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CITY OF HAMPTON

FIELD SCREENING PLAN AND PROCEDURES MANUAL

A. INTRODUCTION

1. **Background:** You are an essential part of a federally mandated program, which will help protect and preserve the quality of the waters in Hampton Roads. Storm water has proven to be a significant cause of degraded water quality. The EPA and the Virginia Water Control Board (SWCB) already have tight control over most known point sources of water quality degradation. Phase 1 localities are required to hold NPDES permits which for the discharge of storm water. In accordance with the current Hampton MS4 permit (VA0088633), Section 1.A.1.b.2 of Permit No. VA00886633 requires:

   "The permittee shall continue the implementation of the current field screening procedures for identifying unauthorized non-storm water discharges and improper disposal into the storm sewer system. Priority shall be placed on segments of the storm sewer system which received drainage from industrial and commercial sources."

2. This document is intended for use as a field guide and contains detailed instructions and sampling procedures. It describes the sampling procedures, schedule, lists the responsibilities of field personnel, and describes QA/QC procedures to be followed. You are not required to memorize this document but rather to use it as a field reference guide.

B. SAFETY PROCEDURES

SAFETY IS ALWAYS THE PARAMOUNT CONSIDERATION: IF YOU HAVE CONCERN THAT A SITUATION IS UNSAFE DO NOT PUT YOURSELF INTO THAT SITUATION.

1. Sampling

Sampling is sometimes conducted in areas where safety hazards exist. Sampling personnel must always be aware of possible hazards and must take the necessary precautions to avoid dangerous situations. Some of the more common hazards are discussed below.

a. Protection from Traffic. If the sample is collected from a manhole in a street, traffic control is an important consideration. In addition to markers, the sampling vehicle should be parked between the working area and oncoming traffic. Personnel should wear orange safety vests when the manhole is located in a vehicular traffic area. Cones and flags should be utilized where appropriate. Under no circumstances should any field personnel enter a manhole.

Samples should be obtained from the manhole as quickly as possible. Sampling crews should replace the manhole cover and move the vehicle and equipment to a location off the street. All sample analyses should be performed in a safe location away from the vehicular traffic area.

b. Confined Space Entry. Manholes and enclosed storm drains are confined spaces and as such must not be entered for any reason without adequate safety precautions. These precautions can only be certified and evaluated by a "Confined Space Qualified Person" with the appropriate monitoring equipment. The project manager and supervisor are "Qualified" and must be consulted for guidance in any confined space situation. Entry includes any time any part of your body breaks the plane of the entry port. **Therefore do not enter or place any part of your body into any manhole.**

c. Removing Manhole Covers. Manhole covers should be carefully removed using the pickaxe provided. Hands and feet should not be used to assist in either opening or closing the manholes. Under no circumstances should any field personnel enter a manhole.

d. Emergencies. Every member of the sampling crew must be aware of procedures to be followed in case of an emergency. All field personnel should have a list of emergency telephone numbers, including the local hospital's general emergency number. All injuries and other problems should receive immediate medical attention and should also be reported as soon as practical to the field supervisor.

e. Hazardous Waste Streams. The storm sewers may receive industrial wastes that contain corrosive or toxic materials. Skin contact with a waste stream must be avoided and long-handled samplers will be provided to each sampling crew. Sampling personnel should always be aware of possible hazards and should take all necessary precautions to insure safety.

f. Other Hazards. A wide variety of insects and rodents may inhabit manholes or sampling sites. Sampling personnel should always be on the lookout for these creatures to avoid painful and dangerous bites or stings.

Sampling personnel are always exposed to the possibility of infections. Disposable rubber gloves should be used to avoid skin contact with the waste stream. Personnel should wash their hands or use the provided towelettes as required. Open cuts or sores should never be allowed to come into contact with a waste stream.

2. Analysis

During sample analysis with the Chemetrics kit, sampling personnel should avoid any internal or external contact with chemicals in the chlorine, copper, and phenol reagents. Skin and eyes may become irritated if exposed to the chemicals. Each member of the sampling team should wear protective safety goggles and disposable rubber gloves while performing the analyses. If exposure does occur, large amounts of water should be used to flush the exposed area.

The analyses should be performed in a well-ventilated area to avoid inhalation of chemical fumes. Specific first aid instructions for each sampling procedure are listed on the materials safety sheets included in the field procedures manual.

3. First Aid

Members of sampling crews should know first aid procedures and, if possible, one person in any sampling group should remain in a safe location during the course of the work. Included in first aid training should be procedures for resuscitation.

Each member of every sampling team should know at least the basics of first aid. A first aid kit will be provided to each sampling team. The field supervisor will carry a portable telephone and should be contacted in the

event of a serious injury.

4. Accident Reports

Reports should be filled out on all accidents regardless of the extent of the injury. In this way, conditions that cause repeated injuries may be isolated and corrected.

C. SCREENING PROCEDURES

1. Preparation for Daily Screening Activities

Each sampling team will begin the day's activities by reviewing the list of screening points to be evaluated. The field supervisor will assign each team a list of sites to be screened each day. A packet of information will be distributed which includes a list of the sampling points, a description of their locations, a map showing their locations, field data sheets, quality control records, chain-of-custody forms, and an equipment checklist. The locations of the points will be marked on the map, and the proposed order of sampling will be established before moving into the field. The description of the screening point, provided by the City of Hampton will be reviewed to determine if any unusual conditions exist at the site and to determine the best way to gain access to the site.

Once the locations of screening points have been clearly established, the screening team will organize their equipment. The equipment checklist should be reviewed and all equipment gathered and inspected to be certain it is in good working order. In particular, the Chemetrics sample analysis kit must be clean, stocked, and fully functional. All equipment in the kit should be intact, complete, and clean.

The pH meter should be conditioned, according to directions in the kit, and checked to make certain the batteries are working. An extra set of batteries should also be carried into the field.

The field supervisor will complete the Weather Conditions Log at the start of each day. This form is presented on Figure 1. The date, duration, and amount of rainfall will be clearly documented. Precipitation gauges located at City of Hampton Operations Yard and the Norfolk airport will be used to obtain precipitation readings. The field supervisor will contact the individual identified at each location to obtain the precipitation information.

This study must be conducted only during dry weather conditions. Dry weather conditions are defined as less than 0.1 inch of rain during the

immediately preceding 48 hour period. If rainfall is received during this 48 hour period then a waiting period is mandatory. No screening will be performed at least 48 hours after the completion of a rainfall event totaling between 0.1 and 1.0 inch. Major storms are defined as precipitation in the form of rain in excess of 1 inch over a 24 hour period. No screening will be performed for 72 hours following a major storm event.

The field supervisor will be responsible for notifying the screening crews of suspension of field screening because of precipitation, and will also notify the screening crews to resume screening.

2. Initial Observations

Figure 2 is a sample Field Data Sheet and should serve as a guide for the tasks required at each sampling site. Identify the sample location as soon as arriving at a site. Record the Map No., the Outfall/Structure No., Date and Time on the top of the Field Data Sheet.

Some initial observations are required in all cases. Complete the General Information section by answering the questions regarding rainfall and identifying the Inspection Team.

Observe and document the physical conditions of the drainage area and stormwater structure being examined by answering the questions under the Field ... Description category. Location is the grid no. in which the site is located. Circle or describe the appropriate type of structure (Open Channel; Manhole; Outfall). Look around or examine the zoning maps in the vicinity from which the structure is expected to receive runoff and describe the dominant land use (Industrial; Commercial; Residential; Unknown or Other(please describe)).

Make observations about the conveyance in which the stormwater is carried. Are their stains on the wall or deposits in the channel? This may indicate past instances of unwanted material or heavy sediment loads from construction activity. Is vegetative growth occurring in the pipe or channel, which could indicate past or future problems? Describe the general structural condition. Is it in good repair or are there indications of deterioration or corrosion?

Determine if flow is present by carefully observing any liquid in the stormwater conveyance. Remember allow the liquid time to stabilize following removal of a manhole. Often when removing the cover dirt or debris is dropped into the water which can produce the false illusion of movement. If flow is observed there is strong indication that an illicit

connection to the stormwater system is present and the City will most likely follow up to identify and correct.

3. Procedures to be Followed When Flow is Observed

When flow is observed at the screening location in the manhole, outfall, or other structure, a grab sample will be taken using the long handled sampler. Visual observations will then be made and logged, the sample will be analyzed, and the resulting data recorded.

The outfall or manhole should be photographed and the film roll and photo numbers recorded. If a Polaroid is used, the identification information should be included directly on the bottom of the photo. Be sure to include the date and time.

If flow is observed, the amount should be estimated using the prescribed method. A sample of the discharge should then be taken. The method used to sample the discharge will depend on the type of structure and its accessibility.

Once the sample is obtained, it should be visually examined and the observations should be noted. The field data sheet lists all the characteristics to be evaluated, including odor, color, turbidity, and floatables. A selection of descriptors is provided. The appropriate ones should be distinctly and clearly circled. If a descriptor other than those provided is appropriate, the blank beside the word "other" should be filled in. All of the characteristics should be addressed; none should be left without a descriptor circled or noted. Any additional remarks should be noted in the space provided under **Comments**.

After visual observations are recorded, the sample should be analyzed using the Chemetrics stormwater sampling kit. The kit should be opened in an accessible area that is free from hazards, dry and out of direct sunlight. The following constituents will be analyzed: chlorine, copper, phenol, detergents, pH, and temperature.

The Chemetrics kit uses colorimetric methods of analysis. The analyses should be performed according to the directions provided, and color comparisons made by using the comparators. The concentrations of the constituents should be recorded on the field data sheet. If the constituent is not detected (the appropriate color change does not occur), then a concentration of zero should be recorded.

The following procedures will be used when testing the samples with the

Chemetrics sampling kit.

a. Glassware Cleaning Procedure

It is important to wash sample containers with Deionized Water, 3 times in succession, after each test procedure is completed. At the end of each day, all sampling and test glassware (except the detergent test equipment) should be washed with detergent and rinsed 3 times in succession. This procedure can best be performed in your laboratory.

To avoid possible detergent test interference, do not use detergent to clean Detergent Test reaction tube, merely rinse 3 times in succession with Deionized Water only.

***WARNING:** Reagents marked with a * are considered hazardous substances. Material Safety Data Sheets (MSDS) are supplied for these reagents. For your safety, read label and accompanying MSDS before using.

b. Total Chlorine

1. Rinse the sample cup with your sample and fill to the **25 mL** mark.
2. Add **5 drops** of the A-2500 activator solution. Stir with the tip of a chlorine CHEMet ampoule and wait **1 minute**.
3. Immerse the CHEMet ampoule in the contents of the sample cup and snap the tip.
4. After **1 minute**, wipe all of the liquid from the exterior of the ampoule and then use the appropriate chlorine comparator to determine the level of chlorine in the sample.

c. Total Phenol

1. Rinse the plastic beaker with your sample and fill to the **25 mL** mark.
2. Stir briefly (5-10 seconds) with the tip of the CHEMet ampoule to dissolve the crystals and snap the tip of the ampoule.
3. Immediately wipe all of the liquid from the exterior of the ampoule and use the appropriate phenols comparator to determine the level of phenols in the sample.

d. Total Copper

1. Rinse the sample cup with your sample and fill to the **25 mL** mark.
2. Immerse a copper CHEMet ampoule in the contents of the sample cup and snap the tip.
3. After **1 minute**, wipe all the liquid from the exterior of the ampoule and then use the appropriate chlorine comparator to determine the level of copper in the sample.

Table 1

Benchmark Concentrations to Identify Industrial Discharges

Indicator Parameter	Benchmark Concentration	Notes
Ammonia	≥ 50 mg/L	Existing "Flow Chart" Parameter Concentrations higher than the Benchmark can identify a few Industrial discharges
Color	≥ 500 Units	Supplemental parameter that Identifies a few specific industrial discharges. Should be refined with local data.
Conductivity	≥ 2,000µS/cm	Identifies a few industrial discharges May be useful to distinguish between industrial sources.
Hardness	≤ 10 mg/L as $CaCO_3$ ≥2,000 mg/L as $CaCO_3$	Identifies a few industrial discharges May be useful to distinguish between industrial sources.
pH	≤ 5	Only captures a few industrial discharges. High pH values may also indicate an industrial discharge but residential wash waters can have a high pH as well.
Potassium	≥ 20 mg/L	Existing "Flow chart" Parameters Excellent indicator of broad range of industrial discharges
Turbidity	> 1.000 NTU	Supplemental parameter that Identifies a few specific industrial discharges. Should be refined with local data.

Note: the above table was taken from the guidance document: “Illicit Discharge Detection and Elimination” by the Center for Watershed Protection; Oct. 2004; pg 134.

e. Detergents

1. Rinse the reaction tube (red cap) with sample and fill to the 5 mL mark.
2. While holding the double tipped ampoule in a vertical position, snap the upper tip using the tip-breaking tool.
3. Invert the ampoule and position the broken end over the µempty into the tube.
4. Cap the reaction tube and shake it vigorously for **30 seconds**. Allow the tube to stand undisturbed for approximately **1 minute**.
5. Make sure that the flexible tubing is firmly attached to the CHEMet ampoule tip.
6. Place the CHEMet assembly (tubing first) into the reaction tube, making sure that the end of the flexible tubing rests on the bottom. Break the tip of the CHEMet ampoule by gently pressing it against the side of the reaction tube.
7. When filling is complete, remove the CHEMet assembly from the reaction tube. Note: The ampoule should draw in fluid only from the organic phase (bottom layer).
8. Invert the ampoule several times, allowing the bubble to travel end to end. Using a tissue remove the flexible tubing from the CHEMet ampoule and wipe all the liquid from the exterior of the ampoule.
9. Place a small white cap firmly onto the tip of the ampoule.
10. Use the detergents comparator to determine the level of detergent in the sample.

f. **pH meter calibration**

To determine which set of standards to use, refer to historical data to find a suitable range in which the sample may give a reading. If historical data is not available, calibrate with pH 4 and 7. If the sample pH reading is outside of the range in which the meter is calibrated, recalibrate the meter to best suit the sample. Manufacturer instructions are provided for meter calibration and sample reading.

h. **Turbidity**

Turbidity in the sample may lead to difficulty in reading colorimetric test results. A 30 cc syringe and 0.45 um disposable filters are included in the kit for filtering the samples, if necessary. The filter is attached to the end of the syringe and the sample is drawn into the syringe through the filter. The filter is removed and the filtered sample is discharged from the syringe into the appropriate sample container.

i. **Repeat Samplings**

When flow is observed at the sampling location two samplings for all the above parameters are required. The first sample set should be collected when the flow is first observed. A second set of samples must be taken and analyzed more than 4 hrs, but not greater than 24 hours later.

D. SAMPLING SCHEDULE

1. Time Estimates

Your project supervisor provides a general estimate of the work to be accomplished based on analysis of the number of sites and their relative locations. The actual time involved will be directly dependent on the number of locations where flow is observed. Assume a large portion of the locations will have flow and require sampling to develop a conservative estimate for total required time.

It is anticipated that an average of 35 minutes will be required for each location where flow is not observed. This includes time to find the access point, record observations, and to proceed to the next location. Where flow is observed, an average of 60 minutes has been estimated. This includes time to find access, collect the sample, perform the required analyses, record observations and results, and to reach the next location.

Your objective should be to do the job correctly, not to do it as fast as you can. As with all field sampling activities, your speed will increase as you gain confidence and familiarity with the program. Notify the field supervisor should you get considerably off schedule. This will assist him in planning the next day's activities and in adjusting sampling attention.

2. Weather Problems

The field screening work is to be conducted during dry weather conditions. Dry weather will be defined as less than 0.1 inch of rain during the immediately preceding 48 hour period. Sampling will not occur for 72 hours after a major storm (defined as more than 1 inch of rain over a 24 hour period). If a rain, drizzle, snow or mist occurs during sampling, the field supervisor must decide whether sampling should be suspended and inform the field crews.

If it rains between the first and second sampling of a location, the first sampling will be repeated so that the second sample can be taken within 4 to 24 hours. Appropriate notations will be made in the field logs. To minimize the number of times this may occur, locations will be resampled on the same day whenever possible. A daily scheduling form has been developed to assist the field crews in allocating time for resampling. This form is discussed later in this section.

3. Tidally Influenced Locations

Up to one third of the screening locations discharge into the intertidal zone and have been identified as being tidally influenced. This means that the locations may be partially or fully submerged with receiving waters. These locations should be scheduled for sampling during low tide. If they are submerged or partially submerged during low tide, the crews will proceed to the alternate point chosen for this location. If the outfall is not submerged and is discharging flow, a sample will be collected and analyzed.

E. SAMPLING CREW RESPONSIBILITIES

It is anticipated that two field crews of two persons each will operate simultaneously to conduct the field screening work. A field supervisor will oversee this field screening work. In addition, a field assistant will be on call.

The responsibilities of the field supervisor include the following:

- Conduct the morning briefing and ensure that all crews understand their assignments.
- Collect the field logs each day, verify that resampling was done as needed (or is scheduled to be done), and check the field logs for completeness.
- Track the locations screened and adjust sampling schedule, if necessary.
- Contact the local weather station and City personnel to postpone sampling, if necessary, because of rain or threatening weather.

- Make decisions on procedures as requested by the field crews.

- Check that sampling crews are following proper sampling and QC procedures.

- Handle any problems that may arise.

The field crews are responsible for following the procedures described in this manual, for completing all information called for in the field data logs, and for notifying the field supervisor of any problems encountered.

F. QA/QC PROCEDURES

The quality control procedures to be used on this project are listed below.

- One person in each crew will fill out the log sheets. Before leaving the screening location, the other crewmember will check the sheet for completeness, verify the location information, and initial the form.

- If testing results in any values that are cause for concern, a retest of that constituent will be conducted immediately. If the second test shows substantially different results, a third test will be done. All results will be recorded. The specified ranges for the measured parameters, which are cause for concern, are listed below and are based on the concentration ranges available in CHEMetrics test kits:

  Total Copper > 3 mg/L
  Total Phenol > 10 mg/L
  Detergents > 3 mg/L

  A sample is required for laboratory verification if the second test verifies the first test, or, if the third test still shows values, which we have identified as cause for concern. Collect a sample in the specially marked 500 ml nalgene container, place the container on ice, and call HRSD's Technical Services Division (Danny Barker 460-4247 or Jamie Heisig-Mitchell 460-4258) for further direction. These samples will have to be transported to the District Lab before the end of the work day (3:30 pm) so that analysis can be conducted on the sample within the prescribed holding time for the intended parameters.

- Duplicate analyses will be run routinely on 10 percent of the samples. For these duplicate analyses the crewmembers will switch roles and conduct the analyses

normally performed by the other person. Each crew will complete a Quality Control Record (presented in Figure 3).

- At least 10 percent of sample collected by each crew will be split and one part will be analyzed in the field and the other will be sent to the lab for analysis. Included in this 10% calculation are any causes for concern verifications. The chain of Custody Record for the laboratory samples is presented in Figure 5. The samples for the laboratory must be kept in a cooler on ice.

- The field supervisor will routinely check the sampling procedures of each field crew.

- The field supervisor will check the field logs each day to ensure that they are being filled out completely and that resampling is occurring as required, and that duplicate analyses are conducted as required.

G. Searching for Illicit Discharges Problems in the Field. *

The paragraph provides basic information about investigation work needed to track down individual sources of illicit discharges once screening work has been completed and screening results have exceeded benchmark concentrations (See Table 1).

Storm drain network investigations

Storm drain or "trunk" investigations narrow the source of a discharge problem to a single segment of a storm sewer. The investigation starts at the sample point. For the parameters Copper, Phenol, Chlorine and Detergents follow the previously described **QA/QC Procedures**. For pH exceeding beyond those listed in Table 1, the sampling crew must recalibrate the pH meter, and retest the screening point. If values continue to exceed the given parameters the sampling crew must decide how it will explore the upstream pipe network from the screening point. The three options include:

• Work progressively up the trunk from the outfall and test manholes along the way

• Split the trunk into equal segments and test manholes at strategic points of the storm drain system

• Work progressively down the trunk (i.e., from the headwaters of the storm drain network and move downstream)

The decision to move up, split, or move down the trunk depends on the drainage system and the surrounding land use. The three options also require different levels of advance preparation. When testing results in abnormal pH values the sampling crew can begin the pipe network investigation immediately, using a map

of the storm drain system. More preparation may be necessary for chemicals exceeding the above listed values. The sampling team should examine the storm drain system and find the most strategic manholes to sample.

Once crews choose one of these options, the team should select the most appropriate investigative methods to map the area of exceedance.

Drainage area investigations

Drainage area investigations will begin in the office once an exceedance map has been developed. It will involve a parcel by parcel analysis of potential generating sites within the drainage area of a problem area. They are most appropriate when the drainage area is large or complex, and when the flow type in the discharge appears to be specific to a certain type of land use or generating site. These investigations may include the following techniques:

- Land use investigations
- SIC code review & DEQ industrial permit lists
- Permit review
- As-built review
- Aerial photography analysis
- Infrared aerial photography analysis
- Property ownership certification
- Visual inspection at manholes
- Dye testing
- Smoke testing
- Video testing

On-site investigations

Once the illicit discharge has been isolated to a specific section of storm drain, an onsite investigation can be performed to find the specific source of the discharge. The investigation team should include the Storm Water Manager, the Fire Departments Environmental Crimes Investigator and the Public Works Drainage Maintenance Department. The Hampton Roads Sanitation District may be called upon for further laboratory analysis work. In some situations, such as subwatersheds dominated by industrial land uses or many generating sites, on-site investigations may be immediately pursued. On-site investigations may perform dye testing on the plumbing systems of the buildings. Where septic systems are prevalent, inspections of tanks and drain fields may be needed. On-site investigations are excellent opportunities to combine Industrial Discharge Detection and Elimination efforts with industrial site inspections that target review and verification of proper Storm Water Pollution Prevention Plans

Fixing Illicit Discharges

Once the source of an illicit discharge has been identified, steps should be taken to fix or eliminate the discharge. Four questions should be answered for each individual illicit discharge to determine how to proceed; the answers will usually vary depending on the source of the discharge.

- Who is responsible?
- What methods will be used to repair?
- How long will the repair take?
- How will removal be confirmed?

Financial responsibility for source removal will typically fall on property owners and/or the MS4 operators. Methods for removing illicit discharges usually involve a combination of education and enforcement. The Hampton City Attorney's office should be called upon for advice in determining proper enforcement measures. The Storm Water Manager should use judgment in exercising the right mix of compliance assistance and enforcement. The authority and responsibility for correction and enforcement is clearly defined in the Hampton City Code, Section 33.1-12.1-12.3. An escalating enforcement approach is often warranted and is usually a reasonable process to follow. Voluntary compliance should be used for first-time, minor offenders. Often, property owners are not even aware of a problem, and are willing to fix it when educated. More serious violations or continued non-compliance may warrant a more aggressive, enforcement oriented approach. For reference, the City of Hampton Department of Public Works Industrial Inspection Policy Manual and the Hazardous Materials Compliance Inspections and Environmental Crimes Investigations Plan are available for review in the MS4 Program Plan manual.

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Note: See the publication: "Illicit Discharge Detection and Elimination" by the Center for Watershed Protection; Oct. 2004, chapters 7-14.

Figure 1

Hampton NPDES Stormwater Permit
Weather Conditions Log

Date _____ Time _____ Field Supervisor

I. Weather Conditions:

A. If rainfall was less than 0.1 inch for the previous 48-hour period, ***dry weather conditions*** exist, and sampling may proceed.

B. If rainfall was more than 0.1 inch for the previous 48-hour period but less than 1 inch for a 24-hour period, a ***rainfall event*** has taken place and 48 hours must elapse prior to continuance of sampling.

C. If rainfall was more than 1 inch for a 24-hour period, a ***storm event*** has taken place and 72 hours must elapse prior to sampling.

II. Document current weather conditions and antecedent weather conditions. The previous 24-hour to 48-hour time frame is critical for determining if sampling will be conducted.

A. Rainfall: Document rainfall data from the two locations identified for use in the Portsmouth sampling events.

	Amount (inches)	Period (hours)	Start	Ending
Wakefield National Weather Service 1-757-899-4200				
Hampton Weather Service http://members.cox.net/wxr/				

B. Discussion

Figure 3

Hampton NPDES Stormwater Permit
Quality Control Record

Date: _____ Map No. _____

Time: _____ Structure No._____

Sampling Team:_____ Grid Cell No. _____

A. Split Sample: The sample will be collected and split into two portions. One-half of the sample will be field analyzed and one half will be sent to the laboratory for analysis. The samples for the laboratory must be kept in a cooler on ice.

Results of field analysis: Results of lab analyses:

Copper ____ mg/L Copper ____ mg/L

Phenol ____ mg/L Phenol ____ mg/L

Chlorine ____mg/L

Detergents ____ mg/L Detergents ____ mg/L

PH ____

Copy of chain-of-custody attached

Date of laboratory analysis

B. Duplicate Analysis: Each crewmember will switch roles and will conduct the analyses normally conducted by the other crewmember.

Results of field analysis I: Results of field analyses II:

Copper ____ mg/L Copper ____ mg/L

Phenol ____ mg/L Phenol ____ mg/L

Chlorine ____mg/L Chlorine ____ mg/L

Detergents ____ mg/L Detergents ____ mg/L

pH ____ pH

Note: Write NA in the blanks that are not applicable.

H. EQUIPMENT LIST

The following equipment will be provided to each field sampling team for site investigations.

1. CHEMetrics Storm Drain Kit
2. Measuring Device(s) (ex. Tape measure, yard stick)
3. Distilled Water
4. Squeeze Bottle
5. Clipboard
6. Kimwipes (lg)
7. Beaker (50 ml)
8. PH meter w/ pH and temperature probe
9. Sample Containers, plastic (500 ml)
10. Safety Glasses
11. Gloves, latex (disposable)
12. Flashlight
13. First Aid Kit w/ eye wash
14. Safety Cones (18 in.)
15. Sample Dippers (2) w/ extendable handles
16. Safety Vests, orange
17. Camera
18. Manhole pick
19. Stop Watch
20. Chemical Waste Container, plastic (1000 ml)
21. Refractometer
22. Cooler with ice