Fort Stewart/Hunter Army Airfield
Stormwater Management Program
Municipal Separate Storm Sewer System

Illicit Discharge Detection and Elimination Plan
Dry Weather Screening

Georgia General NPDES Stormwater Permit GAG480000 for Discharges Associated with Small Municipal Separate Storm Sewer Systems (MS4) At Military Facilities

July 2024 Version

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

JAMES L. HEIDLE
Director, Public Works

Table of Contents

List of Appendices

Dry weather screening procedures described in the following subsections have been developed using various guidance documents and are deemed to be the most appropriate for Fort Stewart/Hunter Army Airfield (FSGA/HAAF) land use, resources, and constitute a program that will be the most likely to detect illicit discharges within the Municipal Separate Storm Sewer System (MS4).

1. Dry Weather Screening Location and Schedule

At a minimum, FSGA/HAAF will screen 1 sub-basin of the MS4 outfalls annually, with 100% of the outfalls screened within the 5 year permit cycle. In the event a potential illicit discharge is found, and based upon field observations, sample collection and analyses shall be performed.

Outfalls sampled during each year will be noted on a map, along with a table of results will be submitted with the Annual Report.

2. Field Screening/Sampling Procedures

a. Weather Conditions: Screening will take place during dry weather conditions (i.e. no rain events for 72 hours previous to sample event). If there is no flowing water at the time of field screening, the sample team will record "no flow observed". If flow is observed, the sample team will perform visual/chemical/bacteriological monitoring (as described below) to determine if there is an illicit discharge.

b. Visual Monitoring: Sample team will record the following observations about the discharge at the outfall using the inspection checklist as shown in Appendix A:

   1) Look for obvious illicit connections to a stream such as a small diameter pipe emptying into the stream.

   2) Any outfalls discharging into a stream during dry weather should be noted on the inspection checklist. Describe the location and take GPS reading.

   3) Visually inspect the discharge for rate of flow, color, presence of oil sheen, settleable solids, floatable solids, and odor. Note finding on the inspection checklist.

   4) Visually inspect the discharge for biological indicators including emergent vegetation, algae blooms, lack of or stunted vegetation, presence or absence of aquatic life, and fish kills. Note finding on the inspection checklist.

c. Chemical Monitoring: Sample team will sample dry weather discharge flow for the following parameters, only if observations indicate a potential pollutant, illicit discharge, or team otherwise determines a need to sample:

   1) Samples should be collected from the dry weather discharge outfall, and not the stream.

2) Measure the discharge from the outfall for the following parameters using a probe(s): pH, temperature, and conductivity.

3) Sample the discharge with a colorimeter or test kit for surfactants and total fluoride. The presence of fluoride indicates a treated drinking water source.

d. Bacteriological Monitoring: Collect grab samples for fecal coliform analysis if conductivity or surfactants are high, or if obvious signs are present such as smells, a milky white or gray color, floatables, or if other applicable evidence exists for potential sanitary wastewater discharge.

e. Extended Chemical Monitoring: Sample team will collect additional samples for other parameters as shown in Appendix B, if more information is required to identify potential pollutants. The additional parameters sampled may include, but are not limited to ammonia, metals, volatile organic compounds, semi-volatile organic compounds, pesticides, herbicides, or any other water priority pollutants.

3. Baseline Limits for Sampling Parameters

If dry weather field sampling detects limits of the above mentioned parameters that exceed the baseline limits described in Appendix C, an illicit discharge is likely and an attempt to trace the source using the procedures outlined in Section 4 must be performed. The following parameters were chosen to address the potential contaminates most likely to be found in wastewater, wash water, construction site runoff, and industrial contaminants.

4. Illicit Discharge Source Tracking

a. Drainage Area: Upon identification of an illicit discharge, the team will review the storm sewer map and determine the flow path of the respective storm sewer to upstream industrial or municipal activities and possible sources within the drainage area.

b. Observations: The team will perform field work, including site visits, at potential upstream sources to observe activities, sources, and locations. If observation activities do not locate the source, further actions will be performed.

c. Upstream Sampling: Personnel will determine upstream potential drainage pathways that lead to the outfall where sample results indicate an illicit discharge and try to collect samples from the storm sewer system. The sample collection will be methodical, focusing at first on large piping systems, to identify which specific area within the drainage system to continue source tracking. Upstream sampling should be continued until the source is determined, or efforts result in no detectible discharge.

d. Dye Testing: Continuous discharges may be detected using biodegradable dye approved for use in waterways.

e. Smoke Testing: If determined necessary, smoke testing can be used to identify illicit connections between the storm sewer and industrial or sanitary sewer systems.

f. Closed-Circuit Television (CCTV): May be used in the event other source identification activities are not effective.

5. Quality Assurance/Quality Control Procedures

a. Confirmation: All visual observations must be confirmed by at least two team members. Field tests must be performed twice if a baseline limit is exceeded to confirm positive results.

b. Equipment: Probe(s) will be used to measure pH, temperature, and conductivity.

c. Probes: Any probe used to measure pH, temperature, and conductivity must be calibrated and documented at the start of each day when sampling will take place. Readings should be taken directly in outfall flow, if possible. All probes should be washed with deionized water before and after a reading is taken. If in-flow sampling is not possible, then a container or bucket should be used to collect a sample to take readings. The container/bucket should be rinsed twice with flow from the outfall and readings taken on the third fill.

d. Colorimeter or Test Kits: Containers used to test samples in the colorimeter or test kits must be rinsed twice with sample water before a sample is analyzed. Manufacturer's directions should be followed for all reagents used. After a sample has been analyzed, the container should be rinsed with distilled water. All reagent waste must be disposed of properly. Reagents will be checked and replaced prior to expiration.

e. Fecal Coliform Procedure: Fecal coliform samples must be taken directly in the outfall flow in a sterilized container to avoid contamination. Samples will be dechlorinated with sodium thiosulfate and stored in a cooler with ice. Samples will be processed within six hours of the event. Fecal samples may only be performed once at applicable outfalls during sampling events due to cost and lab scheduling considerations. Fecal coliform samples will be taken to a local Georgia-accredited contract laboratory.

6. Sample Team and Training

The sample team will consist of two or more people. FSGA/HAAF will ensure that sample team members will be trained on the procedures described herein prior to performing dry weather screening. FSGA/HAAF will train staff internally or send staff to similar training being conducted locally.

7. Data Collection and Reporting

The sample team will be responsible for the collection of all dry weather screening data, keeping copies on site, and including copies in the Annual Report to GA EPD. Should a suspected illicit discharge be detected through the dry weather screening program, it will also be the responsibility of the sample team to notify the Stormwater Project Manager who will initiate source tracking procedures as described herein.

8. Illicit Discharge Detection and Elimination Program Evaluation

In order to ensure that the Illicit Discharge Detection and Elimination (IDDE) program is effectively removing illicit discharges from the MS4, an analysis of FSGA/HAAF IDDE program will be conducted annually, and the results will be included in the Annual Report. The analysis will include the results of the dry weather screening and an analysis of the overall trends in water quality as indicated by dry weather screening. It is expected that water quality will improve from year to year as illicit connections are discovered and eliminated, and general awareness is improved.

The appropriateness of locations screened will also be included in the program evaluation. The analysis will also include the number of illicit discharge sources identified, and which method was used to identify the source (dye testing, CCTV, field sampling, inspection, etc.). This will allow FSGA/HAAF to determine which method of illicit discharge source tracing is most valuable and efficient. Lastly, the analysis will identify the amount and type of illicit connections removed.

Appendix A

Fort Stewart/Hunter Army Airfield
Stormwater Compliance Program
Dry Weather Screening Outfall Inspection

Installation: Outfall Sub-basin: Inspector: Signature: _____

Outfall Name	Date	Inspected during dry weather conditions	Flow Present	Photo taken	Additional information provided

Revised Jan 24

Fort Stewart/Hunter Army Airfield
Stormwater Management Program
Municipal Separate Storm Sewer System
Illicit Discharge Detection and Elimination Plan Dry Weather Screening

The following additional information only applies when an outfall has flow present:

Outfall Name	Emergent Vegetation	Algae Growth	Odor	Color	Clarity	Floatable solids	Deposits / Stains	pH S.U.	Chlorine mg/L	Comments

Revised Jan 24

Appendix B

Indicator Parameters Used to Detect Illicit Discharges

Parameter	Discharge Types That Can Be Detected				Laboratory/Analytical Challenges
	Sewage	Wash Water	Tap Water	Industrial or Commercial Liquid Wastes	
Ammonia	●	Θ	○	Θ	Can change into other nitrogen forms as the flow travels to the outfall
Boron	Θ	Θ	○	N/A	
Chlorine	○	○	○	Θ	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	Θ	Θ	○	Θ	
Conductivity	Θ	Θ	○	Θ	Ineffective in saline waters
Detergents-Surfactants	●	●	○	Θ	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	Θ	○	○	○	24-hour wait period for results. Need to modify standard.
Fluoride*	○	○	●	Θ	Reagent is hazardous waste. Exception for communities that no not fluoridate their tap water.
Hardness	Θ	Θ	Θ	Θ	
pH	○	Θ	○	Θ	
Potassium	Θ	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	Θ	Θ	○	Θ	

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g. tap water or natural water). For tap water, can distinguish from natural water.
Θ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter.
○ Poor indicator. Cannot reliably detect illicit discharges or cannot detect tap water.
N/A: Data not available to assess the utility of this parameter for this purpose.
* Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia, and potassium), it can always distinguish between sewage and wash water.

Appendix C

Baseline for Sample Parameters			
Parameter	Baseline Limit	Considerations	Potential Source of Contamination
pH	<6.0 or >9.0	pH at Fort Stewart/HAAF outfalls is historically between 6.0 and 7.0. pH detected between 5.5 and 6.0 is like due to influence of ground water.	Low pH – Industrial activities including metal plating, metal finishing/fabrication, fertilizer / pesticide application runoff, industrial wastewater spill, or illegal discharge. High pH – Industrial activities including aircraft depainting, metal plating, concrete wastewater, industrial wastewater spills, or illegal discharge.
Conductivity	300 umho/cm (Residential) 2000 umho/cm (Industrial)	Saline waters will have a higher conductivity.	Presence of contaminating ions from wastewater (sanitary or industrial)
Temperature	Greater than ambient	75.3-76.9 deg F is what is expected for recreational waters in GA. Temp should not exceed 90F.	Industrial wastewater, cooling tower discharge, steam condensate, or other industrial process water
Surfactans-Detergents	>0.25 ppm (Residential) >5.0 ppm (Industrial)	Presence of suds or large quantities of bubbles is indicator.	Industrial and household wash water, wastewater
Fluoride	Any detection	Treated drinking water	Water main break or service line/lateral leak
Fecal Coliform	Apr – Oct: 200 col/100ml Nov – Mar: 1000 col/100ml	Fecal Coliform in excess of standards does not necessarily indicate high level of sanitary sewage. Could potentially be due to wildlife or residential animals.	Animal waste or sanitary sewage