?
   - ☐ Is spill controlled or contained?
   - ☐ Has spill entered any surface waters, drains, etc.?

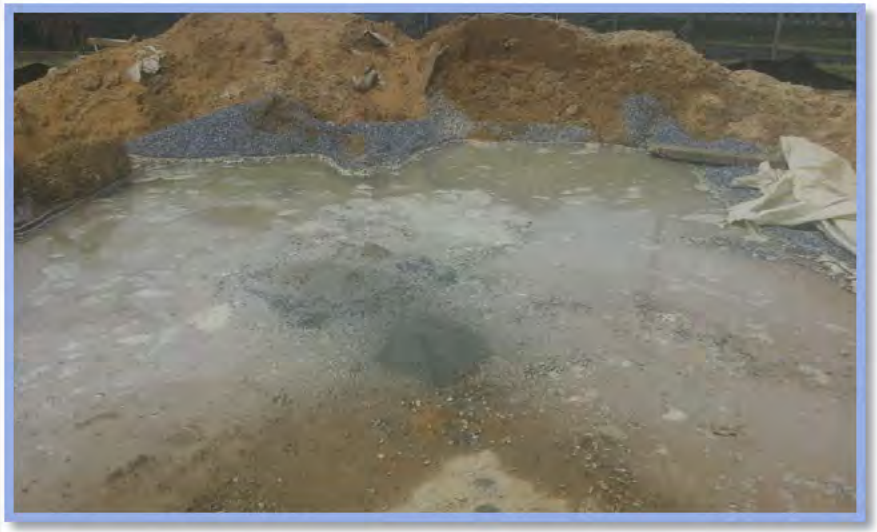
3. Security is the first responder and serves as the incident commander (IC) for a spill; follow direction from the IC.

**If you are unsure whether a spill is reportable, REPORT IT! When spills are not reported quickly, they cause more damage to the environment and require a greater clean-up effort.*

Practical Exercise: What's wrong here?

Practical Exercise: What do you see?

Practical Exercise: Identify the Issues



Practical Exercise: Identify the positives!

Summary

- Unless specifically permitted, only stormwater belongs in storm drains.
- Activity Coordinators should ensure that all GSFC SWPPP BMPs are being met for their activity.
- Any observed or suspected illicit and emergency discharges to the stormwater system should be reported to MEMD immediately.
- Any observed spills should be reported to the SOC immediately.

- Always check the SWPPP for the most current information. Visit https://itcdsp13.gsfc.nasa.gov/sites/ems/SWPPT/default.aspx for the SWPPP, Activity Checklists, and program contacts.

Keeping GSFC clean and protecting the environment is everyone's job.

SWPPP Contact

Lori Levine
Lori.M.Levine@nasa.gov
6-6741

All environmental program points of contact are available on the MEMD website:
https://code200-external.gsfc.nasa.gov/250/

When in doubt, contact MEMD