

FORT STEWART/HUNTER ARMY AIRFIELD STORMWATER MANAGEMENT PROGRAM

DRY WEATHER SCREENING PROCEDURES

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 land use, resources, and environment, and constitute a program that will be the most likely to detect illicit discharges within the MS4.

1. Dry Weather Screening Location and Schedule:

Fort Stewart/Hunter Army Airfield will annually screen 20% of MS4 outfalls in accordance with the MS4 Stormwater Management Plan (SWMP) Best Management Practice IDDE-#3. 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, and that map, along with a table of results will be presented in the Annual Report.

2. Field Screening/Sampling Procedures:

- a) *Weather Conditions:* Screening will take place during dry weather conditions (i.e. no rain event 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:
 - Look for obvious illicit connections to a stream such as a small diameter pipe emptying into the stream.
 - Any outfalls discharging into a stream during dry weather should be noted on the inspection checklist. Describe the location and take GPS reading.
 - Visually inspect the discharge for rate of flow, color, presence of oil sheen, settleable solids, floatable solids, and odor. Note findings on the checklist.
 - Visually inspect discharge for biological indicators including: emergent vegetation, algae blooms, lack of or stunted vegetation, presence or absence of aquatic life, and fish kills. Note findings on the checklist.

- c) *Chemical Monitoring:* Sample team will sample the dry weather discharge flow for the following parameters, only if visual observations indicate a potential pollutant, illicit discharge, or team otherwise determines a need to sample:
- Samples should be collected from the dry weather discharge outfall, and not the stream.
 - Measure the discharge from the outfall for the following parameters using a probe(s): pH, temperature, and conductivity.
 - Sample the discharge with a colorimeter or test kit for surfactants and total fluoride. Presence of fluoride indicates a treated drinking water source.
- d) *Bacteriological Monitoring:* Collect grab samples for fecal coliform analysis if conductivity or surfactants is high, or if visible signs such as smells, a milky white or gray color, and/or floatables are present, or if other applicable evidence exists for potential sanitary wastewater discharge.
- e) *Extended Chemical Monitoring:* Sample team will collect additional samples for other parameters 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 at Table 1, 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 contaminants most likely to be found, including wastewater, wash water, construction site runoff, and industrial contaminants.

4. Illicit Discharge Source Tracking

- a.) *Drainage Area:* Upon identification of an illicit discharge, staff will review the storm sewer map and determine flow path of the respective storm sewer, to upstream industrial or municipal activities and possible sources within the drainage area.
- b.) *Observation:* Personnel will perform field work, to include 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 look further. Upstream sampling should continue until the source is determined, or efforts result in no detectable discharge.

d.) *Dye Testing*: Continuous discharges may be detected using biodegradable dye packs 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.) *CCTV*: May be used in the event other source identification activities are not effective.

Table 1 Baselines for Sampled 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 likely 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
Surfactants/ 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 levels of sanitary sewage. Could potentially be due to wildlife or residential animals.	Animal waste or sanitary sewage

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	●	⊖	○	⊖	Can change into other nitrogen forms as the flow travels to the outfall
Boron	⊖	⊖	○	N/A	
Chlorine	○	○	○	⊖	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	⊖	⊖	○	⊖	
Conductivity	⊖	⊖	○	⊖	Ineffective in saline waters
Detergents-Surfactants	●	●	○	⊖	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	⊖	○	○	○	24-hour wait period for results. Need to modify standard
Fluoride*	○	○	●	⊖	Reagent is a hazardous waste. Exception for communities that do not fluoridate their tap water
Hardness	⊖	⊖	⊖	⊖	
pH	○	⊖	○	⊖	
Potassium	⊖	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	⊖	⊖	○	⊖	

● 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.

⊖ 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 are not available to assess the utility of this parameter for this purpose,

*Fluoride is a poor indicator h=when used as a single parameter, but when combined with additional parameters

(such as detergents, ammonia and potassium), it can almost always distinguish between sewage and wash water.

5. Quality Assurance/Quality Control (QA/QC) Procedures:

- a.) *Confirmation:* All visual observations must be confirmed by at least two sample team members. Field test must be performed twice if a baseline level is exceeded to confirm positive results.
- b.) *Equipment:* Probe(s) will be used to measure temperature, pH, and conductivity.
- c.) *Probes:* Any probe used to measure temperature, conductivity, and pH 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 bucket should be rinsed twice with flow from 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 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 event 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. FS/HAAF will ensure that Sample Team members will be trained on the procedures described herein prior to performing dry weather screening. FS/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 collecting all dry weather screening data, keeping a copy on site and including a copy 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 Program Manager who will initiate source tracing procedures as described herein.

8. IDDE Program Evaluation:

In order to ensure that the illicit discharge detection and elimination (IDDE) program is effectively removing illicit discharge from the MS4, an analysis of FS/HAAF illicit discharge and detection 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, line televising, field sampling, or inspection). This will allow FS/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.

**Fort Stewart/Hunter Army Airfield
Environmental Prevention & Compliance
Stormwater Management Program**

DRY WEATHER SCREENING LOG

GENERAL INFORMATION

Installation Name: _____
Outfall Number: _____ Date: _____ Time: _____
Location: _____

GPS Coordinates (if NOT mapped) _____

Time since last rain: >72 hrs <72 hrs Quantity of last rain: >0.1 in. <0.1 in.

FLOW ESTIMATION

Flow observed from outfall: yes no

Rate of flow: trickle slow moderate fast

VISUAL OBSERVATIONS

Photo taken: yes no

Odor: none musty sewage rotten eggs sour milk Other _____

Color: colorless grey yellow lt. brown dk. brown Other _____

Clarity: clear cloudy opaque suspended solids

Floatables: none oily sheen foam debris Other _____

Deposits/Stains: none sediments oily Other _____

Emergent vegetation: none normal excessive growth (>50% surface covered)

Bank condition: vegetated concrete rip-rap bare Other _____

Algae growth: none in spots floating on stream bed Other _____

CHEMICAL ANALYSIS

Water temp: _____ °C

pH: _____ S.U.

Surfactants: _____ ppm

Fluoride (total): _____ ppm

Conductivity: _____ umho/cm

Test for fecal Coliform taken: yes no

